
Appendix J
Wildland Fire Management Plan

Appendix J: Wildland Fire Management Plan

Air Force Instruction 32-7064 requires that installations with unimproved lands that present a wildfire hazard, and installations which utilize prescribed burns as a land management tool, will develop and implement a Wildland Fire Management Plan (WFMP). The WFMP will be incorporated into or consistent with the INRMP as a component plan, and is included in this appendix.

NOTE: The Wildland Fire Management Plan is currently under review.

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45th SPACE WING



"Control of the Battlefield Begins Here"

WILDLAND FIRE MANAGEMENT PLAN

July 2014

FOR OFFICIAL USE ONLY

45th SPACE WING WILDLAND FIRE MANAGEMENT PLAN

2014

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1.0 Introduction

Wildland fires¹ are defined as fires that occur in natural, undeveloped land as either a naturally ignited wildfire, an inadvertently ignited wildfire or an intentionally ignited prescribed or controlled burn. Numerous federal programs, policies, guidance documents and working groups have been established to ensure the adequate management of wildland² fires on federal lands. Further, the US Air Force (USAF) has adopted and incorporated these standards into its wildland fire management program as described in Air Force Instruction (AFI) 32-7064, Integrated Natural Resource Management, Chapter 12, Wildland Fire Management. The AFI directs installations with unimproved lands that present a wildfire hazard, and installations which utilize prescribed burning as a land management tool, to develop and implement a Wildland Fire Management Plan (WFMP).

Since the majority of 45 Space Wing (45 SW) lands are located in central Florida, which is believed to be the lightning strike capital of the world, the potential for a lightning ignited wildfire is significant. The 45 SW installations with unimproved land that present a wildfire hazard include Cape Canaveral Air Force Station (CCAFS), Patrick Air Force Base (PAFB), the Malabar Transmitter Annex (MTA), and the Jonathan Dickinson Missile Tracking Annex (JDMTA). In addition, the 45 CES/CEIE-C conducts prescribed burns on CCAFS for habitat enhancement and fuel load reduction.

The 45 SW WFMP is required to describe and document prescribed burn activities and establish procedures for responding to wildfire situations in a manner that fulfills the goals of the WFMP and various federal regulations and policies. The purpose of the 45 SW WFMP is to establish a level of fire management that reduces threat to 45 SW personnel, assets, forests and other related at-risk wildland resources (wildlife), while supporting the 45 SW mission and promoting natural resource management through the use of prescribed fire. The 45 SW wildland fire management program will support the mission of the 45 SW in the following ways:

- Reduce fuel loads,
- Minimize the potential for a catastrophic wildfire,
- Identify critical facilities requiring fire/smoke protection,
- Enhance the health/condition of installation vegetative communities,
- Support conservation efforts for the Florida Scrub-jay (*Aphelocoma coerulescens*) and other federally listed threatened and endangered species,
- Improve habitat for scrub-dependant species, and
- Comply with the U. S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) for Florida Scrub-jay conservation on CCAFS (Appendix K, Attachments K-2-4, 2-5, and 2-6), and the Florida Scrub-jay Operational Management Plan (Appendix D, Attachment D-2).

The 45 SW WFMP will:

- Describe the goals and objectives of the wildland fire program,
- Explain procedures that will be implemented to control wildfires,
- Describe the 45 SW prescribed burn program and other possible wildland fire scenario's,
- Describe smoke management techniques,
- Describe the organizational structure and chain of command for the various wildland fire scenarios at each installation,
- Describe forest and fuel load conditions,
- List fire response personnel, Chain-of-Command, equipment and training,
- Show all interagency cooperative agreements, and
- Describe safety concerns associated with all types of wildland fire situations and actions taken to minimize risk.

¹ The term *Wildland Fire* is used when wildfire and prescribed fire are referred to collectively.

² A *wildland* is an area with little to no development, except for roads, railroads, powerlines, and similar transportation facilities. Structures, if any, are widely scattered.

2.0 Goals and Objectives

The primary goal of the 45 SW wildland fire management program is to support the USAF's mission by reducing the risk for wildfire for the purpose of protecting military personnel and civilians as well as valuable Department of Defense (DoD) natural and man-made resources. The development and implementation of this WFMP support the ecosystem management goals and objectives identified in the 45 SW Integrated Natural Resources Management Plan (INRMP). The WFMP describes the goals of the 45 SW prescribed burning program and how it relates to resource protection and conservation of USAF lands.

The Wildland Fire Management Program's goals and associated objectives are described below. These include both goals associated with wildland fire response/management and the prescribed burning program.

Goal 1 – Support the mission of the 45 SW by minimizing the wildland fire potential and severity on all 45 SW installations.

- **Objective 1.1** - Reduce the amount of vegetative fuels on CCAFS by conducting prescribed fires or mechanical vegetation clearance on an average of 300 acres of wildlands per year.
- **Objective 1.2** - Maintain the existing network of firebreaks at all 45 SW installations and create new firebreaks as required.
- **Objective 1.3** – Maintain prescribed burn compartment maps that show firebreaks, critical facilities, previously burned compartments (reduced fuel load) and any other wildfire control issues for each 45 SW installation.
- **Objective 1.4** – Minimize potential for a catastrophic wildfire by scheduling prescribed burning of compartments known to contain high fuel loads.

Goal 2 – Manage wildland fires on 45 SW land in a manner that protects the lives of firefighters, installation personnel, and the general public.

- **Objective 2.1** – Have no injuries, deaths, property loss, or road closures due to wildland smoke or fire.
- **Objective 2.2** – Maintain wildland fire qualifications/certifications for all firefighters and fire managers and ensure all personnel assigned to those positions are trained to the level required for their expected duties.
- **Objective 2.3** – Ensure all Fire Chiefs, On-Scene Commanders, prescribed burn bosses, firefighters, and prescribed burn personnel focus on providing the ultimate level of personnel safety protection while engaged in any type of wildfire operation, uncontrolled wildland fire, controlled prescribed fire, etc.
- **Objective 2.3** – Establish and maintain a personnel/installation-wide warning system with procedures to alert and/or inform 45 SW personnel, tenants, contractors, etc., of a wildfire and/or scheduled prescribed burn on each 45 SW installation.
- **Objective 2.4** – Provide adequate smoke management during wildland fires to minimize, if not preclude, potential public safety issues (i.e., visibility, driving impairment, breathing, etc.) associated with the fire.

- **Objective 2.5** – Implement formal procedures and conduct safety briefings for all personnel involved in a prescribed burn prior to igniting and/or initiating a prescribed fire.

Goal 3 – Enhance 45 SW capability for utilizing inadvertently ignited wildfires for fulfilling the goals of a prescribed fire

- **Objective 3.1** – Establish and implement a procedure for analyzing a wildland fire scenario whereby a wildfire could be allowed to burn without jeopardizing personnel or 45 SW resources.
- **Objective 3.2** – Develop a checklist that can be used in conjunction with facility, infrastructure, and burn compartment maps to quickly determine critical aspects of a wildfire situation to facilitate rapid decisions regarding fires within the established compartment boundary.
- **Objective 3.3** – Develop a Memorandum of Agreement (MOA) between the USFWS on the Merritt Island National Wildlife Refuge (MINWR) and the 45 SW for prescribed fire support and wildfire response as applicable.

Goal 4 - Improve security visibility to enhance protection of 45 SW facilities and personnel.

- **Objective 4.1** – Use prescribed fires to reduce the height and density of vegetation to minimize areas that can be used for concealment purposes.
- **Objective 4.2** – Maintain firebreaks, utility corridors, lines of sight, road shoulders, rights-of-way, etc., used to delineate prescribed burn compartments that are co-utilized as security clear zones.

Goal 5 – Support the Goals of the INRMP by protecting and improving the vegetative communities and wildlife habitat on the 45 SW installations.

- **Objective 5.1** – Utilize prescribed fire for the purpose of maintaining the natural, fire-dependant barrier island ecosystem on CCAFS.
- **Objective 5.2** – Implement prescribed burns in forested areas to remove dead and dying vegetation, inhibit the growth and spread of exotic and/or invasive plant species, promote new plant growth (regeneration), create open areas within scrub forests and facilitate species diversification/biodiversity.
- **Objective 5.3** – Conduct periodic Controlled Burn Working Group meetings to coordinate and disseminate fire information, facilitate prescribed burn approval, resolve conflicts, and support the other goals of the WFMP.
- **Objective 5.4** – Ensure prescribed burns and wildfire response activities comply with all USFWS Biological Opinions that have been issued for the 45 SW and that coordination with federal, state and local agencies as well as 45 SW personnel/tenants is conducted as appropriate.
- **Objective 5.5** – Analyze and coordinate wildland fire response to determine if a wildfire can be safely controlled and managed as a prescribed fire.
- **Objective 5.6** – Avoid prescribed burn activity during the Florida Scrub-jay nesting season (March 1 – June 30)

3.0 Description of 45 SW Wildlands

The 45 SW is comprised of a number of installations within the continental United States (CONUS) and some Geographically Separated Units (GSUs) outside the continental United States (US). The 45 SW WFMP focuses on those installations with unimproved lands that present a wildfire hazard (e.g., wildlands), which include CCAFS, PAFB, MTA, and JDMTA. A description of the vegetative communities currently found on these properties is summarized in the following sections.

The flora of an area is a basic component of its biological diversity and an important consideration for environmental planning, including prescribed fires and impact assessment. Detailed information of the various vegetative communities found on the 45 SW installations is found in INRMP Appendix Q, Natural Communities. In addition, the following plans have been developed and incorporated into the INRMP in an effort to protect and sustain the viability of the unique vegetative communities found on these installations:

- Florida Scrub-jay Management Plan (INRMP Appendix C-2);
- Scrub Habitat Restoration Plan (INRMP Appendix C-4);
- Wildland Fire Management Plan (INRMP Appendix J);
- Landscaping and Grounds Management Plan (INRMP Appendix H); and
- Invasive Species Management Plan (INRMP Appendix G)

3.1 Cape Canaveral Air Force Station

3.1.1 Vegetative Communities

The 15,800-acre CCAFS is composed of potentially 15 natural communities, as defined by the *Guide to the Natural Communities of Florida* (Florida Natural Areas Inventory and Florida Department of Natural Resources 2010, and Gullette et al. 2009) These communities are:

- Beach Dune
- Coastal Grassland
- Coastal Strand
- Coastal Interdunal Swale
- Maritime Hammock
- Xeric Hammock
- Scrub
- Hydric Hammock
- Estuarine Tidal Swamp/Marsh
- Shell Mound
- Basin Marsh
- Live Oak/Saw Palmetto Hammock
- Live Oak/Saw Palmetto Shrubland
- Tropical Hammock
- Mangrove or Exotics

The occurrence and distribution of these natural communities on CCAFS is the result of a complex geological history. Limestone bedrock formation, fluctuating sea levels related to glacial advance and retreat, and more recent coastal processes of erosion and deposition have all shaped the geology and physiography of the Canaveral Peninsula. These factors in combination with current climatic trends and human activity determine the type and extent of natural community occurrences on CCAFS. Generally, older communities are found on the westward margin of the Canaveral Peninsula, along the Banana River; newer and successional communities are forming along the eastern coast. The communities are described below in the order of the zones they occupy, east to west. Brief fire management strategies for the vegetative communities are also noted in the following sections.

3.1.1.1 Coastal Dune, Grassland, Strand and Interdunal

Of all the community types on CCAFS, coastal dune, grassland and strand receives the most direct influence from coastal processes such as erosion and deposition. Sections of this community type on CCAFS are subject to frequent natural disturbances from storms and overwash. Dunes are highly unstable and dynamic communities. Two sections of beach on CCAFS are accreting sand. False Cape at the north end of the installation has had a net increase of approximately 0.1 mile since 1847. The entire barrier island of Cape Canaveral is also accreting sand as demonstrated by several parallel lines of relic dunes and offshore sand bars (Johnson and Barbour 1990).

Where the dunes are low or dissected, and storm overwash is frequent, coastal grassland has developed in flat areas directly behind the dunes. In higher or more stable areas beach dune may grade directly into shrub dominated coastal strand.

3.1.1.2 Maritime Hammock

Given the density of canopy cover, lack of herb species, and depth of moist leaf litter, it is unlikely that natural fire played a significant role in maritime forests in the past. Salt spray is a limiting factor in the vertical development of maritime hammock. Dominant tree species of maritime hammock are relatively fire-adapted. Live oak (*Quercus virginiana*) is protected from scorching by its thick, ridged bark. Sabal palm (*Sabal palmetto*) is protected by thick petiole bases, which sheath the trunk and also protect the apical meristem. Red bay (*Persea borbonia*) and saw palmetto (*Serenoa repens*) readily re-sprout after a fire.

3.1.1.3 Xeric Hammock

Xeric hammocks are difficult to ignite directly and usually burn only when adjacent pyrogenic communities carry fire into them (Myers and Ewel 1990). As a result, the nature of adjacent communities influences the type and frequency of fire in scrub and xeric hammock. Xeric hammocks on CCAFS are interspersed with numerous hydric swales. The presence of these wet communities probably acted as a seasonal barrier to the spread of fire. Studies have shown that burning does not lead to a change in species composition and dominance in scrub; re-vegetation occurs as a result of root sprouting, which proceeds quickly and prevents establishment of new species (Schmalzer and Hinkle 1987 and 1992). It is unlikely that burning will convert xeric hammock to a typical oak-species scrub. If a secondary goal of prescribed fire is to restore it to its original condition, it is recommended that fire be introduced to xeric hammocks with return intervals greater than 20-25 years. Restoration of natural hydrology at CCAFS by plugging and filling canals and ditches will also facilitate a more natural fire regime in xeric hammock.

3.1.1.4 Scrub

Scrub communities on CCAFS have undergone years of fire suppression; as a result, scrub on CCAFS is overgrown and plant species diversity is low. Although it does not burn frequently, scrub is essentially a fire-maintained community, with hot, intense fires occurring every 20 to 40 years (FNAI 2010). A more recent estimate of the natural fire cycle to maintain optimal scrub habitat is 6.5 years. A 6.5 year re-burning cycle is the goal of the 45 SW at CCAFS. The nature of fuels in scrub, especially highly flammable palmetto (*Sabal* spp.), ensures that when fires occur, they are catastrophic. When fires are this hot, they can completely remove the vegetation and sterilize the soil in large areas, creating openings that support many important scrub species. As fire is re-introduced and openings in the scrub are created, species diversity in this community will increase. A prescribed fire plan that brings a 'natural' fire cycle back to the scrub community will eliminate plant composition shading, low reproduction and species diversity problems. Quantitative studies of the effect of fire on species composition and community structure in scrub should continue to provide data to access prescribed fire success.

3.1.1.5 Hydric Hammock

Fire is not a management issue in hydric hammocks because soils are usually saturated and ground cover is not substantial enough to carry fire. It is strongly recommended that all heavy equipment/mechanical clearing and disturbance be excluded from hydric hammocks to prevent further encroachment by invasive species. Management of the devastating invasive Brazilian pepper should be

controlled by manual removal or spot treatments with herbicides to prevent thickets from becoming a monoculture understory.

3.1.1.6 Estuarine Tidal Marsh and Swamp, Mangrove

Fire is not a management issue in tidal swamps and marshes as these community types occur in flat areas where the soil is always saturated with brackish water. Fire is not an issue in mangrove communities as mangroves grow in water.

3.1.1.7 Shell Mound

Shell mounds are composed entirely of shell material, although tropical plant species will often grow on the mounds. These plant species are typically affected by freezing temperatures. (FNAI 2010) There are no known studies of fire effects on shell mounds, but it is anticipated that the shell mound community would not be affected by fire.

3.1.1.8 Basin Marsh

During the dry season, natural fires probably occasionally burned basin marshes, and dense sawgrass and maidencane will burn when water is present in the marsh. The natural fire frequency varies dependent upon the hydrology of the marsh. There are few studies to indicate the natural fire interval for a basin marsh, except for glades marshes with intervals of five to seven years. (FNAI 2010)

3.1.1.9 Live Oak/Saw Palmetto Hammock/Shrubland

The live oak/saw palmetto hammock association is an upland forest type with low species diversity intermediate between a maritime hammock and a xeric hammock. The live oak/saw palmetto shrubland association is also an upland forest type. These community types do not fit easily into the FNAI 2010 natural community categories, and could be the result of long term fire exclusion. (Gulledge et al. 2009) If these communities have a significant number of the highly flammable cabbage palm, a fire can be catastrophic by completely removing the vegetation and sterilizing the soil.

3.1.1.10 Tropical Hammock

In a natural system, fire often extinguishes near the edge of a tropical hammock when it encounters the hammock's moist climate and litter layer. However, a tropical hammock community is susceptible to damage from fire during periods of extreme drought or when the water table is lowered. (FNAI 2010)

3.2 Patrick Air Force Base

3.2.1 Vegetative Communities

The 1943 Indian River land cover map developed by St Johns River Water Management District depicts the area where PAFB is located today as being composed primarily of scrub habitat. The west shoreline was vegetated with flatwoods, disturbed estuarine wetlands, and salt marsh. The Banana River shoreline is generally disturbed but some natural sand beach, wetland/salt bush and mangrove plant communities do exist in patchy distribution. The primary land use at PAFB is urban.

The majority of the vegetation on the approximately 2,002-acre PAFB consists of turf and landscaped areas. Herbaceous vegetation represents over 40% of the land area within PAFB and is the dominant vegetation type. Mowed grass, sparse, and dense herbaceous vegetation surrounds developed areas (i.e., golf course and facilities), roadways, and the airfield. The beach and associated dune vegetation comprise approximately 3-4% of the base land area. This is the most extensive natural community found on PAFB and is composed of mostly native vegetation. Disturbed shrub and exotic species are the second most abundant types of vegetation on PAFB. The presence of these shrubs and other non-native vegetation indicate that most of these areas have at one time been severely disturbed. Disturbance facilitates the spread of invasive species and exotics now cover approximately 20% of the non-developed areas on base. Mangroves grow along the Banana River all along PAFB's western boundary, but in patchy distribution. These mangroves provide little ecological value because of their small areas and

sparse distribution. Mangroves are indigenous to the Florida coast and are protected under Florida statutes because of their valuable contribution to erosion control, improved water quality, and habitat use.

Cabbage palms, the state tree of Florida, appear throughout PAFB and act as vertical accents beside walkways and buildings. Many palms occur along State Road (SR) A1A and are also used sparingly as a landscape buffer between land uses.

The beach dune and Banana River shoreline represent the two primary native vegetative communities on PAFB. In an effort to assess the characteristics of the beach dune community at PAFB, a comprehensive dune survey was conducted that identified the presence and distribution of native vegetative plants on the beach dune.

Dunes on PAFB constitute a narrow strip of vegetation bordered by the Atlantic Ocean, SR A1A, base housing, or areas of mowed grass. Major hurricanes have significantly affected beach dune erosion. The flora of the remaining dunes includes four major elements:

1. Common dune or coastal strand species such as sea oats (*Uniola paniculata*) bitter panicum (*Panicum amarum*), beach sunflower (*Helianthus debilis*), Spanish bayonet (*Yucca aloifolia*), sea grape (*Coccoloba uvifera*), and railroad vine (*Ipomoea pes-caprae*)
2. Less common, state-listed dune species such as beach star (*Remirea maritima*), inkberry (*Scaevola plumieri*), prickly pear cactus (*Opuntia stricta*), and spider lily (*Hymenocallis latifolia*)
3. Native species of disturbed or open areas such as ragweed (*Ambrosia artemisiifolia*), beggar-ticks (*Bidens pilosa*), and southern crabgrass (*Digitaria ciliaris*); and
4. Introduced species such as sow thistle (*Sonchus asper*) and *Vitex trigolia*.

Several floral species found on PAFB are considered Florida Exotic Pest Plant Council (FLEPPC) Category I invasive exotic plants. These are species that are widespread in Florida and have an established potential to invade and disrupt native plant communities. Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina equisetifolia*), melaleuca (*Melaleuca quinquenervia*) hydrilla (*Hydrilla verticillata*), cogon grass (*Imperata cylindrical*) and torpedo grass (*Panicum repens*) are in this class. Brazilian pepper, Australian pine, and cogon grass are common on the Waste Study Site/Closed Landfill #5 and the Small Arms Firing Range berms. The invasive species found on PAFB have a high salt tolerance and can replace native coastal shrubs very rapidly.

3.3 Malabar Transmitter Annex

3.3.1 Vegetative Communities

The 640-acre MTA was originally developed during World War II as an auxiliary airfield. Historic photos indicate that a large portion of the MTA was clear cut prior to 1960. An extensive drainage system of canals, ditches, and swales was installed to control surface water. Four natural communities occur within MTA (Schultz and Knight 1997):

- Depression Marsh;
- Hydric Hammock;
- Mesic Flatwoods; and
- Wet Flatwoods.

A baseline biological survey conducted within MTA in 2014 (VZ Technologies et al. 2014), which documented the following natural land cover areas, based on the Florida Land Use, Cover and Forms Classification System (FLUCFCS); FLUCFCS is in parentheses:

- Mixed rangeland (code 330)
- Pine flatwoods (code 411)
- Cabbage palm hammock (code 428)
- Streams and waterways (code 510)
- Hydric pine flatwoods (code 625)

MTA encompasses approximately one square mile (640 acres) and is completely surrounded by residential development. Approximately 120 acres in the center of the installation are covered by buildings, the paved airfield, and roads. Another 250 acres are regularly mowed around the antenna structures, in the cleared lines-of-site, and along roads that run through woods. The remaining 250 acres consist of unimproved grounds, predominantly mesic flatwoods. The natural areas are mainly restricted to the periphery of MTA and all have been disturbed to some degree.

Today, the natural communities on MTA are not of high quality due to extensive development. Alterations include direct disturbances such as airfield pavement, mowed antenna fields, roads, structures, and military exercises. Indirect disturbances include the suppression of the natural fire regime and the modification of the hydrology. A wildfire at MTA occurred in June 2003 and roughly 150 acres burned. It was determined that it was an accidental wildfire caused by juveniles. The fire began outside of the MTA fence and then jumped onto MTA property. This wildfire spurred the issue of fuel load and safety for the adjacent communities that surround MTA. A prescribed fire on 6 December 2005 was conducted that burned approximately 100 acres. A wildfire was started around 2010 in the southwestern portion, reportedly started by juveniles. While wildfires are a concern for the MTA given the type of vegetation on-site and surrounding land use, there are no current plans to use prescribed fire at MTA due to various constraints (e.g., local smoke concerns, funding).

Populations of invasive exotic plants are located on MTA in various locations. Similar to other 45 SW installations in Florida, the most prominent exotic species is Brazilian pepper. In disturbed areas, it is widespread and has become a dominant species along the southern border. Australian pine (*Casuarina glauca*) occurs in two locations in the northwest quarter of the installation. The first clump is a narrow 150 feet long band along the canal on the west border and the second is a 50-foot long band along a nearby east-west grassy road. A small patch of cogon grass (*Imperata cylindrica*) is located at the northwest end of the old runway. Melaleuca grows as two small clumps of trees at opposite ends of a depression marsh in the southeast quarter of the base. Strawberry guava (*Psidium cattleianum*) occurs as one plant about half way between the melaleuca clumps. The closely related common guava (*Psidium guajava*) is abundant along the edges of the northeast-southwest runway. Camphor tree (*Cinnamomum camphora*) occurs as a few isolated individuals. Earpod tree (*Enterolobium contortisiliquum*) occurs on the eastern side of the south end of the northeast-southwest runway.

3.4 Jonathan Dickinson Missile Tracking Annex

Three tropical shrub species are present in the maritime hammock at the north boundary. North of the perimeter security fence are abundant twinberry (*Myrcianthes fragrans*), common wild coffee (*Psychotria nervosa*), and one plant of wild lime. Inside the northwest corner of the installation's perimeter fence are a few twinberry and wild coffee plants. These plants are located amongst live oaks on a low ridge.

3.4.1 Vegetative Communities

The 11-acre JDMTA is surrounded on three sides by the 11,383-acre Jonathan Dickinson State Park located in southern Martin County. JDMTA was constructed on Park land leased by the 45 SW from the State of Florida. The entire area is an example of an extensive xeric upland dominated by sand pine and scrub oak, mesic to dry flatwoods (dominated by South Florida slash pine [*Pinus elliotti* var *densa*]), and forested/herbaceous wetlands. JDMTA is predominately developed land for the military mission. The primary vegetation found on JDMTA is associated with four discontinuous scrub "islands". These areas are vegetated primarily by the following dominant plants: scrub oak (*Quercus inopina*); sand live oak (*Q. geminata*); sand pine (*Pinus clausa*); Florida rosemary (*Ceratiola ericoides*); saw palmetto (*Serenoa repens*); and wild blueberry (*Vaccinium* spp.) (Wunderlin 1982).

3.5 Rare Flora on 45 SW Installations

Federal status as a threatened or endangered species is derived from the ESA (16 USC §1531 *et seq.*) and is administered by USFWS. A current list of federally endangered and threatened species, candidate

species, and species of concern is maintained by UFWFS. Candidate species and species of concern designated by USFWS receive no statutory protection under the ESA. Florida Department of Agriculture and Consumer Services (FDACS) Division of Plant Industry administers and maintains a list of endangered, threatened, and commercially exploited plants in accordance with chapter 5B-40, FAC. FNAI maintains a list of species and natural communities documented by location. However, it should be noted that the FNAI database is not a comprehensive list as it is dependent on reported occurrences.

No federally listed threatened and endangered plants are known to occur on CCAFS, PAFB, and MTA; state protected species have been observed within these 45 SW properties.

In 1997 a rare plant survey was completed for MTA (FNAI 1997). Suitable habitat for most rare plants on MTA is not available due to the lack of burning in fire-adapted natural communities, widespread drainage, land clearing, and other disturbances. Only one rare plant species had been observed on MTA. A small but healthy population of the epiphytic hand fern (*Cheiroglossa palmate*) was growing on cabbage palms in three locations. This plant is listed as endangered by the state of Florida, but is not federally listed. This plant was located within the cabbage palm hammock in the flatwoods that are found along the southern edge of MTA. Surveys conducted after hurricanes indicate that the hand fern population was destroyed; however, a survey conducted in 2014 observed the hand fern again, growing on cabbage palms (VZ Technologies et al. 2014).

One federally listed (Endangered) lichen species has been observed within JDMTA: Perforate reindeer lichen (*Cladonia perforata*). It was relocated to the adjacent Jonathan Dickinson State Park when the boresight tower was constructed. It is possible fragments of this protected species have re-established in JDMTA due to wind dispersal.

Table J-1 provides a list of protected plants that are found on 45 SW properties, and the plant status.

Although mangrove species are not state or federally listed plant species (and are not included in Table J-1), state law affords some protection to the black mangrove (*Avicennia germinans*), red mangrove (*Rhizophora mangle*), and white mangrove (*Laguncularia racemosa*), which occur along the Banana River shoreline and the edges of some canals within CCAFS and PAFB. Mangroves are protected by the Florida Mangrove Trimming and Preservation Act (Section 403.9321 *et seq.* of F.S.), which defines who is permitted to trim mangroves and the limits of trimming.

Table J-1. Special Status Plant Species Occurring in Brevard and Martin Counties, Florida and Occurrence within 45 SW

Common Name	Scientific Name	Federal Status (ESA)	State Status (FWC)	Climate Change Vulnerability Index (CCVI)	Management Priority	Known to Occur (Detected in Recent Surveys)			
						CCAFS	PAFB	MTA [†]	JDMTA
Plant Species									
sea lavender	<i>Argusia gnaphalodes</i>	-	E	-	-				
four-petal pawpaw	<i>Asimina tetramera</i>	E	E	-	-				
Curtiss' sandgrass	<i>Calamovilfa curtissii</i>	-	T	-	-				
many-flowered grass-pink	<i>Calopogon multiflorus</i>	-	E	-	-				
sand butterfly pea	<i>Centrosema arenicola</i>	-	E	-	-				
sand-dune spurge	<i>Chamaesyce cumulicola</i>	-	E	-	-				
satin-leaf ^a	<i>Chrysophyllum oliviforme</i>	-	T	-	Low	✓			
perforate reindeer lichen	<i>Cladonia perforata</i>	E	E	-	High				✓
piedmont jointgrass	<i>Coelorachis tuberculosa</i>	-	T	-	-				
large-flowered rosemary	<i>Conradina grandiflora</i>	-	T	-	-				
Florida tree fern	<i>Ctenitis sloanei</i>	-	E	-	-				
hay scented fern	<i>Dennstaedtia bipinnata</i>	-	E	-	-				
Lakela's mint	<i>Dicerandra immaculata</i>	E	E	-	-				
titusville balm	<i>Dicerandra thimicola</i>	-	E	-	-				
tropical ironwood	<i>Eugenia confusa</i>	-	E	-	-				
coastal vervain	<i>Glandularia maritima</i>	-	E	-	Low	✓			
tampa vervain	<i>Glandularia tampensis</i>	-	E	-	-				
Johnson's seagrass	<i>Halophila johnsonii</i>	T	-	-	-				
simpson's prickly apple	<i>Harrisia simpsonii</i>	-	E	-	-				
beach jacquemontia	<i>Jacquemontia reclinata</i>	E	E	-	-				
Atlantic Coast Florida lantana	<i>Lantana depressa</i> var. <i>floridana</i>	-	E	-	Low	✓			
nodding pinweed	<i>Lechea cernua</i>	-	T	-	-				
pine pinweed	<i>Lechea divaricata</i>	-	E	-	-				
small's flax	<i>Linum carteri</i> var. <i>smallii</i>	-	E	-	-				
Simpson's stopper ^b	<i>Myrcianthes fragrans</i>	-	T	-	Low	✓			
celestial lily	<i>Nemastylis floridana</i>	-	E	-	-				
Florida beargrass	<i>Nolina atopocarpa</i>	-	T	-	-				
hand fern	<i>Cheiroglossa palmata</i>	-	E	-	Low			✓	
shell mound prickly-pear cactus ^b	<i>Opuntia stricta</i>	-	T	-	Low	✓	✓		
terrestrial peperomia	<i>Peperomia humilis</i>	-	E	-	-				

Table J-1. Special Status Plant Species Occurring in Brevard and Martin Counties, Florida and Occurrence within 45 SW

Common Name	Scientific Name	Federal Status (ESA)	State Status (FWC)	Climate Change Vulnerability Index (CCVI)	Management Priority	Known to Occur (Detected in Recent Surveys)			
						CCAFS	PAFB	MTA [†]	JDM TA
blunt-leaved peperomia	<i>Peperomia obtusifolia</i>	-	E	-	-				
tiny polygala	<i>Polygala smallii</i>	E	E	-	-				
giant orchid	<i>Pteroglossaspis ecristata</i>	-	T	-	-				
beach star ^b	<i>Remirea maritima</i>	-	E	-	Low		✓		
sandyfield beaksedge ^b	<i>Rhynchospora megalocarpa</i>		E	-	Low	✓			
inkberry ^b	<i>Scaevola plumieri</i>	-	T	-	Low		✓		
coastal hoary-pea	<i>Tephrosia angustissima</i> var. <i>curtissii</i>	-	E	-	-				
common wild-pine	<i>Tillandsia fasciculata</i>	-	E	-	Low	✓			
banded wild-pine	<i>Tillandsia flexuosa</i>	-	T	-	-				
dancing-lady orchid	<i>Tolumnia bahamensis</i>	-	E	-	-				
scentless vanilla	<i>Vanilla mexicana</i>	-	E	-	-				
redmargin zephyrlily	<i>Zephyranthes simpsonii</i>	-	T	-	-				

FEDERAL STATUS

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3.

E = Endangered = Species in danger of extinction throughout all or a significant portion of its range.

T = Threatened = Species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

C = Candidate = Species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

E, T = Species currently listed endangered in a portion of its range but only listed as threatened in other areas.

PS: E, T = This species has partial status (i.e., throughout a subset of its range) and is listed as endangered in a portion of its range but only listed as threatened in other.

E, PDL = Species currently listed endangered but has been proposed for delisting.

E, PT = Species currently listed endangered but has been proposed for listing as threatened.

E, XN = Species currently listed endangered but tracked population is a non-essential experimental population.

SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.

SC = Not currently listed, but considered a "species of concern" to USFWS.

Definitions derived from Bald and Golden Eagle Protection Act.

BGEPA = Bald and Golden Eagle Protection Act = Species is federally protected under the Bald and Golden Eagle Protection Act

Table J-1. Special Status Plant Species Occurring in Brevard and Martin Counties, Florida and Occurrence within 45 SW									
Common Name	Scientific Name	Federal Status (ESA)	State Status (FWC)	Climate Change Vulnerability Index (CCVI)	Management Priority	Known to Occur (Detected in Recent Surveys)			
						CCAFS	PAFB	MTA [†]	JDMTA
STATE STATUS <i>Wildlife:</i> Definitions derived from “Florida’s Endangered Species and Species of Special Concern, Official Lists” published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates. <i>T = Threatened</i> = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future. <i>SSC = Species of Special Concern</i> = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. <i>Plants:</i> Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: http://www.doacs.state.fl.us/pi/ . <i>E = Endangered</i> = Species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act. <i>T = Threatened</i> = Species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be endangered.									
CLIMATE CHANGE VULNERABILITY INDEX <i>EV = Extremely Vulnerable</i> = CCVI score above 10 <i>HV = Highly Vulnerable</i> = CCVI score ranging between 7 and 10 <i>MV = Moderately Vulnerable</i> = CCVI score ranging between 4 and 7 <i>PS = Not Vulnerable/Presumed Stable</i> = CCVI score ranging between -2 and 4 <i>IL = Not Vulnerable/Increase Likely</i> = CCVI score below -2									
<i>General Sources:</i> FNAI 2014; Florida Department of Agricultural and Consumer Services 2014; USFWS 2014; Dubois et al. 2011. <i>Site Specific Sources (CCAFS):</i> Gullledge et al. 2009; Reyier et al. 2011; Reyier et al. 2010; Stolen and Oddy 2012; Fleming and Greenwade 2007; Hankla 2008. <i>Site Specific Sources (PAFB):</i> Oddy et al. 1997; Fleming and Greenwade 2007; Hankla 2008. <i>Site Specific Sources (MTA):</i> VZ Technologies, LLC et al. 2014; USAF 2014a; Fleming and Greenwade 2007. <i>Site Specific Sources (JDMTA):</i> Chambers 2013; Fleming and Greenwade 2007. <i>Notes:</i> ^a Not documented as by FNAI (2014) as occurring in either Brevard or Martin County, but documented as occurring on 45 SW properties by VZ Technologies, LLC et al. 2014 or USAF 2014a. ^b Not documented by FNAI (2014) as occurring in either Brevard or Martin County, but documented in Gullledge et al. 2009. ^c Eastern indigo snake is assumed to occur wherever gopher tortoise burrows are present; however, evidence of this species occurrence has not been observed since the 1990s. [†] For special status species “potential occurrence” see VZ Technologies, LLC et al. 2014. ✓* Species does not occur on 45 SW properties but occurs in water adjacent to and 45 SW is required to consult for potential impacts.									

4.0 Wildland Fire History

Wildland fires include unplanned wildfires and scheduled prescribed burns. Wildfires in central Florida occur periodically as a result of lightning strikes. Throughout history, wildfires have been so prevalent that the majority of wildlands in Florida have evolved into fire-dominated ecosystems. Similarly, wildlife species inhabiting those wildlands have also learned to survive periodic wildfires and consequently have become dependent on various aspects of this fire cycle. Periodic wildfires rejuvenate forests and are an integral component in the life cycle of numerous plant and animal species. Since European settlers arrived in Florida, wildfire suppression has been employed to protect people and property. Suppressing naturally occurring wildfires allows the build-up of vegetative fuel loads and adversely affects the health of the forest and the habitat quality for indigenous wildlife species, as well as ultimately increasing risks to people and property. In addition, seasonal drought conditions can exacerbate the wildfire potential with the increased fuel load allowing a lightning strike to result in a catastrophic wildfire. A recent example of this situation occurred throughout the State of Florida in 1998. Documentation of similar catastrophic wildfires has occurred throughout the recorded history of Florida.

Since Air Force acquisition of the lands comprising the 45 SW properties, the suppression of wildland fires has been mandated for the protection of personnel and property. On CCAFS, the majority of wildland fires were actually caused by inadvertent ignition from rocket/missile launches, launch anomalies, or other human related activities. Regardless, the response to a wildfire has always been immediate suppression. When a naturally occurring, lightning ignited wildfire does occur on a 45 SW installation, the response is to immediately suppress the fire. This response does inhibit the natural fire cycle and creates unfavorable forest conditions; however, the protection of 45 SW personnel and mission resources is foremost. One of the goals of this WFMP is to establish a procedure whereby naturally occurring wildland fires may be controlled, instead of immediately extinguished, for the purpose of reducing fuel loads and improving habitat/forest quality.

On CCAFS, the 45 SW utilizes prescribed fire as a land management tool. Prescribed fire is used primarily as a mechanism to improve the quality of selected portions of the CCAFS coastal scrub habitat for the federally threatened Florida Scrub-jay (see Skid Strip BO, Appendix K, Attachment K-2.6). A secondary benefit of prescribed fire on CCAFS is to reduce the amount of vegetative fuels accumulated during 50 years of fire suppression at CCAFS. The amount of accumulated fuels has created an imminent danger to USAF and contractor facilities and personnel on CCAFS. In addition, the USAF uses prescribed fire in portions of CCAFS to implement some of the goals and objectives described in the INRMP.

A total of 8,030 acres of unimproved lands were grouped into 134 management compartments to facilitate the prescribed fire program on CCAFS (see **Attachment J-2**). These compartments are delineated by roads, firebreaks, lines-of-sight, canals and other natural and man-made barriers and each one has been identified to receive various scrub habitat manipulations. The first prescribed burn conducted by the 45 SW on CCAFS was ignited in 1992 in compartment number 116. For more information on CCAFS fuel loads, land management unit status, future prescribed burn activities, burn vegetation, and mapping, refer to **Appendices J-1, J-2, J-3, J-4** of this document.

Subsequent prescribed fires demonstrated the fire hazards associated with the suppression of wildfires and the subsequent accumulation of fuels. These hazards include high flame length, fire intensity, excessive smoke and ash generation, limited forest accessibility, fire spot-overs, crown fires, etc. For these reasons, the pre-burn preparation of a compartment was increased from only establishing perimeter firebreaks to cutting all vegetation within the compartment. This action reduced the height of the vegetation, thereby reducing flame height, fire intensity and the number of spot-overs. Mechanical treatment of a compartment is now scheduled approximately six months prior to conducting the prescribed fire. This achieves the fuel management goals and allows adequate time for "green" vegetation to dry enough to support fire.

5.0 Wildland Fuel Factors

Wildland fuel factors on the 45 SW properties vary widely between installations and at different locations within a single installation, specifically CCAFS, PAFB and MTA. Fuel factors are described separately for each installation and broken down further by wildland types as applicable in the following sections. Typical wildland fuel factors that could apply include, but may not be limited to: type of fuel, size of fuels, accumulation of fuels, combustibility/flammability of fuels, continuity of fuel, and fuel moisture content.

The FFS has adopted the use of the Keetch-Byram Drought Index (KBDI) as an indicator of soil and surface fuel dryness. High values of the drought index are associated with severe wildfire outbreaks such as those which occurred during 1998. However, no threshold point has previously been determined to indicate that conditions are far above normal and warrant concern. Using 35 years of rainfall and temperature measurements from nine locations throughout the state, average KBDI values are determined for the state on a regional basis. These regions are North (stations used are Pensacola, Tallahassee and Jacksonville), Central (Daytona, Gainesville and Orlando) and South (Tampa, Fort Meyers and Miami). This extrapolation operates under the premise that widespread drought is accompanied by severe wildfire outbreaks. The average KBDI is compared to recent levels of fire activity (1981 – present) to determine threshold levels that indicate above normal fire activity.

The mean drought conditions show a wide range of variability by region. Winter conditions are driest in the south and become wetter to the north because the central and northern regions experience a greater frequency of frontal passages. During the summer, convective activity produces significant rainfall particularly in the southern part of the state. Florida's fire season begins with increased activity starting in January and peaking in May and June. All three regions exhibit a peak in their KBDI around the May-June period. Drought conditions are high during the fall but fire activity is at a minimum. Thus, threshold values need to be determined on a monthly basis to account for the seasonal variation in fire activity.

In addition, the FFS has developed an internet based mapping tool referred to as Florida's Wildland Fire Risk Assessment System (FRAS). Wildland fire management tools can be accessed via the FFS website at <http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildfire/Resources/Fire-Tools-and-Downloads>. This data is continuously monitored by 45 SW prescribed fire management personnel.

5.1 Cape Canaveral Air Force Station

A map of CCAFS fuel loads was created in 1999 (see **Attachment Map J-1**). This map was developed based on the absence of fire and the accumulation of combustible biomass within the forest and on the forest floor. The resolution of this map is not high enough to provide accurate compartment-specific data on all applicable fuel factors; however, it does provide a good overview of potential "hot spots" where fire intensity could result in an uncontrollable fire situation. **Attachment Map J-4a** shows the vegetation communities within CCAFS based on FNAI data (FNAI 2012).

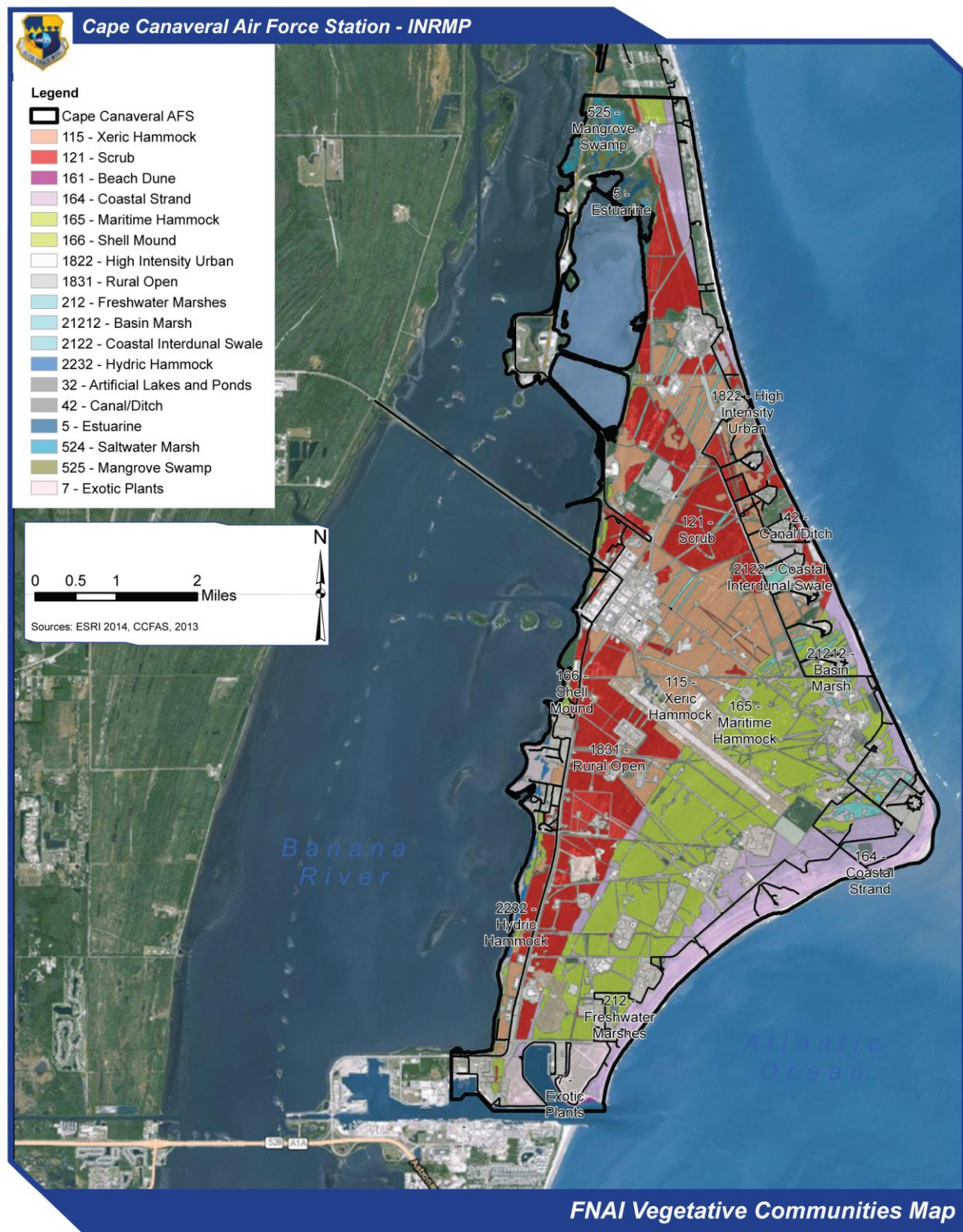


Figure J-1. FNAI Vegetative Communities Map for CCAFS

5.2 Patrick Air Force Base

On PAFB, wildlands are limited to the natural dune vegetative community and the Family Campground area (FAMCamp). The dune vegetation could burn under the right conditions, but a fire in this vegetation/fuel type is very rare. The width of dune vegetation along the Atlantic coastline of PAFB varies between 25-100 feet and stretches linearly for most of the 4.5 mile coastline. Small breaks occur adjacent to the few developed areas, such as the former Officers Club, Non-Commissioned Officers (NCO) Club area and Temporary Lodging Facilities. There is no adjacent coastal strand vegetation, but rather an area of mowed and maintained native grasses. This area includes the shoulder of State Road A1A, a four lane highway that bisects PAFB.

The areas surrounding the airfield are mowed and maintained grasses, similar to the housing areas, industrial and administrative areas, and the golf course. The only “forested” area on PAFB is located around the FAMCAMP, which is located along the Banana River shoreline. The vast majority of vegetation in this area is Brazilian Pepper and Australian Pine trees, which are exotic/invasive plant species and are not prone to burning. Since these trees resist fire, even when dead and dried/aged, and the remaining undeveloped lands are considered light fuels (grasslands), the fuel factors present are not expected to support a wildland fire as described in this WFMP. **Attachment Map J-4b** shows the vegetation communities within PAFB based on FNAI data (FNAI 2012).

5.3 Malabar Tracking Annex

Fuel factors at the MTA vary due to the significantly different forest communities within the installation: oak hammock and pine flatwoods. Both forest types have experienced the suppression of naturally occurring wildfires throughout the history of the installation, which dates back to World War II. Due to the absence of fire, a dangerous amount of fuel, in the form of pine needles, oak leaves and tree limbs has accumulated in a sizable duff layer and “ground to crown” fuel ladders in the older pine and oak trees. The height of the mature oak and pine trees add to the significance of the fuel load and exacerbates the difficulties associated with control of a wildland fire.

The potential severity of the consequences from a wildland fire at MTA is further elevated by the fact that the installation is surrounded by private residences and some commercial development. Further, a wildfire was ignited by lightning at MTA during the summer of 2005 and by arson in the southwest corner in 2011 showing the need to reduce the extensive fuel load in the wooded portions of the installation. As a result, on 1 December 2005, the City of Palm Bay Fire Department and the FFS conducted a prescribed fire on approximately 100 acres in the northwest quadrant of the Annex. Unfortunately, due to various constraints (e.g., local smoke concerns), no additional prescribed fires have been implemented and none are currently planned. In the event prescribed fire is implemented again at MTA; the prescribed burn units illustrated in **Attachment J-12** could be utilized. **Attachment Map J-4c** shows the vegetation communities within MTA based on FNAI data (FNAI 2012).

5.4 Jonathan Dickinson Missile Tracking Annex

Fuel factors at JDMTA include those fuels associated with a sand pine scrub vegetative community. Some of these factors create a mixture of oak leaves, pine needles, and various forbs and grasses comprising a flammable duff layer. Large pines, palms, mature scrub oak and palmetto make up the vertical fuels and various species of grasses, weeds and underbrush complete the installation’s fuel factors. However, the severity of the fuel load at JDMTA is mitigated by the fact that “wildlands” on the installation are minimal and discontinuous. There are two scrub “islands” along the eastern fence of the main compound and a separate, larger forested area paralleling the western boundary of the facility. The fourth wildland area at JDMTA surrounds the tower to the east. The larger area paralleling County Line Road, consisting primarily of pine and scrub oak was preserved during construction to provide a visual barrier between the road and adjacent residential community.

Any of these areas could burn if ignited under the right weather conditions; however, the limited size of the wildland parcels would facilitate containment and minimize the potential for spread into the adjacent Jonathan Dickinson State Park (JDSP). In addition, JDSP personnel periodically burn the land adjacent to the JDMTA, which further minimizes the potential for wildfires on JDMTA. **Attachment Map J-4a** shows the vegetation communities within JDMTA based on FNAI data (FNAI 2012).

6.0 Organizational Structure

Wildland fires on 45 SW installations may be ignited in a number of different ways under a variety of circumstances. Furthermore, wildland fire responders differ at each installation. The source of a wildland fire could include a launch or lightning ignited fire, in-house prescribed fires, or USFWS/ Merritt Island National Wildlife Refuge (MINWR) prescribed fire. Other ignition sources could be man-induced intentional, unintentional, and accidental/careless. The easiest way to describe the various scenarios that would require a specific, and different, organizational structure would be to describe separate structures for each installation and type of wildland fire.

A wildland fire management organizational structure describes the personnel and agencies necessary for all operations involved in the execution and control of wildland fires. All organizational structures are consistent with the National Wildland Fire Coordinating Group (NWCG) Incident Command System standards. Should a wildfire arise, either from natural causes or from a prescribed fire, a modified 45 SW Fire Department organizational structure with additional off-site resources may be necessary.

Regardless of whether a prescribed fire is conducted under the ultimate supervision of the 45 CES/CEIE-C, the Environmental Support Contractor (ESC), the Natural & Cultural Resources Contractor (NCRC) or USFWS/MINWR, the following general Chain of Command or Organizational Structure will be implemented for the purposes of decision-making and commanding the operation. The four primary positions and their responsibilities are described below.

Commander, Det. 1: The Cape Commander, Det 1 45 MSG/CC, has overriding authority to approve, disapprove or cancel a scheduled prescribed burn for reasons he/she believes could negatively affect the 45 SW mission, personnel, facilities and/or the installation's resources.

Burn Boss/Supervisor: The Burn Supervisor is responsible for obtaining the necessary permits through the FFS, writing the burn prescription, identifying assignments for all participants, developing the burn sequence and coordinating the burn schedule. In addition, the Burn Supervisor is responsible for the entire operation and for the safety of all individuals involved.

A trained and certified representative from the 45 CES/CEIE-C or the ESC would be designated the Burn Supervisor when the proposed burning of a compartment does not require the additional support services of the USFWS/MINWR.

If the USFWS/MINWR is needed to cooperate in the prescribed fire, a qualified individual from the USFWS may assume the role of Burn Supervisor. USFWS personnel at MINWR are trained and certified individuals with many years of experience in conducting and commanding prescribed burns, both on USFWS lands and on CCAFS.

Senior Fire Officer: The Senior Fire Officer represents the CCAFS Fire Services Department. Responsibilities include coordinating with the Burn Supervisor and assisting in the development of the prescription for adequate protection of surrounding structures. The Fire Department will assume a standby status. Should an adverse fire condition arise that may jeopardize the safety and success of the prescribed fire, emergency response from the Fire Department will be necessary. This may include deployment of Fire Department equipment and personnel to assist as needed in controlling and extinguishing the fire and providing their emergency operational support.

Ground Support Crew: Ground support is composed of individuals trained and certified in prescribed fire who are responsible for assisting with the firing sequence and other activities of the prescribed fire operation as necessary. The Burn Supervisor and Ground Support personnel are the only individuals who can ignite the prescribed fire. Ground support personnel will continually measure local weather conditions, patrol the perimeter of the fire in search of escaped fires and advise the Burn Supervisor of factors that may influence fire behavior. In most cases, representatives trained and certified in prescribed fire from the 45 CES/CEIE-C and ESC will be assigned the role of Ground Support Crew.

The following outlines the organizational structure for each type of fire on CCAFS, PAFB, MTA and JDMTA with general roles and responsibilities for each participant.

6.1 Cape Canaveral Air Force Station

6.1.1 Wildland fire- lightning/accidental ignition

When a wildfire is identified on CCAFS, the emergency response system will be contacted dialing 911, or on CCAFS, 853-0911, when using a cell phone. The call would be received by the Duty Office (911), Security and/or the Fire Department. Fire Department personnel would be deployed to the scene as soon as possible. The standard CCAFS Fire Department Chain of Command structure for fire response would be in effect.

6.1.2 Wildland fire - launch blast ignition

In support of all rocket launches on CCAFS, the 45 SW has established a group of operational managers and Commanders who directly support pre- and post- launch activities from a location remote from the Launch Complex, but within range to provide first response to the launch site after the rocket has cleared the immediate area. This assemblage of personnel is called the Launch Disaster Control Group (LDCG) and its primary mission is real time operational support for all CCAFS launches. Members include representative(s) from the 45 SW, including Det 1, Commander's office, Civil Engineering/Environmental, Operations Group Commander, Launch Group Commander, Safety, Explosive Ordnance Disposal (EOD), National Aeronautics and Space Administration (NASA), and contractor supported activities, including Emergency Preparedness, Fire Department, Security, Environmental Health, and launch vehicle/payload company representatives.

If the USAF decides to utilize a launch blast ignited fire for the purpose of meeting their prescribed fire objectives for CCAFS, this will be coordinated far in advance of a rocket launch OpStatus will be briefed, the Launch Readiness Review will be conducted by the Environmental Flight, and the full burn notification process implemented. Following the launch, the LDCG will make the final decision on whether to extinguish the fire immediately or allow the prescribed fire crew to utilize the situation to conduct a prescribed fire for habitat enhancement/restoration. If a decision is made to extinguish the fire, the CCAFS Fire Department will implement their normal wildland fire suppression procedure(s), which includes their specific organizational Chain of Command. Should the decision be made to utilize the opportunity to conduct a prescribed fire, then the 45 CES/CEIE-C prescribed fire procedures will be implemented, as described in **Section 6.1.3**.

6.1.3 Wildland Fire - Prescribed fire – Environmental Support Contractor

Wildland fires deliberately ignited for the purpose of habitat restoration and/or fuel load reduction may be conducted under the direction of the 45 SW Environmental Flight (45 CES/CEIE-C). Currently, 45 CES/CEIE-C contracts services to provide prescribed fire support on CCAFS. This support includes providing planning, logistics, equipment, and personnel adequate to perform a prescribed fire in accordance with the NWCG.

The contractor collaborates with the 45 CES/CEIE-C to develop prescribed burn plans and prescriptions for conducting fires in designated burn compartments. In addition, the contractor will create or refurbish existing fire breaks and ignition strips as determined necessary by the prescribed fire planning group. The USAF contract requires the contractor to provide full prescribed fire support up to, and including, the prescribed burn boss and a complete burn crew.

6.1.4 Wildland Fire – Prescribed fire - USFWS/MINWR

The 45 CES/CEIE-C contracts with the USFWS/MINWR to support large burns on CCAFS, typically when the use of aerial ignition is necessary to obtain the goals identified for a specific burn. When this scenario occurs, the Refuge's Fire Management Officer assumes the responsibilities of the Burn Boss. Personnel from CEVP and the ESC/NCRC typically become members of the Ground Crew under the direction of USFWS personnel.

6.2 Patrick Air Force Base

6.2.1 Wildland fire – lightning/accidental ignition

Wildfires occurring on PAFB would be extinguished immediately upon identification to ensure the safety of base personnel and protection of valuable wing assets and resources. Given the lack of unimproved land or natural vegetative communities on PAFB, conducting prescribed fires or allowing wildfires to proceed as a prescribed fire are not viable options. The PAFB Fire Department will be responsible for extinguishing all wildland fires on the installation and their normal fire response Chain of Command would be implemented. If personnel require evacuation, for instance in the FAMCAMP, then the procedures already established would be implemented such as those contained in Operational Plan (OPlan) 10-2 *PAFB Emergency Response Action Plan*.

6.3 Malabar Tracking Annex

6.3.1 Wildland fire – lightning/accidental ignition

Wildfires occurring on MTA would be extinguished by the City of Palm Bay Fire Department as quickly as logistically possible. Due to the remote location of MTA from CCAFS and the 45 SW prescribed fire management personnel, there would be no effort made to utilize a wildfire situation to conduct a prescribed burn. For wildfires occurring on MTA, it is expected that the Palm Bay Fire Department would respond and implement their established fire response Chain of Command/organizational structure.

6.3.2 Prescribed fire – City of Palm Bay/Florida Division of Forestry

When conducting prescribed burns on MTA, the FFS would be responsible for conducting the burn and establishing a Chain of Command specific to each operation in conjunction with the City of Palm Bay Fire Department. Organizations such as the FFS have general organizational flow charts with specific individuals assigned to each position based upon the location and specific office conducting/supporting the operation. As with all prescribed burns, the Chain of Command and identification of individuals assigned to each position are identified in the burn plan/prescription that is developed specifically for every burn

7.0 Mission Impact Considerations

Wildland fires have the potential to both positively and negatively impact the mission of the 45 SW. Further, the severity of potential mission impacts would vary depending on the location or installation where the wildfire occurs. Regardless of location, the primary adverse impact would be the loss of life and/or critical facilities at any of the 45 SW locations. The severity of the affect beyond that would be directly related to how critical the impacted facility is and the amount of damage. Loss of personnel or facilities resulting from a wildfire has never occurred on the 45 SW, but the potential does exist. To date, the only adverse impact experienced on the 45 SW resulting from wildfire is the impact of smoke and particulates on flight hardware and/or payloads at launch pads or processing facilities. Smoke impacts include breathing impairment, visibility impairment, payload processing/clean room contamination, and ash/particulate fallout. Smoke contamination in “clean rooms”, whether at the payload processing facility or at the launch complex, can contaminate sensitive components on launch hardware and satellites resulting in launch failure, payload failure, launch schedule delay, and range schedule impacts. On PAFB, a wildfire could adversely affect launch support activities, aircraft flight operations, installation operations, and access. At MTA and/or JDMTA, a wildfire could impact the ability of those sites to support the Department of Defense (DoD), NASA or commercial launches from CCAFS or Kennedy Space Center (KSC).

In a wildfire scenario, the applicable fire department(s) would respond immediately to extinguish the fire, thereby minimizing the potential to affect the 45 SW mission from either fire or smoke damage. In the case of a prescribed fire, burn planners develop specific parameters for conducting a burn so that no facilities, personnel and infrastructure components would be adversely impacted by fire or smoke. All prescribed fires on CCAFS are coordinated with the launch and operations squadrons through the burn notification process and the CCAFS Prescribed Burn Working Group. Firebreak construction and/or maintenance and smoke management requirements typically preclude adverse mission impacts from a prescribed fire. Should any component of a prescribed fire exceed the previously established parameters (prescription), the team would go into fire suppression mode to immediately contain the fire. Any critical facilities experiencing adverse impacts during a prescribed fire can contact the Burn Supervisor.

In the case of a naturally occurring or an accidentally ignited wildfire that is being evaluated (real time) for use as a prescribed fire, the on-scene commander would consider down-wind facilities and operations for potential mission impacts from smoke and/or impacts if the fire should jump/spot-over a designated firebreak or control line.

As described in the Goals and Objectives section of this plan, positive impacts to the mission from prescribed fire implementation include fuel load reduction, protection of personnel and facilities, and enhanced security visibility. In addition, periodic prescribed burning helps maintain the health of the forest by eliminating dead and dying vegetation minimizing the threat of and damage from an uncontrollable wildfire. Potential negative impacts are identified and addressed in the prescribed burn prescription developed for each proposed fire. Any mission impact concerns would be evaluated and a procedure developed to avert the potential impact.

In addition, the potential of a prescribed fire becoming an uncontrollable wildfire could present negative mission effects as well. Every effort is made to minimize adverse impacts to 45 SW assets and maintain control of a prescribed fire throughout the entire operation. If the threat of a prescribed fire near an asset is too great then a no-burn decision is made. Additional strategies to minimize adverse impacts are also addressed in the Smoke Management and Air Quality sections of this plan.

Critical Facilities: Facilities designated as Critical Facilities are listed in 45 SW OPLAN 32-2, Annex N. These facilities are critical to mission accomplishment and are given priority consideration during planning for a prescribed fire and/or for emergency response actions as a result of a wildland fire.

Explosive or fuel storage areas warrant special consideration and preparation before a prescribed fire. If possible the materials are removed from the storage areas and a prescribed fire is accomplished in the

normal manner. If it is not possible to remove the ignitable fuels then Air Force Manual (AFMAN) 91-201 *Explosive Safety Standards* becomes applicable. There is some controversy over the direction given in this document in that for a prescribed fire there is a requirement for a setback from the facility or area of 200 feet and a maximum wind speed of 5 miles per hour. The result is unburned vegetation and a fuel load in close proximity to the explosive storage areas. This is counter intuitive to reducing the risk of damage from a wildfire. A request to modify AFMAN 91-201 is being developed in conjunction with the 45 SW/SE.

8.0 Safety and Emergency Operations

The primary goal of the Wildland Fire Management Program is to protect the safety and well-being of 45 SW personnel and mission resources, such as facilities, infrastructure, and natural and cultural resources. A typical response to a wildfire would be to extinguish the fire to ensure the safety of personnel and resources. In the prescribed fire scenario, the safety of personnel and resources is planned and incorporated into each prescription written for a prescribed fire. When a natural, accidental or inadvertently ignited wildfire occurs and on-scene responders are considering taking advantage of the situation to allow the fire to burn as a modified prescribed burn, safety concerns will be paramount in that decision-making process. All fire department and prescribed burn personnel receive extensive training in personal safety, fire safety and the safety of civilians and private property (see **Section 15.0**).

Under high fire danger situations the 45 CEVP will have notices put on the entrance gate electronic billboards alerting personnel of the potential danger of wildland fires. Under severe conditions, restrictions on having open fires (e.g., open barbecues), may be recommended by 45 CEVP should the situation warrant such action. If a wildfire required

Personnel Safety Equipment: Personnel actively participating in wildfire suppression or prescribed fire activities are required, at a minimum, to utilize the following protective safety equipment:

- Hard hat with chin strap
- Fire retardant trousers
- Fire retardant shirt
- 8" high (minimum), laced, leather boots
- Fire shelter
- Goggles/safety glasses
- Leather gloves
- Cotton underclothes, cotton socks
- Radio, cell phone or other form of communication
- Cotton bandana or dust mask may be used for particulates (optional)
- Tools: flappers, council rakes, shovels, etc. (optional)

Use of the above safety equipment provides personnel with a level of protection from potential injury. In the event of personnel injury and/or exposure to hazards, such as smoke inhalation, the individual will receive medical attention immediately from on-site medical personnel (CCAFS & PAFB). Circumstances resulting in injury of wildland fire personnel may require notification via the emergency response system by contacting 911, or on CCAFS, 853-0911, when using a cell phone. Any injuries requiring medical attention shall be reported according to USAF procedures.

In addition, public safety will be a first priority for both active participants and other 45 SW and civilian personnel who may be impacted by fire activities. Situations may arise with the potential to injure or negatively affect the public off base. If, after assessment of the situation, it is decided that there could be impacts beyond 45 SW property or ability to control, 911 will be called and emergency response would be initiated in accordance with established disaster preparedness procedures.

9.0 Smoke Management and Air Quality

One aspect of a fire that has the potential to create a significant adverse impact to human health, safety and the 45 SW mission is the smoke generated by a wildland fire. In the case of a wildfire, there is little that can be done to control smoke, other than to take steps to extinguish and/or reduce the size of the fire. With a prescribed fire, smoke management is an integral component of the prescription and may often be the primary factor in determining whether to conduct the burn or postpone ignition. In either case, there are actions that can be taken, either prior to or during a fire to preclude or minimize the effects of smoke.

Air quality is a concern during a fire since degradation can cause serious human health impacts and can severely impact wildlife and sensitive plants in the immediate area and downwind of the fire. Similar to smoke management, air quality degradation from a wildfire cannot be controlled by any means other than reducing the size of the area impacted by creating firebreaks and/or extinguishing the fire. Air quality is typically maintained during a prescribed fire because factors included in the prescription take smoke management into account. If a component of the prescription that could affect air quality is outside the established parameters, the fire would not be ignited. If one or more of those parameters becomes out of prescription during a prescribed burn, the operation would be called off and the fire extinguished as soon as possible.

When planning and conducting prescribed fires, the Burn Supervisor must implement and manage the fire in a manner that meets Clean Air Act (CAA) standards in accordance with applicable state and federal regulations (Public Law 95-95, etc). Currently all 45 SW installations are within areas designated as "attainment areas", which means that the air quality has attained the standards set by the US Environmental Protection Agency (USEPA) in the CAA. The responsibility for overseeing the requirements of the CAA has been delegated from the USEPA to the Florida Department of Environmental Protection (FDEP). In accordance with the CAA, the 45 SW is required to obtain a Title V permit for emissions generated on CCAFS/45 SW. In the Title V permit, the FDEP excludes prescribed burning as being exempt from the regulatory requirements of the permit. Therefore, smoke generated from a prescribed fire should not adversely affect the status of the 45 SW under the CAA. However, this does not mean that the implementation of a prescribed burn will ignore any efforts to minimize smoke, but rather prescriptions will include every means practicable to minimize emissions.

Aspects to consider when managing smoke include fuel load management, fuel load moisture content, wind speed and direction, atmospheric mixing elevations, firing and mop up techniques, and burn scheduling. This information will be considered and incorporated as appropriate into the specific burn plan/prescription for each burn. The following sections provide general smoke management techniques to consider when developing site-specific burn prescriptions that minimize the impacts of smoke.

9.1 Avoidance

Avoidance, as a strategy for smoke management, can be in one of two forms. The primary avoidance strategy consists of dictating meteorological conditions into a site-specific prescribed burn prescription that would prevent/preclude incursions of smoke into smoke sensitive areas. For example, a mission critical payload processing facility, or a populated area where any noticeable smoke is objectionable, may be considered a sensitive area. The most effective method of smoke management is to burn when the wind direction would carry the smoke away from these types of sensitive areas. Another method of avoidance would be to evacuate personnel from an area where smoke presents a problem, either with regards to visibility or respiratory distress.

9.2 Dilution and Dispersion

Smoke concentration can be reduced by diluting the smoke with a greater volume of air. This can be achieved either by scheduling a prescribed fire during wind conditions that facilitate dispersion or by

manipulating the burn rate (burning smaller or narrower strips or smaller areas). Basically, dilution involves controlling the amount of emissions generated and reducing the concentration of smoke by taking advantage of available winds. Dispersion refers to those processes within the atmosphere which mix and transport the smoke away from its source and do not allow it to concentrate in any one area. The concentration of smoke experienced at downwind locations greatly depends upon weather conditions at the fire site and within the downwind smoke path. Atmospheric dispersion mainly depends upon three characteristics of the atmosphere: atmospheric stability, mixing height, and transport wind speed. Atmospheric stability is a measure of the tendency for vertical mixing to take place in the atmosphere. Mixing height is the elevation within the atmosphere where the mixing process occurs. Transport wind speed is the average wind speed within the smoke-laden layers of the atmosphere where smoke is diluted. All of these factors are included in a burn prescription and assessed prior to and during a controlled burn. Again, these factors cannot be predicted in the event of an uncontrolled wildland fire but they would be measured, analyzed and then become a significant component of the decision-making process when evaluating the potential to utilize a wildfire as an opportunity to conduct a controlled burn.

9.3 Emission Reduction

Emission reduction techniques minimize the smoke output from a unit area being burned. Fuel moisture levels are measured prior to conducting a prescribed fire, both for flammability and smoke generation. Should the fuel moisture level exceed the established parameters, the burn would be postponed until moisture levels have decreased. There is no control over fuel moisture levels in the event of a wildfire. In the case of a wildfire where high levels of smoke are generated that pose a threat to mission critical facilities or populated areas, every effort would be made to extinguish the fire immediately.

It is difficult to reduce smoke emissions when conducting a prescribed burn in an fire dependent vegetative communities that have experienced fire suppression for an extended period of time. However, there are pre-burn actions that can be implemented which would help reduce the size and intensity of a fire, thereby helping to reduce emissions (smoke). The primary method of reducing smoke emissions is to reduce the size of the fire by reducing the amount of area included in a prescribed fire. In the case of a wildfire scenario, isolating the fire by surrounding it with a firebreak would reduce the fire size and thereby minimize smoke emissions. Fire suppression could also reduce emissions, however, moisture typically increases smoke generation, if only temporarily.

9.4 Factors Affecting Smoke Management

Meteorological factors that affect smoke management include multiple weather interactions. CCAFS and PAFB are located on a barrier island on the central-east coast of Florida. Weather interactions, such as the Atlantic sea breezes, temperature variations (ocean/air/land), humidity, among others, play a significant role in both surface and upper wind directions. As weather patterns change, so does smoke behavior. General pressure patterns and fronts have pronounced effects on transport wind and atmospheric stability characteristics and affect how well smoke will disperse.

Frontal activity plays an important role in smoke behavior. Smoke movement and dispersion differ with the type of front. The speed of an approaching front is an important consideration when executing burns. A slow moving front results in steadier wind speeds and gradually changing wind directions. A rapidly moving front has more sudden changes in wind speed and direction. By dictating burn duration and determining how long a wind condition will exist, one can predict the likelihood of success in keeping smoke out of a sensitive area.

Cold fronts typically contain gusty winds and display rapid wind shifts. Behind a strong cold front, the air mass is generally unstable, which facilitates smoke dispersion and good visibility. The potential for smoke impacts behind a strong cold front tends to be short in duration; however, some high concentrations may occur locally. Consequently, there could be some control problems associated with strong cold fronts. As may be expected, smoke dispersion patterns are not nearly as good behind weak, slow moving cold fronts. The inherent atmospheric stability associated with the cold surface air mass often prevents smoke from rising, thereby trapping smoke near the ground. In a strong cold front, this effect is largely overcome

by high surface wind speeds. In a weak cold front, the lower wind speeds contribute to this adverse smoke affect.

Warm fronts and their associated wind speeds are typically lighter and shifts in wind direction are more gradual compared to a cold front. Burning during warm frontal activity can result in high smoke concentrations for long periods of time. For example, an area remains downwind for a longer period. In addition, as a warm front approaches, stable upper layers descend, resulting in a lower mixing height and a smaller mixing volume for smoke. Normally, visibility decreases as rain and fog occur ahead of the front. Smoke, in the decreasing volume of air, will combine with the fog and rain and result in very low visibility. Prescribed burns will be scheduled to prevent the potential for reduced visibility resulting from interactions with rain or fog. Smoke conditions would be expected to improve as the front passes, but overall dispersion could still be limited due to light wind speeds.

Stationary fronts make forecasting smoke movement difficult because of their characteristic variable and changing wind conditions. Light winds generally blow in opposite directions on either side of the front. The front meanders resulting in variable transport winds with no sustained or predictable directions. Poor mixing and dispersion can be expected near the front with light winds, precipitation, and reduced visibility. Prescribed burning would be limited because smoke will interact with frontal characteristics and intensify naturally occurring poor visibility.

Mission requirements that affect smoke management analysis and the burn prescription include preventing smoke plumes from reaching sensitive areas such as launch complexes, payload processing facilities and flight hardware. Smoke entering these facilities or otherwise affecting payloads and/or flight hardware may delay launch schedules. Preventing negative effects from smoke on sensitive areas by identifying suitable wind directions is the primary factor considered when developing a prescription and scheduling and implementing a prescribed burn.

Human health and safety factors that affect smoke management include preventing smoke from reaching populated areas and heavily traveled roadways. Populated areas include the Port and Industrial Areas of CCAFS and any other sites occupied by a large number of personnel, such as the ITL area, active Launch Complexes, NOTU, ROCC, etc. Impacts from smoke effect public health and safety by decreasing the air quality and reducing visibility on roadways. Negative effects on air quality and visibility can be minimized by scheduling burns under wind and weather conditions that would direct the smoke away from populated areas and roadways. In addition, burns could be scheduled during weekends when workforce populations are at a minimum, thereby affording more flexibility in prescribing wind direction and other burn constraints.

10.0 Natural and Cultural Resources Considerations Checklist

Prescribed fire is commonly used as an effective means of improving wildlife habitat and enhancing the quality of forested areas. In central Florida, the scrub ecosystems and the wildlife species that inhabit and/or utilize them have evolved to become fire-dependant. Some short-term negative impacts to wildlife may occur during a fire, but the long-term benefits are integral to the survival of many scrub-dependant species.

Nesting birds could be impacted through direct destruction of nests located in trees targeted for cutting during site preparation or during the prescribed burn. Despite the potential loss of an occasional nest, it is believed that restoring fire-suppressed xeric oak hammock to its original oak scrub condition through the use of prescribed fire over the long term will benefit both resident and migratory bird species. The Migratory Bird Treaty Act makes it illegal to kill or destroy the eggs or nest of any migratory bird. In addition, the Florida Scrub-jay is a federally listed threatened species that must also be protected during the implementation of a prescribed fire. Therefore, when developing the site-specific burn plan/prescription, the Burn Supervisor will contact the 45 CES/CEIE-C to identify known scrub-jay territories and nest sites to ensure preservation of those areas prior to and during a burn.

Further, prescribed fire activities have the potential to negatively impact other species such as gopher tortoises, snakes and small mammals. Pre-burn activities may include mechanical preparation of the compartment using heavy equipment (e.g., root rake, roller chopper, bulldozer, and tree cutters). The fire and associated smoke could briefly affect some slow moving species; however, the long term benefits far outweigh any short-term impact(s).

Potential impacts to cultural resources will be considered in the pre-burn planning stages. The 45 SW CES/CEIE-C has documented and delineated the majority of known cultural resource sites on the 45 SW. Further, the 45 CES/CEIE-C staff archaeologist will be consulted as burn compartments are identified for prescribed burning. This coordination and site identification will ensure the protection of all significant cultural resources.

The Natural and Cultural Resource Checklist for Prescribed Fire Activities, included in **Appendix J-7**, will be used to identify resources that should be given consideration for protection prior to developing and implementing a site-specific prescribed burn plan on any 45 SW installations. The completed checklist, including a description of proposed actions taken, shall be documented and maintained on file with the applicable burn prescription.

11.0 Monitoring Requirements

Wildland fire monitoring on the 45 SW installations primarily includes the periodic assessment of the State-wide KDBI to identify the potential risk for a wildfire and to assess conditions prior to, during and after a prescribed burn. The KDBI is accessed online via the FFS website. Rainfall is monitored by installing rain gauges at a proposed burn compartment and contacting the 45 SW Weather Squadron and National Weather Service in Melbourne, Florida. During a prescribed burn, smoke and weather conditions are monitored. Post-burn monitoring vegetation re-growth will be performed with in-house resources. A brief description of the various monitoring scenarios is provided below.

11.1 Wildfire: Pre-Burn

The 45 SW Weather Squadron and Fire Department monitors the KDBI for all 45 SW installations and briefs Wing leadership periodically throughout the drought and/or lightning strike fire season.

11.2 Wildfire: Post-Burn

After a wildland fire has been extinguished, the 45 SW Fire Department fire inspectors and the 45 CES/CEIE-C natural resource managers will inspect the burned area(s) and document/report their observations. Data from a naturally occurring or accidentally ignited wildfire will be added to the database established in the 45 CES/CEIE-C for documenting burns conducted for habitat restoration and fuel load reduction. This information would be used for comparison with prescribed fire operations.

11.3 Prescribed fire: Pre-Burn

There are three checklists used in the pre-burn process: 45 CES Prescribed Burn Coordinator Checklist, Natural and Cultural Resource Checklist for Prescribed Fire Activities, and SGS Controlled Burn Notification Checklist (see **Appendices J-6, J-7, and J-11** for copies of checklists). For additional clarification of the pre-burn process, refer to the Prescribed Burn Process Flowchart (**Attachment J-5**), Burn Supervisors Burn Prescription Process (**Appendix J-8**), Sample Prescribed Fire Plan (**Appendix J-9**), and SGS Duty Office Instruction (DO-I-16) Controlled Burn Notification Procedure (**Appendix J-10**).

Meteorological factors that will be measured prior to and during a prescribed burn are wind speed and wind direction, temperature, inversion height, humidity and conditions related to the dispersal of smoke. Measurements taken during a prescribed fire will occur on an as needed basis, determined by the Burn Supervisor. One member of the Burn Crew would be assigned to take weather measurements as a component of the burn prescription. All measurements will be documented and will be available for post burn analysis, if necessary.

Prior to the prescribed fire, a pre-burn assessment of the vegetative makeup and quality of the habitat to be burned shall be documented. Additionally, post-burn assessments, shall be conducted at 6 and 12 month intervals. The results of the assessments and any subsequent actions will be recorded and kept on file in the CEVP Fire database. Comparison of the pre- and post- burn assessments can be useful in determining future burn cycles for any particular compartment.

Monitoring as part of the prescribed burn planning process (pre-burn) includes, but may not be limited to, the following:

- Rainfall amount: use of rain gauges at the compartment
- Fuel load condition assessment: to be conducted by the burn supervisor and CEVP burn coordination
- Monitoring the KDBI: available from FFS on-line
- Monitoring weather trends: analyze previous days, weeks, etc.

Weather Forecast Process: The primary source of weather forecast information for prescribed burns is the 45 Weather Squadron. A potential burn date will be determined using the Weather Squadron's weekly forecast with the primary focus on wind direction, wind speed, and precipitation. All other mission-related and operational constraints will be considered and if there are no complications the burn team will begin the preparation, notification, and GO/NOGO decision processes. The potential burn date and status will be briefed by the Cape Commander, Det 1 45 MSG/CC, to the 45 SW senior leadership during the weekly OPSTATUS meeting, which typically occurs on Thursday morning. Further, the status of burn preparations will be briefed to the 45 CES/CC in the Weekly Activity Report.

Members of the burn team, nominally the Burn Supervisor, the Prescribed Burn Coordinator, and the Conservation Element Team Leader, will be updated by the 45 Weather Squadron every morning up to and especially including the day of the burn. The 45 Weather Squadron will issue a special fire weather forecast one (1) day in advance of the proposed prescribed fire and again the morning of the fire. The fire weather forecast will be disseminated to all of the personnel and organizations on the SGS Controlled Burn Notification Checklist (see **Appendix J-11**). The burn team will take into consideration fire weather forecasts from the National Weather Service Melbourne Office, FFS, and 45 SW. During the actual burn the burn team will continue to communicate with the 44 SW Weather Squadron to determine if there are any changes in the short term weather forecast.

The 45 SW Weather Squadron will in turn focus their assets on providing the most accurate long and short term forecasts possible that address the specific meteorological parameters that control the success of a prescribed burn, most importantly smoke dispersion and direction. During the day of a burn the 45 SW Weather Squadron will monitor every pertinent source of information, with emphasis on instrumented towers, atmospheric profilers, and weather radar, and relay that information to the burn team.

11.4 Prescribed fire: Post-Burn

The 45 CES/CEIE-C is currently developing a post prescribed burn response monitoring program. Monitoring was previously conducted by the Environmental Support Contractor where regeneration and growth of basic scrub plants and invasion by exotic plant species were documented. The data will be evaluated and analyzed to determine if it could be integrated into future efforts aimed at improving the results of a prescribed burn. This data could show what types of mechanical pre-treatment and mechanical manipulation of the habitat provides the best scrub restoration benefits.

Further, a post-fire assessment of a prescribed fire operation will be conducted to review and discuss planning, implementation, results, observations by crew members and recommendations for future burns. Topics specifically addressed include the following:

- Environmental/meteorological conditions that had impact on fire behavior;
- Conditions that impacted fire personnel, Impacts to personnel (roadways, occupied facilities, etc.);
- Impacts to wildlife, natural resources, and cultural resources;
- Safety concerns, issues, injuries or incidents;
- Damage to facilities or infrastructure; and
- Burn success (Were the goals and objectives of the specific burn achieved?) Factors affecting burn success, methods to improve burn success (including lessons learned) shall be identified, discussed and incorporated, as necessary.

12.0 Public Relations

The Joint Base Operations and Support Contractor (JBOSC) has developed an in-house Controlled Burn Notification Procedure, DO-1-16 (latest revision), to facilitate burn notification through Cape Support. This procedure establishes policy and guidance for the receipt, distribution and coordination of prescribed burn information received from the 45 CES/CEIE-C. The operation of the Cape Support function, which includes coordinating CCAFS activities/operations and the notification of base personnel, is a contractual requirement of the JBOSC.

Since the 45 SW has no plans to conduct prescribed burning on PAFB, MTA or JDMTA, there is no burn notification process required for those two installations. In the event of a wildfire on PAFB, the 45 Space Wing Operations Center Command post will initiate fire suppression, aural warning, or evacuation operations depending on the severity of the fire. A similar process is employed at MTA and JDMTA.

Jonathan Dickinson State Park, immediately adjacent to JDMTA, does conduct prescribed burns. Public notification is a requirement for all authorized prescribed burns conducted in the State of Florida. Therefore, we expect that the Florida Park Service would make the appropriate notifications for prescribed burning on the land surrounding JDMTA. In the case of a wildfire, personnel within JDMTA will be advised of conditions by the site manager.

13.0 Funding Requirements

Wildfire suppression, implemented solely to protect the health and safety of personnel, mission critical facilities, infrastructure, launch complexes, and off-site populations will be performed by the 45 SW Fire Department or their applicable fire support contractor. The 45 SW Fire Department and their contractor are assets of the 45 SW Civil Engineer Squadron and would be funded by them.

In accordance with 10 US Code (USC) 2665, expenditures for the protection and maintenance of commercial forests can be reimbursed by proceeds derived from the sale of forest products; however, the total reimbursement for forest management obligations related to wildfire suppression cannot exceed the forest management program proceeds in a given fiscal year on the installation. Since there are no commercial forest operations conducted on the 45 SW installations, this potential funding mechanism is not applicable.

The 45 CES/CEIE-C is the wing proponent for conducting prescribed burns on CCAFS. All CEVP personnel are trained, certified and experienced in conducting prescribed burns. Prescribed burning on CCAFS is conducted primarily to improve the quality of natural habitats and to reduce accumulated fuel loads around critical facilities. Therefore, wildland fire management activities conducted for the purpose of compliance with environmental laws and regulations will be supported by conservation funds.

In addition, the 45 CES/CEIE-C contracts with ESC/NCRC to provide a number of habitat restoration activities that are funded from the conservation budget, including prescribed burning support. To this end, the 45 CES/CEIE-C provides approximately \$30,000 annually to use heavy equipment to create fire breaks, ignition strips, cut vegetation to lower the fuel load, create prescriptions for approval and implementation and provide burn support with personnel and equipment. Similarly, CEIE-C provides approximately \$20,000 annually to the USFWS/MINWR to provide similar support on the larger prescribed burns requiring helicopter support and additional personnel/equipment.

14.0 Interagency Cooperation and Mutual Aid Agreements

Currently, a tripartite Cooperative Agreement signed in 1984 exists between the USAF/CCAFS, the USFWS and the Florida Fish & Wildlife Conservation Commission (FWC). Efforts to update the agreement are currently being conducted by both parties.

In addition, the 45 SW and NASA have implemented JDP-3003; CAPE CANAVERAL SPACEPORT KENNEDY SPACE CENTER & CAPE CANAVERAL AIR FORCE STATION JOINT DOCUMENTED PROCEDURE 3003, Fire Response, to share fire suppression resources as needed to ensure adequate protect against uncontrollable wildfires occurring on either CCAFS or KSC .

Interagency cooperation between USAF (45 CES/ ESC/NCRC), USFWS (MINWR), the Contract Support (ESC/NCRC), JBOSC Fire Department, JBOSC Security, and the FFS is required prior to and during prescribed fire operations on CCAFS. Cooperation includes, but may not be limited to, the sharing of personnel, equipment, and operational resources. Each agency has defined roles and responsibilities for all types of fire support. These roles and responsibilities may change based on the type and complexity of the burn operation. With regards to prescribed fires, the written prescription will describe the specific responsibilities of each agency and/or resource.

15.0 Personnel Training and Certification Standards and Records

Currently, the 45 SW has conservation personnel trained in prescribed fire activities. The training includes, but is not limited to, Basic Wildland Fire Behavior, Incident Command and Basic Wildland Firefighter Standards. Training records are maintained in the CEVP office and annual reviews and training sessions are conducted so that all personnel remain current with training requirements. These training records are available for review in the 45 CES/ ESC/NCRC office. Similarly, prescribed burning personnel employed by the ESC, and/or the USFWS/MINWR have their training records on file at their respective offices.

The following is an excerpt from the PMS 310-1 course book, dated April 2006, regarding training requirements for a Firefighter Type 2 (FFT2).

REQUIRED TRAINING:

Basic Firefighter Training:

- Introduction to ICS (I-100)
- Human Factors on the Fireline (L-180)
- Introduction to Wildland Fire Behavior (S-190)
- Firefighting Training (S-130)
- Annual Fireline Safety Refresher (RT-130)

REQUIRED EXPERIENCE

None [NOTE: for the Firefighter Type 2 (FFT2) position, satisfactory completion of the Required Training meets the position qualification requirements. The FFT2 position does not require completion of the FFT2 Position Task Book.]

PHYSICAL FITNESS LEVEL

Moderate

HQ AFSPC/A7CVP INTERIM GUIDANCE, WILDLAND FIRE PHYSICAL FITNESS REQUIREMENTS

1. The purpose of this email is to provide interim guidance on physical fitness requirements for personnel participating in wildland fire operations until we can establish AFSPC policy. It is the intent of the Air Force, by means of documentation in the installation Wildland Fire Management Plan (WFMP), to establish the physical fitness criteria (arduous, moderate, light) applicable to the installation and specific duties (FFT2, FFT1, Burn Boss, Ignition Specialist, Sawyer, etc). These determinations should be made when the WFMP is developed based on PMS-310, <http://www.nwccg.gov/pms/docs/docs.htm>, but may take into account installation terrain, elevation, function (prescribed burning, hot shots, initial attack, etc), and complexity (i.e.; Southeast vs. West) to adjust the fitness level to what is realistic. This is a operational risk management decision with potential liability issues and should be fully analyzed and documented.

2. Regardless of fitness levels, personnel must have wildland fire duties (primary or secondary) and fitness requirements reflected in their core doc, PD, or NSPS performance objectives and must take the appropriate pack test initially after basic training (S-130, S-190, IC-200, etc) and then annually (see attachment) along with refresher training requirements that are established in the WFMP again based on PMS-310 or the NIFC equivalent for GS-081 structural firefighters. Reference AFI 32-7064, Chapter 12, <http://www.e-publishing.af.mil/pubfiles/af/32/afi32-7064/afi32-7064.pdf> .

3. Red Cards may be issued to Air Force personnel meeting Moderate or Light fitness standards for on-base work; however, personnel not meeting "Arduous" would not be eligible for National assignments or off-installation (non-AF) cooperative work. Pack tests should be administered annually by qualified personnel and ideally would test all participating personnel at the same time and location. The installation Fire Chief or Designated Wildland Fire Manager per the WFMP should certify this on the red card or memo for record.

4. Lastly, AFCEE is meeting with AFCEA/CEX at Tyndall AFB to discuss incorporation of current stand alone IQS Wildland Fire Database into the DoD Firefighter Certification System. Stand by for more on this. Please let me or Kevin Porteck at AFCEE, DSN 240-5631, know if you have any questions regarding CEV participation in wildland fire management activities. CEF personnel should contact John Staub, AFSPC Command Fire Chief, at DSN 692-5112.

//SIGNED//

Stan Rogers
Command Natural Resources &
Conservation Law Enforcement Program Manager
HQ Air Force Space Command

OTHER POSITION ASSIGNMENTS THAT WILL MAINTAIN CURRENCY

Any higher position for which this portion is a prerequisite.

OTHER TRAINING WHICH SUPPORTS DEVELOPMENT OF KNOWLEDGE AND SKILLS

None

16.0 Environmental Impact Analysis Process for WFMP Implementation

As a federal agency, the 45 SW is required by the National Environmental Policy Act (NEPA) to assess the potential impacts to the environment that could result from their proposed actions. One such action is implementation of the 45 SW WFMP. As a component of the 45 SW INRMP, the WFMP has been assessed in the Environmental Assessment (EA) for the 2007 revision of the INRMP. This EA includes wildland and prescribed fire activities addressed in this WFMP. The INRMP concluded with a Finding of No Significant Impact/Finding of No Practicable Alternative (FONSI/FONPA). In addition, a Programmatic EA for land clearing activities was completed that included, among other things, mechanical treatment and control burning for scrub restoration. This EA concluded with a FONSI/FONPA dated 26 May 2005.

The actions described in the WFMP are similar to actions addressed in the INRMP EA and the Programmatic Land Clearing EA; therefore, the WFMP qualifies for Categorical Exclusion A2.3.11, as defined in 32 CFR 989, Attachment 2 (see Tab O of the INRMP for NEPA documentation).

17.0 References

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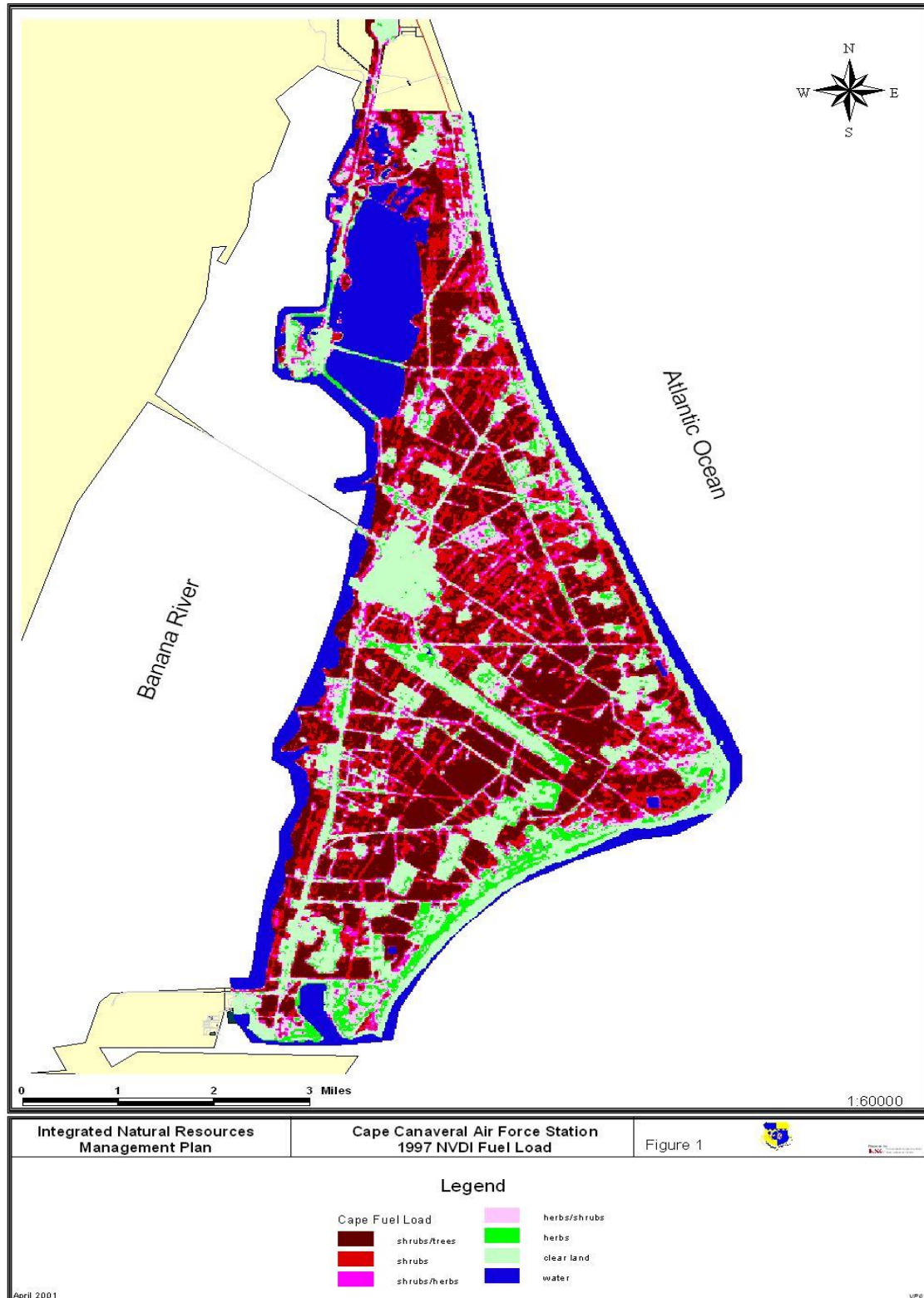
Schmalzer, P.A. and C.R. Hinkle. 1992. Species Composition and Structure of Oak-Saw Palmetto Scrub Vegetation. *Castanea*, 57 (4): 220-251.

Acronyms

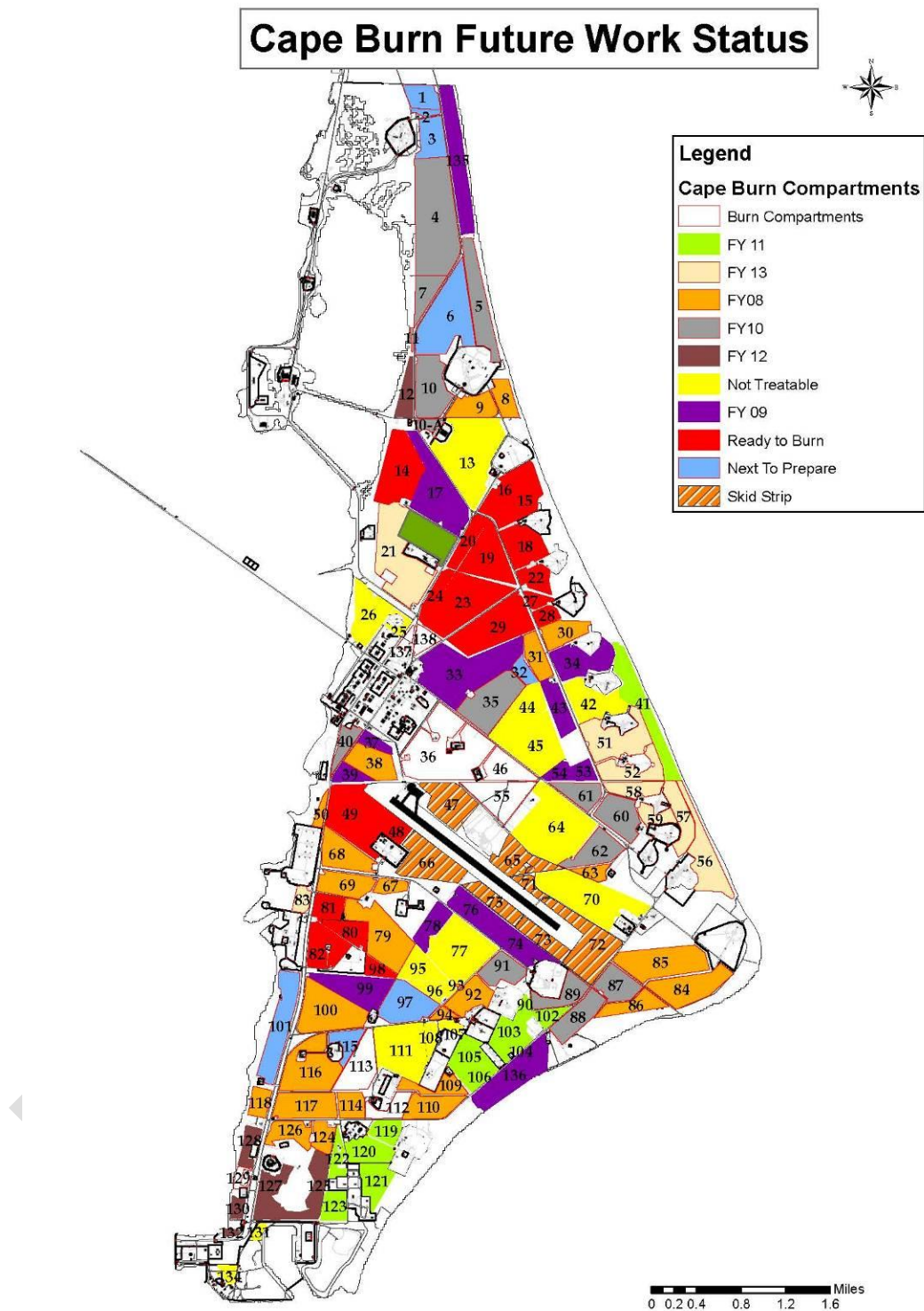
45 SW	45 Space Wing
ABS	Archibald Biological Station
AF	United States Air Force
AICUZ	Air Installation Compatible Use Zones
BCP	Base Comprehensive Plan
BO	Biological Opinion
CATEX	Categorical Exclusion
CES	Civil Engineering Squadron
CEV	Environmental Flight (of CES)
CEVP	Conservation Element (of CEV)
CCAFS	Cape Canaveral Air Force Station
DEL	Delivered
DoD	Department of Defense
DRMO	Defense Reutilization Marketing Office
CZMA	Coastal Zone Management Act
EELV	Evolved Expendable Launch Vehicle
EIAP	Environmental Impact Analysis Process
ESA	Endangered Species Act
ESC	Environmental Support Contract(or)
FNAI	Florida Natural Areas Inventory
FWCC	Florida Fish and Wildlife Conservation Commission
USFWS	U.S. Fish and Wildlife Service
GIS	Geographical Information System
INRMP	Integrated Natural Resource Management Plan
ICRMP	Integrated Cultural Resource Management Plan
IRA	Interim Removal Actions
IRP	Installation Restoration Program
JBOSC	Joint Base Operations Support Contract
JDMTA	Jonathan Dickinson Missile Tracking Annex
JDSP	Jonathan Dickinson State Park
KSC	Kennedy Space Center
LC	Launch Complex
MHW	Mean High Water
MINWR	Merritt Island National Wildlife Refuge
MSL	Mean sea level
NCRC	Natural & Cultural Resource Contract(or)
NEPA	National Environmental Policy Act
NFRAP	No Further Remedial Action Planned
NTD	NASA Test Director
NWI	National Wetlands Inventory
PAFB	Patrick Air Force Base
ROCC	Range Operations Control Center
SOW	Statement of Work
SJRWMD	St. Johns River Water Management District
TNC	The Nature Conservancy
UCF	University of Central Florida
USAF	United States Air Force

Attachments

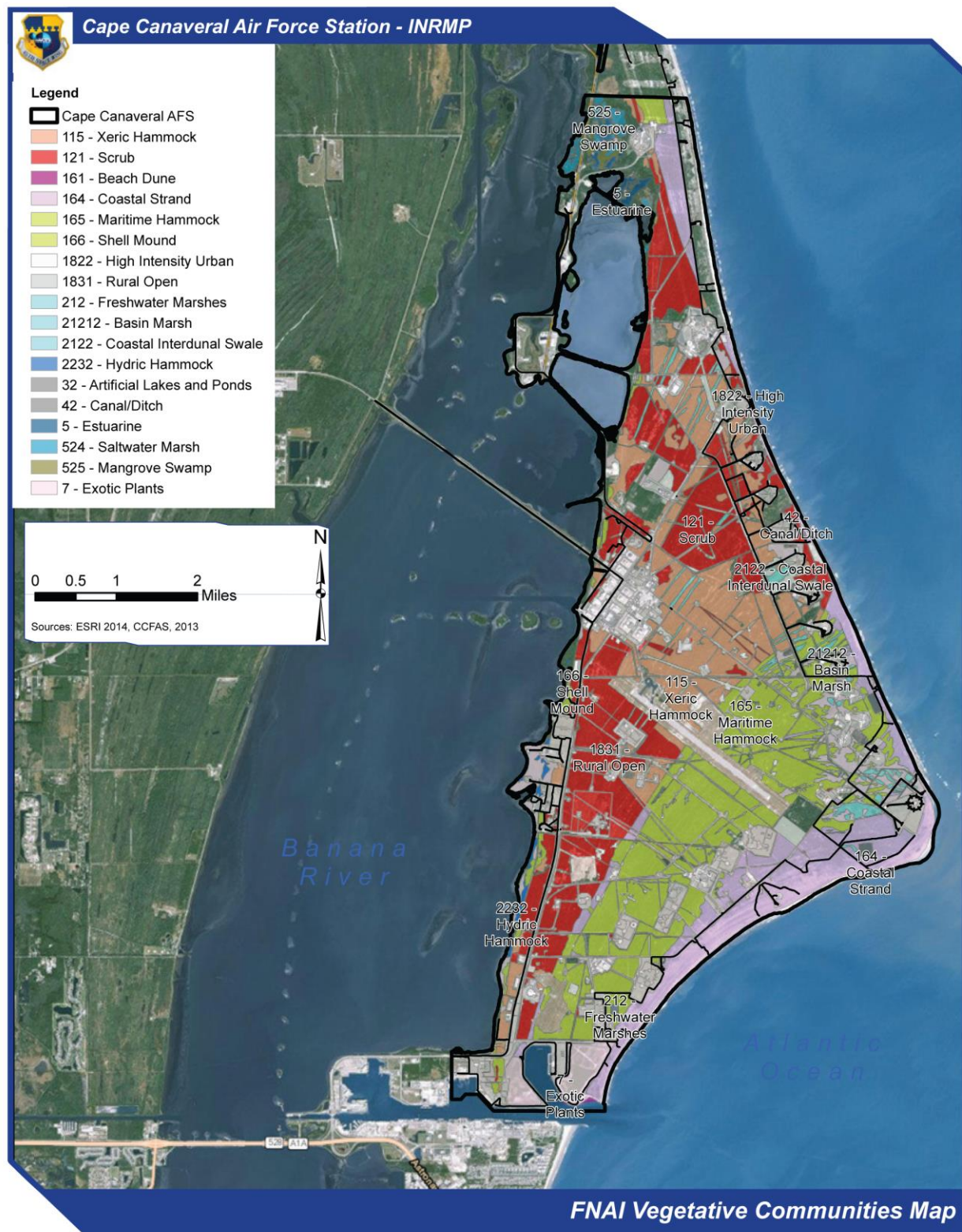
- J-1 CCAFS 1997 Fuel Load Map
- J-2 Cape Land Management Unit Status Map
- J-3 Cape Future Burn Work Status Map
- Vegetation Maps (2014)
- J-4a CCAFS Vegetation Map
- J-4b PAFB Vegetation Map
- J-4c MTA Vegetation Map
- J-4d JDMTA Vegetation Map
- J-5 Prescribed Burn Process Flowchart
- J-6 45 CES Prescribed Burn Coordinator Checklist
- J-7 Natural and Cultural Resource Checklist for Prescribed Fire Activities
- J-8 Burn Supervisors Burn Prescription Process
- J-9 Sample Prescribed Fire Plan
- J-10 SGS Duty Office Instruction (DO-I-16) Controlled Burn Notification Procedure
- J-11 SGS Controlled Burn Notification Checklist
- J-12 MTA Prescribed Burn Compartments Aerial Photo (FFS)
- J-13 Distribution List

**J-1: CCAFS 1997 Fuel Load Map**

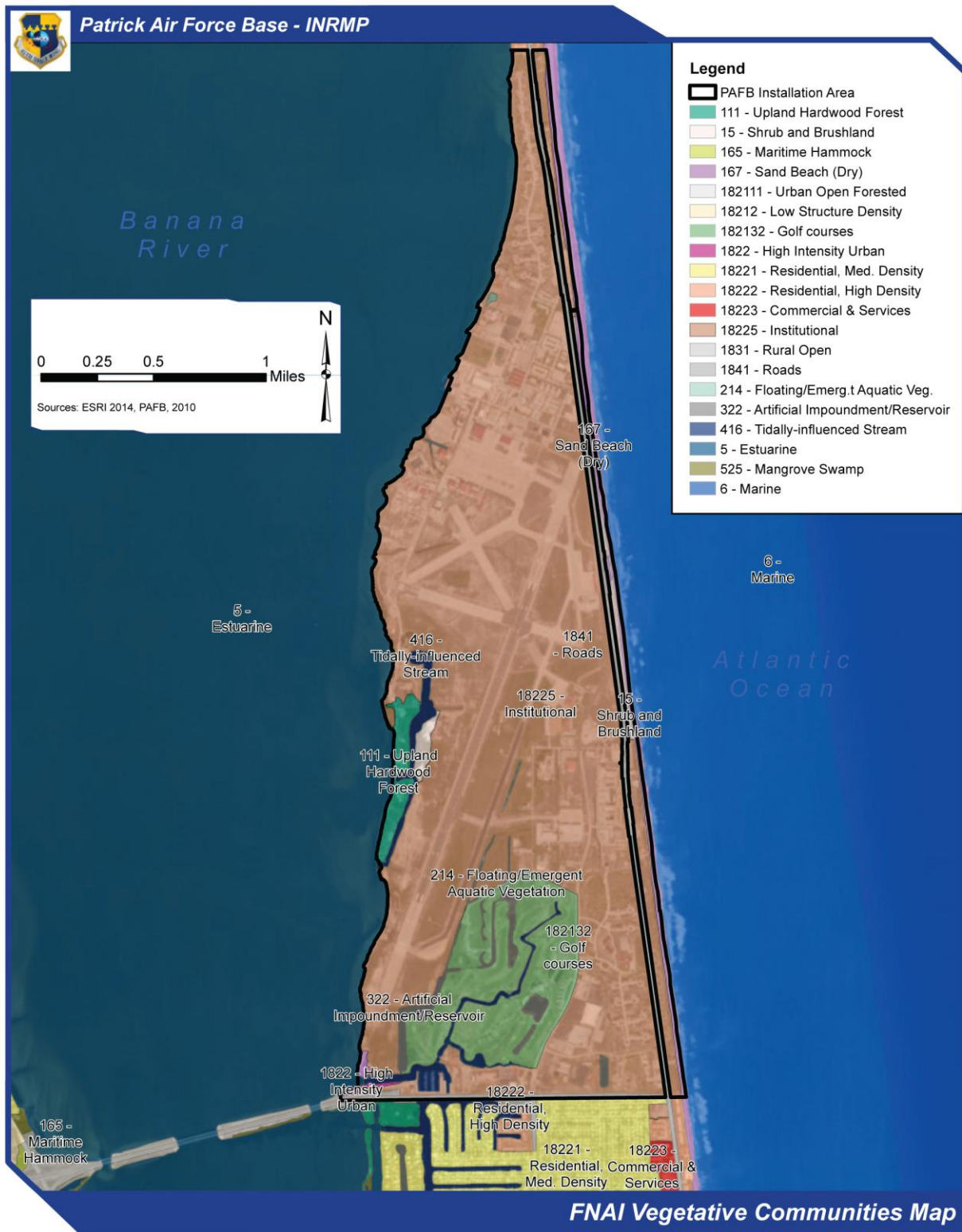
**J.2: CCAFS Land Management Units (2014)**



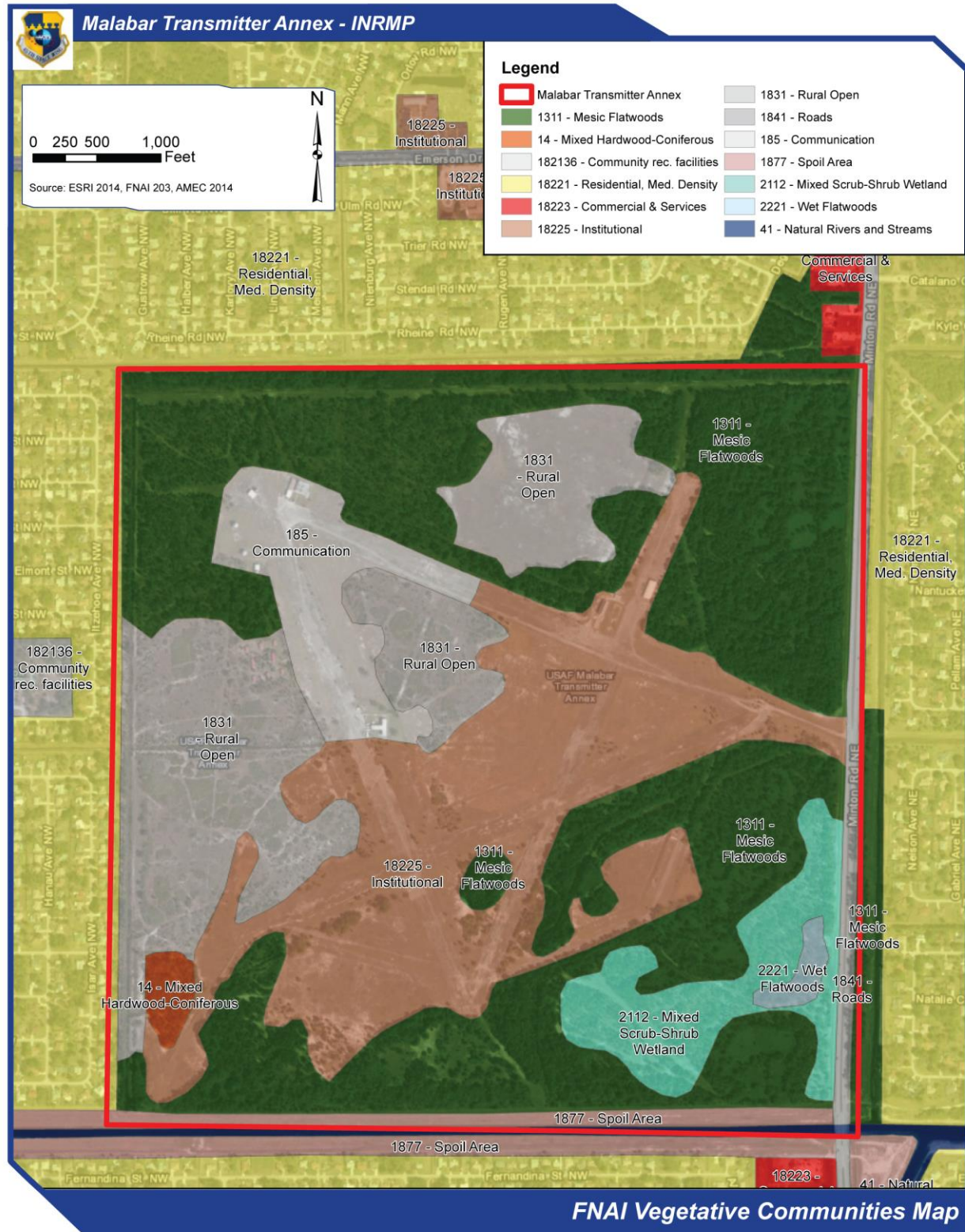
J.3: Cape Future Burn Work Status (2008)



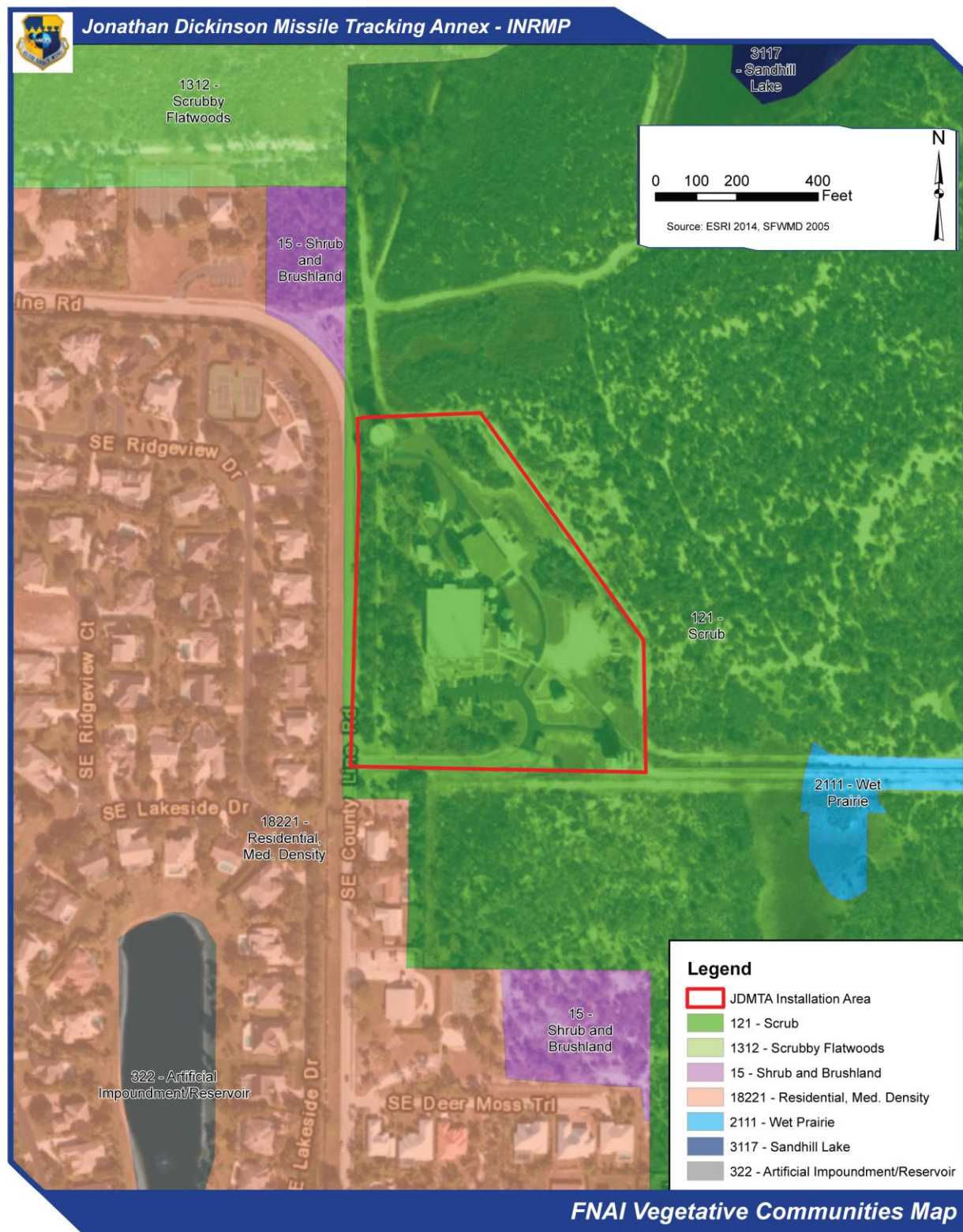
J.4a: CCAFS Vegetative Communities



J.4b: PAFB Vegetative Communities

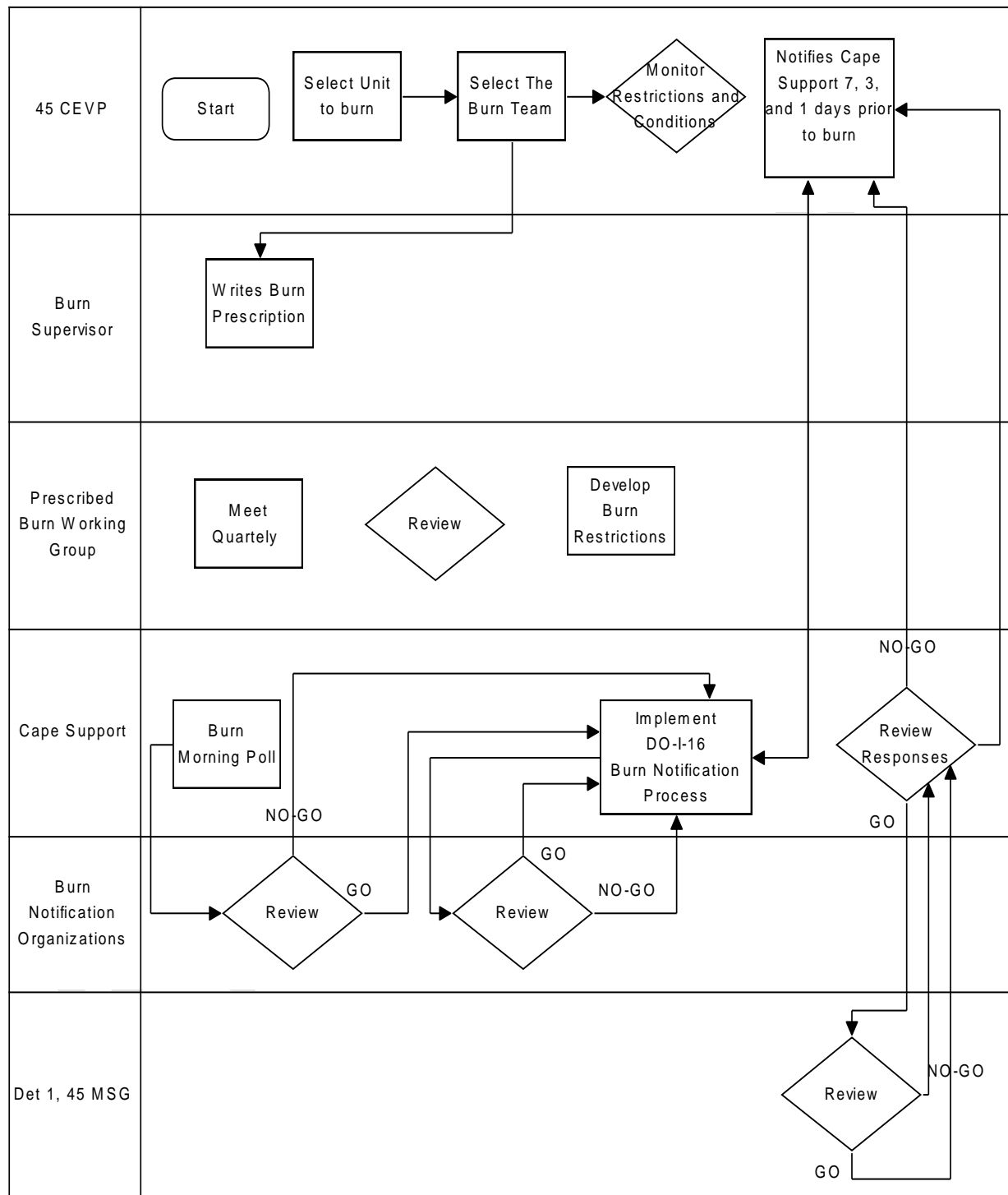


J.4c: MTA Vegetative Communities



J.4d: JDMTA Vegetative Communities

Prescribed Burn Process Flowchart



J-5: Prescribed Burn Process Flowchart

J-6: 45 CES Prescribed Burn Coordinator Checklist

Completed **Prescribed Burn Coordinator Checklist**

1 + Week (s) Prior

Weather Check (NWS, Air Force Weather – 45 WS)
Planning of which Units to burn (PBWG minutes)
Notification to Duty Office/Cape Support
Det 1 Update (Weekly)
Call Range Scheduling for update (Dale or Mabel only @3-5941)
Notify Sarah Linney FNAI Scrub Jay Monitoring
Manning (CEVP, Spec Pro or USFWS)
Call FP&L if powerlines located in units Mark Hillman cell 431-2742
Operational Restrictions

1+ Day(s) Prior

Weather Check
Establish Team and duties (camera detail, whoever drives truck)
Have Duty Office send out 1 Day Notice with forecasted weather
Safety Pre-Brief (can be sooner than 1 day)
Contact Facility Managers in areas affected by burn
Inspect equipment, ensure ATVs (all vehicles) are fueled
Purchase fluids (water, gatorade)
Print maps
Check radios, replace batteries, pack extras
Refresher on trucks/hoses
Tour LMU's for familiarity
Pick up AED from Greg Smith 4-4650 PAFB Electrical Shop

Day of Burn

Weather Check
Call SpecPro for confirmation
Call Duty Office to initiate verbal go-no go
Pick up equipment from Firehouse
Pick up cooler and stock with ice and fluids
Make more notifications depending on LMU (i.e., AFTAC, FM's etc)
Bring maps, radios, extra masks, camera
Bring Mabel's Motorola radio

Upon Confirmation of a GO Decision

Confirm with Det 1
Call SGS Security at 853 - 2159 Watch Commander
Call SGS Fire at 853 - 9251
Call Terry Bracher at 494 - 9262 and have her notify PA (4-5933)
Call USFWS at 861-6695 Glen Stratton or 867-2412 Cynthia Branham for not. only
Have Duty Office make aural warning announcement
Call Duty Office upon ignition (test fire)
Safety Briefing
Photos of Preburn Habitat

Post Burn Activities

AAR
Photograph Compartment
Check equipment, refuel
Return AED

J.7: Natural and Cultural Resources Checklist for Prescribed Fire Activities**Natural and Cultural Resource Checklist
For Prescribed Fire Activities**

Compartment(s) to be burned: _____

Proposed Burn Date(s): _____

1. List the species utilizing compartment: _____

2. Are any of the above species listed as Endangered, Threatened or a Species of Special Concern? List the species

2a. Describe any actions needed prior to and during the burn (field survey, consultation w/ USFWS etc).

3. List the resident and migratory bird species utilizing compartment

4. List any birds currently nesting in the compartment:

5. List any cultural or historical resources located in the compartment

5a. Describe any actions needed prior to and during the burn

J-8: Burn Supervisor's Burn Prescription Checklist

Burn Supervisor's Burn Prescription Process

The following specific topics are planned and documented in the Burn Prescription.

1. Certified Burn Manager Number and Customer Number with Florida Division of Forestry
2. Location, Section Range Township of burn site
3. Land Owner ID number
4. Number of acres to be burned
5. Unit ID number
6. Physical Features and Vegetative Cover Types (specific species, height, density)
7. Primary Objectives of the burn
8. Land Management Goals
9. Complexity Analysis
10. Site Preparation
11. Safety Considerations
12. Communications Includes 2 way radios and radio checks pre burn. (UHF and VHF radios are used)
13. Ignition and Fire Control Specifics (Ignition method, sequence, Time of day, "dependent on fuel moisture" Holding capability, manpower, Engines, tractors)
14. FBPS Fuel Model or Models that represent the fuel type
15. Weather (air Temp, relative humidity, wind speed /surface mid flame transport/ cloud cover Dispersion Index daytime and night, KBDI, Live and Dead fuel moisture,
16. Fire Behavior predictions, Type, Rate of Spread, Fire-line Intensity, Flame Length, Energy Release Component
17. Smoke Management, Wind Direction, Mixing Height, Transport Wind speed and direction

18. Notifications, Florida Division of Forestry (Permit Request), Brevard County Emergency Management (Central Dispatch) Merritt Island National Wildlife Refuge

19. Contingency Plan for Escape Fire

20. Resource Roster, Personnel, (equipment / Engines Tractor plow units/Aircraft / Ignition devices)

21. Mop up operations

22. Traffic based on the Max LVORI (visibility restrictions calculations) Warning Signs and or Traffic Detour as may be required

There is a mandatory Pre Burn briefing conducted 1 to 2 days prior to the burn day, There is a mandatory Pre Burn briefing the morning of the burn on the site. There is a debriefing or “After Action Review” of the Burn after the site is declared safe, this is for Lessons Learned information cross-talk and ID of improvements

This includes site scouting, identification of escape routes and Safety Zones.

All Personnel Must have completed at a minimum S130 and S190 training to participate and or be on the Fire Ground.

Command and Control of the operation is assigned to a “Fire Boss”. This person must be certified by the State of Florida Division of Florida as a Certified Burn Manager.

This person must pull the permits, and is overall responsible for all personnel and burn related activity. The Fire Boss is also the person that can declare the Burn site SAFE, at the end of the burn.

J-9: Sample Prescribed Fire Plan

SPECPRO, INC.
Forestry Division
Sample PRESCRIBED FIRE PLAN

<u>LOCATION CCAFS</u>	<u>FIRE AUTHORIZATION #</u>
<u>Fire Boss</u>	<u>K.D. Burkett</u>
<u>Certified Burner Name and Number 033258</u>	
<u>Date of Burn 20, May, 2006</u>	

Section 31 Range 38E	Township 22S	Landowner number xxxxxxxx
Customer # 306622	Last burn #	
Acres To Be Burned 42	Unit ID	8

GENERAL DESCRIPTION OF BURN UNIT

PHYSICAL FEATURES and VEGETATION COVER TYPES (SPECIES, HEIGHT, DENSITY)
Scrub Oak and palmetto rough on Canaveral Complex Soils. Widely dispersed clumps of Brazilian Pepper monoculture are throughout the area. In addition the coastal scrub running from South of the SLC 37 to the extension of Patrol road and east to the Beach.

PRIMARY OBJECTIVES, LAND MANAGEMENT GOALS

Burn out unit 8 as a result of fire started from launch.

ACCEPTABLE RANGE OF RESULTS

To allow the consumption of all fuels that will burn, while maintaining fire within unit 8.

COMPLEXITY ANALYSIS RESULTS

Complexity of this burn is moderate due to restrictions of smoke management and infrastructure Located to the North and west of the site.. Escape potential is moderate.

SITE PREPARATION

Hard lines established around critical infrastructure.

WEATHER INFORMATION REQUIRED

Spot forecast in real time. On site measurements will be conducted.

SMOKE MANAGEMENT CONSIDERATIONS, SMOKE SENSITIVE AREAS

Smoke is a critical concern, Burn will only be conducted if smoke will not impact smoke sensitive facilities .

SAFETY CONSIDERATIONS

Escape routes will be to the boundary roads and the black areas.
Request for aid from US Fish and Wildlife MINWR if conditions warrant.

COMMUNICATIONS

CCAFS notification process
Phone call to Merritt Island Refuge
Operations using UHF 2 way radios
Cell phone will be available on site

CCAFS Fire Department will provide additional portable radios.

IGNITION AND FIRE CONTROL

Time of Day ignition will begin as early as possible dependant on fuel moisture, 8:30PM

FBPS FUEL MODEL OR MODELS 7

AIR TEMPERATURE 70 degrees low to 90 degree as high.

RELATIVE HUMIDITY less than 70 %

WIND SPEED 20' FORECAST

WIND SPEED MID-FLAME forecast

WIND DIRECTION : optimum winds will be from 240 degrees or N not to exceed 300 degrees. Secondary winds would be from 120 to 210 degrees. **Winds other than prescribed will not be allowable for this Rx.**

CLOUD COVER CL

DISPERSION INDEX DAYLIGHT HOURS >15

DISPERSION INDEX NIGHT TIME HOURS >10

KBDI INDEX <700

FUEL MOISTURE 1 HR 73 to 110

TYPE OF FIRE PRESCRIBED Backing, head, strip head, spot, flanking

RATE OF SPREAD, CHAINS/HOUR 20-30

FIRELINE INTENSITY 600 BTU / ft²

FLAME LENGTH 5 - 12

ENERGY RELEASE COMPONENT 15-35

IGNITION PROCEEDURE

ATTACH MAP

Perform test fire along downwind leg of compartment. With test fire conducted satisfactory, start black line establishment along downwind fire break. Fire flanks up even on each side and strip out compartment cuts using eng 99. Continue working into the wind.

FIRE CREW AND ORGANIZATION

FIRE BOSS

Ken Burkett

Personnel

Equipment

Other Available Resources

Eng 5

DOF notified for stand by

Eng 99

Air Force

Eng 77

Tractor 96

SMOKE MANAGEMENT

WIND DIRECTION Winds from the south west 240 to west north west clockwise are optimum.

TRANSPORT WIND DIRECTION NE @ 10

TRANSPORT WIND SPEED NE @ 10

MIXING HEIGHT; NOT LESS THAN 1700'

ACTIONS TAKEN OR PLANNED TO REDUCE VISIBILITY HAZARDS

Deploy smoke warning traffic signs.

RESIDUAL SMOKE PROJECTIONS, AND ANTICIPATED PROBLEMS

Smoke residuals are projected to be low.

NOTIFICATIONS

Standard CCAFS

CUSTOMER COORDINATION 45 CES / CEIE-C

CONTINGENCY FOR ESCAPE

Adjacent fuels: Main hazard will be rough to the south-west of fire break along west flank of compartment 8.

Escape Actions: When spot over fires are noticed, firing will cease immediately. Fire Boss will be notified of all **Spot Over Situations**, location, and size. First responding suppression units will commit engines and or tractors as deemed needed to contain the fire. If helicopters are present for the fire aerial suppression bucket water drops can be called for. All personnel will follow **standard fire orders**.

Specific action plans

To be briefed on site.

SAFETY

The safety of all personnel on the ground or in the air is the NUMBER ONE PRIORITY!!!!

Protection of private property and or critical infrastructure is the second priority. All personnel will wear the required PPE for their particular fire assignment. This includes fire shelters, hard hats, gloves, goggles, and full nomex. All personnel will consider escape plans, escape routes, during all phases of fire operations.

MANDATORY SAFETY BRIEFING ALL PERSONNEL

ESCAPE ROUTES

South along old A1A

West on Patrol Road or along SLC 37 perimeter

All Black areas will be considered safety Zones

SAFE ZONE LOCATIONS

No Specific Safety Zones will be constructed for this fire. .

All personnel will remain alert to fire line hazards, fire location, and fire behavior. When fire operations are adjacent to open roads or highways all equipment will use traffic warning lights on vehicles.

Any movement of resources will be coordinated through the FIRE BOSS.

SPECIAL CONSIDERATIONS

SITE SPECIFIC

CCAFS fire Chief or designated command officer will be in overall charge of this fire.

PRESCRIBED FIRE CHECKLIST AND CREW BRIEFING

SEE ATTACHMENT

COMMUNICATIONS

Communications via 2 way radios will be used for all fire operations

Prior to reporting to the fire site, Verify radios are operational.

A radio channel will be assigned at the crew safety briefing, all personnel will perform a radio check on this channel prior to the start of operations. Verify that each person has a full set of new batteries for their radio.

There will be a minimum of one cellular telephone on site at all times.

Firing Technique and Sequence

Specific firing orders;

Downwind flank will be ignited and allowed to back burn to establish the black line. This will be followed by black line of the parallel flanks at approx. 3 chains per segment equally. Strip head fire may be set across the unit at 3 to 5 chain intervals to accomplish burn out.

Burn Objectives

The objective of these burns will be to reduce fuel load and to top kill scrub vegetation to enhance Scrub Jay habitat.

PREDICTED FIRE BEHAVIOR

Early in the day

Afternoon

Expected RH change high 0400 hrs and low at 1400 hrs

Expected flame length >5 ft.

Expected ROS at lowest RH and winds of 16 mph 15 – 25 ch/hr

SPOTTING POTENTIAL: Moderate

OTHER FIRE BEHAVIOR: areas of slow spread and backing . May require manual burn out .

This fire prescription is fully planned and is compliant with all rules and regulations that apply to open burning in the state of Florida. The certified burner herewith certifies that all plans and contingencies have been met for this Rx burn by their signature and CBN below.

_____ date _____

J-10: SGS Duty Office Instruction (DO-I-16) Controlled Burn Notification Procedure**SUBJECT: Controlled Burn Notification Procedure.**

PURPOSE: To establish policy and provide guidance for receipt, distribution, and coordination of controlled burn information.

SCOPE:

1. This procedure applies to all personnel in the SGS Duty Office. Those employees represented by a Collective Bargaining Agreement (CBA) should refer to their CBA for provisions that may apply to their assigned classification. Should conflict arise between this policy and the appropriate CBA, the collective bargaining agreement will prevail.

2. All work on this procedure is to be computer based and stored on the Y drive.

DEFINITIONS: N/A

CBA – Collective Bargaining Agreement
CCAFS – Cape Canaveral Air Force Station
KSC – Kennedy Space Center

REFERENCE DOCUMENTS:

TRI-Agency MOU for Controlled Burns
DO-I-01 SGS Duty Office Operations
WCC-P-0007 SGS Duty Office Procedures

QUALITY RECORDS: N/A**PROCEDURE:**

1. SGS Duty Office will receive controlled burn information via email from US Fish & Wildlife and or 45 Space Wing Civil Engineering Squadron Conservation Environmental Planning Office CCAFS (45 CES/CEIE-C). The information provided will be a written description of the burn and a map image of the area to be burned. Duty Officer will save the map image to the Y drive. (Y:\Cape Apps\Cape Support\#SGS Duty Office Control Burns\ (current year) folder).

2. The Duty Officer will take the information and put it into MS Word Control Burn Update memorandum format, open a blank update located on the Y drive titled Blank CCAFS Update or Blank KSC Update. (Y:\Cape Apps\Cape Support\#SGS Duty Office Control Burns\ (current year) folder).

3. Once the memorandum has been initiated, save the document to the Y Drive. Example: Control Burn Update #200403-01. This indicates it is a Control Burn Update the number 2004 for the year, 03 for the month, and the -01 for the first update of the month.

4. **Sending the Controlled Burn Update via E-Mail.** When the memorandum is complete, have another Duty Officer review the Update prior to sending. Once it has been reviewed, send

the Update as an attachment. Attach the map image to the email. In the subject field ensure that it states “*proposed control burn*” with the location, date and time of the burns are included in the subject line.

(Example for block time frame: Proposed Control Burn CCAFS/KSC 20 April – 20 July 2004)

(Example for specific time frame: Proposed Control Burn CCAFS/KSC 20 April 2004 at 1300E)

Click on the options button of the email and click the request delivery and read receipts, also click on the red exclamation point for high priority marker. Then send the email. Once the email is sent, the sender will receive all the distribution receipts and read receipts in your email box continue with steps 5 through 7 for logging the receipts.

5. Once the message is sent the Duty Officer coordinating the burn will open the Blank Controlled Burn Notification Checklist excel spreadsheet, located in the Y drive, (Y:\\Cape Apps\\Cape Support\\#SGS Duty Office Control Burns\\ (current year) folder) and do a “save as” using the numbering sequence used as explained in paragraph 3 above. Example; 200403-01 Controlled Burn Notification Checklist.

6. The Controlled Burn Notification Checklist is used to log in the Distribution Receipts and the Read Receipts as a permanent record of email traffic during the burn process. **All work will be logged in and stored in the computerized form only.** Use the following to annotate the actions taken:

DF	Distribution Failed
X	For normal email distribution and email read
NR	For email not read
OOO	For Out Of Office reply message

7. **The Duty Officer coordinating the burn is responsible for monitoring all feedback from organizations on the distribution list and providing liaison between those agencies and the burning agency for any issues or concerns with the upcoming burn.** The Duty Officer coordinating the burn is responsible for providing assistance to resolve any issues at the Duty Office level, if the issue cannot be resolved forward the issue to the POC/agency responsible for the burn for further coordination. In addition forward all email traffic concerning the burn back to the agency responsible for the burn so that they are advised of any and all issues concerning the burn. In order to maintain a record of the concerns insert a comment in the GO/NO-GO column next to the person’s name on the Controlled Burn Notification Checklist, cut and paste or type in the issue that the person or agency has concerning the burn. Also include any resolution if it has been resolved or work in progress to resolve the issue.

8. If the original update message was sent out covering a large block of time, (example: an organization that will be burning several compartments between 15 April thru 20 July) **an additional Controlled Burn Update for the specific area to be burned will be required once the burning agency locks in a specific date.** This will be done on an additional Update memorandum saved in the Y drive as indicated in paragraph 3 with the addition of a (R1) at the end of the number (example: 200403-01 would be saved as 200403-01R1).

9. The day of the burn the Duty Officer coordinating the burn will contact the 45 Space Wing Weather Squadron at 853-8484 to verify the weather forecast for wind direction. Log this

information onto the Controlled Burn Notification Checklist in the wind information block. This information will be required during the verbal polling with the GO/NO-GO agencies.

10. The Duty Officer coordinating the burn will contact the prime or alternate points of contact for each of the agencies highlighted in blue on the Controlled Burn Notification Checklist, and log all verbal GO/NO-GO responses. **Starting from the top** of each group and working to the bottom of the list finishing with the final approval authority in each group (for CCAFS it will be the Base Commander or alternate representative, for KSC it will be then NASA Test Director or alternate representative). Also highlight the person's name in yellow that passed the GO/NO-GO response so we have a record of who passed the GO/NO-GO for each group. If an alternate to the approved list is used insert a comment block and fill in the name of the person who passed the GO/NO-GO and why the alternate to the approved list was used.

11. If any agency responds with a NO-GO record the reason for the NO-GO and continue with contact list. Brief the final approval authority of all GO/NO-GO responses and reason for any NO-GO. The final approval authority for each group may override the NO-GO. If a NO-GO is overridden the Duty Officer will inform the NO-GO agency of the decision so that they can coordinate their concerns directly with the final approval authority. In the event of a CCAFS to KSC GO/NO-GO issue the SGS Duty Office will coordinate a telecom between the two final approval authorities and the burning agency to resolve the GO/NO-GO issue. If no immediate resolution can be resolved then the burn will be cancelled.

12. For controlled burns that will take place over the weekend, the GO or NO-GO calls will be made on the Friday prior to the burn. The Duty Officer will ensure that the approval authority understands that they are making the approval for the burn that will happen in the future based on known conditions at the time of notification. Also the Duty Officer is required to coordinate with the NTD, CTC, USA and JCCC Consoles after coordinating with the burn agency the morning of the burn.

13. Once all verbal responses have been logged and a GO or NO-GO has been issued, the Duty Officer will contact the burn agency and pass the GO or NO-GO for the burn.

14. For Controlled Burns on CCAFS, the Duty Officer will make a public address announcement concerning the burn using the Cape Aural Warning System. The announcement needs to include enough information so that personnel will understand where and when it will happen.

Example: *"Your attention please to the following Controlled Burn announcement. There will be a controlled burn of compartment 40 today starting at 1000E. The location for the burn is east of Phillips Parkway and directly south of the industrial area fire station"* Repeat

J-11: SGS Controlled Burn Notification Checklist

CONTROLLED BURN - NOTIFICATION CHECKLIST		SGS Duty Office
DATE/TIME OF THE BURN:	POC FOR THE BURN:	ORGANIZATION:
BURN DESCRIPTION:		

WINDS:

NASA Space Shuttle

DEL	READ	VERBAL GO/NO-GO	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			Prime: Myrick, Don	NASA Safety	861-1680			
			Alt: Hughes, Charles		861-5173		431-5017	
			Prime: Bryan, Robert	Shuttle Landing Facility	867-2100	232-7138	536-7780	861-0331
			Alt: Feile, Ronald		867-2100			861-0331
			Eriksen, Wilbur M / Mike	CMT (Rail Siding)	867-2607	232-7415	749-5966	861-1223
			Alt: Andrade, Tony		867-3261	232-7334	749-0946	867-3479
			NTD Duty Desk	NASA	861-6831			
			NTD Zeno, Danny		861-8240			867-7648
			Alt NTD Woodward, James (Spencer)		861-9319			867-7648
			Alt NTD Graeber, Jeremy		861-9349			867-7648

NOTE: Begin at the top of the list and work down, the last office contacted will be the NTD in bold type once all other notifications have been received.

NASA Payloads (Non Shuttle)

DEL	READ	VERBAL GO/NO-GO	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			Prime: Dovale, Charles	NASA LSP VA-2	867-1310			
			Alt: Baez, Omar		867-1309			

45 Space Wing

DEL	READ	VERBAL GO/NO-GO	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			Prime: Capt Florence, Dwayne	1 SLS Delta II	853-4530		750-2534	
			Alt: Capt Dillard, Liza		476-3074		749-3427	
			1 SLS DDO		684-3747			
			Prime: MSgt Shank, Thomas	45 LCSS Spacecraft Support	853-4095		684-3756	476-2719
			Alt: MSgt Linder, Ron		476-2678		480-2061	
			DDO		N/A		759-8085	
			Prime: TSgt Jackson, Michael	5 SLS EELV	730-6322		543-1432	
			Alt: TSgt Cleaver, Jay		730-6293			
			DDO		652-7962			
			Prime: MSgt Harmon, Randall C	AFELM/LCO	730-6221	877-687-8644	652-1564	730-1213
			Alt: Maj Gunn, Larry		730-6210	888-499-5992	205-3476	730-1213
			Pomeroy, Randy	AFTAC GS-13 DAF	494-2354	232-9755	544-6805	494-2560
			Prime: Bron, Terry	45 OSS Skid Strip	853-4242		446-2527	853-1521
			Alt: Struzinski, Frank		494-4323		446-9946	494-0354
			#LOSC MOCC	LOSC	853-8100			853-8966
			JCCC (Notification Only)	RPI	867-7627			
			Wing Cmd Post (Notification Only)	45 SW	494-7001			
			Maj Quigg, Robert	Det-1 CC	853-3900	232-8271	431-4533	853-4510
			Maj Lindsey, Greg	Deputy Det-1 CC	853-3900	232-7082	266-3438	
			Witt, Elbert	Alt Det-1 Deputy/CC	853-3900	232-7045	431-4527	853-4510

NOTE: Begin at the top of the list and work down, last office contacted is the CCAFS Cape CC in bold type once all other notifications have been made.

CONTROLLED BURN NOTIFICATION CHECKLIST					SGS Duty Office			
DEL	READ	Notification Only	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			1st Space Launch Sqd CC	1 SLS	853-4570			
			5th Space Launch Sqd CC	5 SLS	730-6355			
			45 Launch Support Sqd CC	45 LCSS	853-9071			
			45 Operations Support Sqd CC	45 OSS	853-2261			
			45 Weather Sqd CC	45 WS	494-7426			
			45 WS Cape Canaveral Weather Operations	45 WS/DOR	853-8484			
			Allison, Mark	LOSC	853-3339			
			Anderson, Richard	SGS Fire Dept Deputy Chief	476-5515	232-7654	759-5114	853-9788
			Baez, Omar	NASA	867-1309			
			Ballou, David	LMA	853-5115	635-4871		
			Balser, Joseph	LOSC	853-8100			
			Bartelson, Don	LOSC	853-5958		750-2700	
			Bass, Robert	FPL				
			Beach, Jeff	NASA Safety	867-6551			
			Branham, Cynthia	USFWS	861-0846			861-0510
			Buckingham, Bruce	NASA/PAO	867-2468			
			Buckley, Jason	ULA / Boeing EELV	476-4709		720-5182	
			Burkett, Ken	ESC/SPEC Pro	853-6857		403-9032	
			Busacca, Mario	NASA Environmental	867-8411			867-8040

CONTROLLED BURN NOTIFICATION CHECKLIST					SGS Duty Office			
DEL	READ	Notification Only	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			Callier, Diane	NASA Environ Prgm	867-4280			867-8040
			Camardese, Michael	45 CES/CEIE-C	853-0910			853-5435
			Carroll, Matthew J	NASA-UB-Facilities	867-6030	232-5267		867-6570
			Chewuk, John P.	LMCO	730-6219	877-667-2041		730-6121
			Collins, Joyce	FPL	726-4938			
			Crawford, Will	Boeing EELV	730-5562		749-8787	
			Davies, Frank	45 RMS/RMOE	853-2897			
			Dean, Charles R	SGS Cape Utilities O&M	853-6469		749-0427	853-2990
			Decloedt, Derek	Boeing	730-5563			
			Deliz, Mike	NASA Environmental	867-6971			867-8040
			Eaton, David B.	45 OSS	853-1036	480-0844	730-6206	853-7172
			Everhart, Chip	Boeing CAPPs-M&P	867-1650	232-1695		867-2947
			Foster, Tammy (Ecologist)	Dynamac	476-4118			853-2939
			Free, William	NRO	730-6325			
			Gomme, Wayne	LMCO / NRO	730-5158			
			Goodin, Ronnie	NASA				
			Grant, David	Boeing	476-3031			
			Grassman, Robert	FPL				

CONTROLLED BURN NOTIFICATION CHECKLIST					SGS Duty Office			
DEL	READ	Notification Only	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			Graves, Wade	NASA-VA-Facilities	867-0944			867-0707
			Gross, Charles	Aerospace Corporation	853-0835			853-3690
			Hall, Carlton R	Dynamac				
			Harmon, Randall C MSgt	AFELM/LCO				
			Hart, Robert		867-5176			
			Hawkins, Dale	45 CES/CEIE	853-6578			
			Hermanson, Scott	LOSC	853-8100			
			Higginbotham, Scott	NASA				
			Hillman, Mark	45 CES/CEL FPL Account Manager	494-7195	1-800-774-7609	431-2742	
			Ignacek, Julia	AFTAC, GS13, DAF	494-9079		501-1299	494-8389
			Ihde, Chris	Aerospace Corp (DSP Spacecraft Program)	476-2669	321-455-8488		853-3690
			Johnson, William R					
			Kamenetzky, Rachel	NASA-UB-M&P	867-6018	232-5138		867-6111
			Keener, Hugh	LMCO				
			Kern, Daniel	45 WS	853-8484			
			King, Gail	NASA Environmental	867-8442			867-8040
			Kler, Francis O.	Yang	867-9218			

CONTROLLED BURN NOTIFICATION CHECKLIST					SGS Duty Office			
DEL	READ	Notification Only	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			Berwanger, Patty	NOTU	853-2076			
			Madura, John	NASA	867-0814			
			Manguikian, Kimberly	NASA Environmental	867-8403			
			Marcotte, Toby G	FPL				
			Marsh, Dan	FPL				
			Mathias, Linda L	Analex	867-8605			
			McAlear, Jeff	USA, Mgr Test Ops	861-7146			861-5787
			McCormack, Don	LMA GPS IIR Launch Ops	853-7433			
			McCoy, Pamela	NASA				
			McDaniel, Bill	Boeing	867-5204			
			McKenna, Joseph	Boeing	853-9516	638-5890		853-1882
			Miller, Darrell	RPI	853-6861			
			Mitchell, Chuck	NRO	730-6215	877-667-2041		730-6121
			Mosteller, Ted	NASA	861-9307			
			Navarro, Rick	Delta IV Ops Manager	730-5562			730-5560
			Norman, Candice	RPI	861-0178			

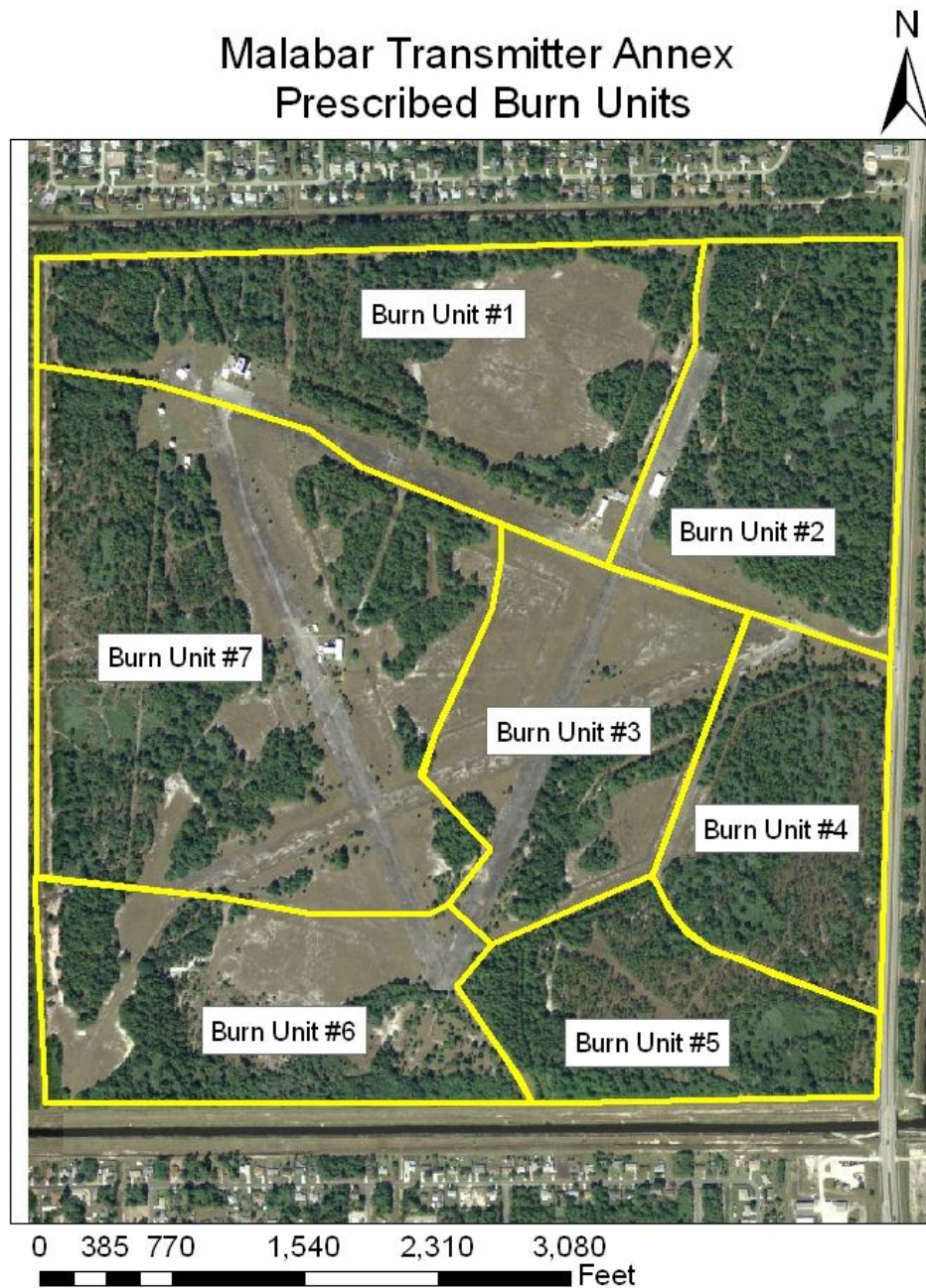
CONTROLLED BURN NOTIFICATION CHECKLIST					SGS Duty Office			
DEL	READ	Notification Only	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			O'Connor, Charlie	Sverdrup-CAPPS Facilities	867-0037	232-1269		867-4273
			O'Malley, James	NASA-UB-Facilities	867-6038	232-5419		867-7282
			O'Quinn, Mabel	45 CES/CEIE-C	853-6516	232-2241	863-9741	
			Paxton, Mark	USA	861-7699			
			Pelkey, Jeff	SCLS	853-8100			
			Peterson, William J (Bill)	Boeing DIV Pad Ops	730-5843		749-8788	
			Phillips, Daniel	ESC CCAFS	853-6567			
			Phillips, Steven	NRO	730-6264			
			Philo, Mike	FPL	726-4966	W321 266-1146 H321 298-6387		726-4944
			Plaza, Harry	NASA Environmental	867-8414			867-8040
			Pollan, William A	45 SW/SE/SRS	494-3266			
			Rose, Chris	Boeing Payload Ops MGR	867-3290	232-1996		867-0755
			Roth, Barbrette	Dynamac	853-3281			
			Sandefur, Terry	GS-11 AFTAC/XPC	494-2352			
			Schardt, Jeffery	USFWS	861-2812		863-8408	
			Schaub, Ronald	Dynamac	867-2112			867-2502
			Schmalzer, Paul	Dynamac	476-4112			853-2939
			Segall, Victor	Delta II Boeing Mission Integration	476-3028			
			Sestile, Mitchell E	Boeing	867-5425			

CONTROLLED BURN NOTIFICATION CHECKLIST					SGS Duty Office			
DEL	READ	Notification Only	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			SGS Duty Office	SGS Duty Office	853-5211			853-6828
			Signore, Tony	Delta IV EELV	730-5667		749-8789	
			Sly, Rusty D.	Northrup, Contamination Control	853-0282	310-389-7276	661-313-1770	
			Soto Cora, Heriberto	NASA-M&P	867-0762			867-6111
			Speece, Bob	NASA Mechanical Systems Engineering Contamination	861-3637	232-5298		867-2167
			Stokes, Alexander	45 CES/CEIE	494-7288			494-5965
			Stone, Frank	NASA Chief Launch Site Integration Branch	867-5582		266-4940	867-7297
			Stratton, Glenn	US Fish & Wildlife	861-6695		403-7638	861-0510
			Strickland, Scott	LMCO / NRO	730-6283	868-9307		
			Sutherland, Robin L.	45 CES/CEIE	494-2905			
			Taff, Albert E	NASA Operations Officer to SLF	867-2100			861-0331
			Thompson, James	SGS Customer Service	853-5797		749-4922	476-4091
			Van Vonderen, Robert	45 CES/CEL	853-0914			
			Vasile, Maria M Capt	AFTAC/TMB	494-7852 853-6027			
			Vincent, George B	Boeing SSPF Payload Ops Desk	867-5800	232-1225		867-0755

CONTROLLED BURN NOTIFICATION CHECKLIST

SGS Duty Office

DEL	READ	Notification Only	NAME	COMPANY	PHONE	BEEPER	CELL	FAX
			Vitt, Herb	ULA Atlas V	476-5165		759-8602	
			Wade, Randall I	NASA	861-0803			867-3658
			Walker, Robert H	NASA Launch & Landing	861-9326			
			Wendling, Paul	SCLS	853-8100			
			Whitehead, Kelly	LMCO Titan	853-9580			
			Williams, Harold G	NASA Environmental	867-8411			867-8040
			Williams, Thomas C	45 CEV/CEVP	494-9269			
			Wimberly, Gerald	SGS Fire Chief	476-5300			476-5521
			Woodings, Matthew H	SRS Safety	853-6825			
			Wyres, Anthony	KBR				
			Young, David	FPL				
			Zeno, Danny	NASA	861-8240			

J.12: MTA Prescribed Burn Compartments (Florida Forestry Service)

Attachment J-1: Distribution List

45 SW/CV/SE/JA/XP/MU/PA/CP
45 OG
45 LCG
45 MSG
45 MDG
Det 1, 45 MSG
1 SLS Delta II
5 SLS EELV
45 CES/CEL/CEF
45 LCSS
45 OSS
45 SFS
45 SVS
766 EOD
AFELM/LCO
AFTAC
CMT (Rail siding)
Det 1, 2d SOPS
LOSC
NASA Duty Desk
NASA LSP VA-2
NASA Safety
RPI
Shuttle Landing Facility
SLRSC
SPP00
USFWS/MINWR
ULA
WR-ALC/AFTLH