WILDLAND FIRE MANAGEMENT PLAN

ASSATEAGUE ISLAND NATIONAL SEASHORE



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EXECUTIVE SUMMARY

Fire management policies of the National Park Service (NPS) support Assateague Island National Seashore resource management goals. Primary among these are the protection of the seashore's natural and cultural resources, while at the same time providing for the safety of firefighters and the visiting pubic.

This Fire Management Plan contains the following program direction:

- **Guide the decision-making process where safety, social, political, and resource values are evaluated, and appropriate management response strategies are identified for wildland fires.**

- **Provide a framework for fuels management strategies through the use of both prescribed fire and non-fire treatments.**

- **Provide a platform from which to cooperate more fully in planning and implementing a wildland fire program across agency boundaries.**

Program operations included in this Fire Management Plan are preparedness, prevention, suppression, and fuels management. Applicable resource goals and objectives are derived from approved agency resource and general management plans.

The plan is organized to combine the latest scientific knowledge, including regional and local studies, with a hierarchy of policy direction from Departmental and Agency to the Federal Wildland and Prescribed Fire Management Policy (1995 & 2001), to accomplish resource and fire management goals and objectives. The intent of the plan is primarily operational in nature.

Compliance requirements with National Environmental Policy Act (NEPA) guidelines have been satisfied through development of an Environmental Assessment (EA). These requirements ensure a prudent assessment and balance between a federal action and any potential effects of that action, leading to consensus between fire managers, agency resource specialists, and the public. Any constraints or limitations imposed on the fire management program are also included as a part of the environmental assessment.

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I. INTRODUCTION

Assateague Island National Seashore is located off the Delmarva Peninsula area of Maryland and Virginia in the counties of Worcester and Accomack. It is 82 miles northeast of Norfolk and within an easy driving distance of Baltimore, Philadelphia, and Washington, D.C. Stretching approximately 37 miles from north to south, and from approximately 1 ¼ to 3 miles wide, the island is bordered on the east by the Atlantic ocean, sand beaches and high sand dunes that fall off into areas where ponds and marshes predominate on the leeward side of the island.

Figure 1

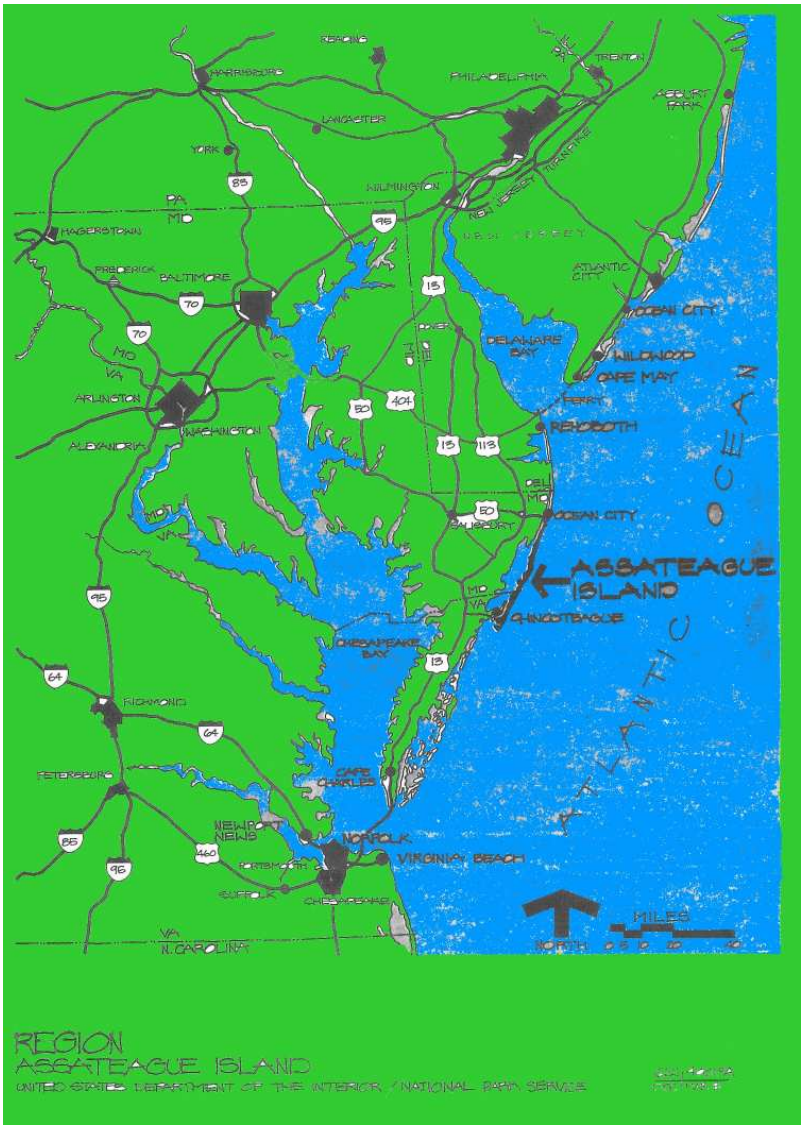


Figure 2



A. Reasons for Developing a Fire Management Plan

The National Park Service's Director's Order 18, November 2002 requires that all National Park Service areas with vegetation capable of sustaining wildland fire develop a Fire Management Plan (FMP). Approximately forty-eight percent of the 17, 290 acres found within the boundaries of Assateague Island National Seashore are capable of sustaining wildland fire. Lands that can sustain wildland fire are composed of pine and hardwood deciduous forests, marshes, grasslands, shrubland and, under the right conditions, some wetlands. It is expected that a variety of management activities, including prescribed fire and non-fire hazardous fuel reduction techniques, may be utilized in order to protect seashore natural and cultural resources and help return some seashore ecosystems to their representative historic range of variability.

B. Collaborative Process in Development of a Fire Management Plan

The General Management Plan (1982), Resource Management Plan (1999) and the Seashore's Strategic Plan (2005-2008), in addition to a variety of other plans, studies, and documents relating to seashore management, have all been developed with input from neighboring communities and cooperating agencies, as well as from other National Park Service program management areas.

Overall management of Assateague Island is shared (Figure 3) between the National Park Service (Assateague Island National Seashore), the U.S. Fish and Wildlife Service (Chincoteague National Wildlife Refuge) and the Maryland Department of Natural Resources (Assateague State Park). Written Agreements have been developed and implemented, providing a framework for cooperative management of the island, including a wide range of fire management activities.

Figure 3



C. Implementation of Federal Fire Management Policy

This Fire Management Plan (FMP) will implement fire management policies and help achieve fire management goals defined in: (1) Federal Wildland Fire Management Policy and Program Review; (2) Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDOI/USDA); and (3) A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10 Year Comprehensive Strategy Implementation Plan.

D. Compliance

In compliance with the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI) have been prepared for this Fire Management Plan, and placed in Appendix A.

A number of structures found within Assateague Island National Seashore are listed on the National Park Service List of Classified Structures. In addition, some of these structures are listed on or are eligible for inclusion on the National Register of Historic Places. All proposed prescribed fire plans will be reviewed for compliance with Section 106 of the National Historic Preservation Act.

E. Authorities for Implementation of Fire Management Plan

The authority for fire management is found in the National Park Service Organic Act (Act of August 25, 1916), which states the Agency's purpose:

"... is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

This authority was further clarified in the National Parks and Recreation Act of 1978:

"Congress declares that...these areas, though distinct in character, are united...into one National Park system.... The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

Authorities to enter into agreements with other Federal bureaus and agencies; with state, county, and municipal governments; and with private communities, corporations, groups and individuals are cited in NPS-20 (Federal Assistance and Interagency Agreements).

The authority for rendering emergency fire or rescue assistance outside of the National Park System is the Act of August 8, 1953 (16USC 1b(1)), and the Department Manual (910 DM).

Related statutory authorities are: the Weeks Act, Clean Air Act, Clean Water Act, Endangered Species Act, National Environmental Policy Act, Antiquities Act, Maryland and Virginia State Law, and others.

II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

A. NPS Management Policies as Related to Fire Management

It is the policy of the National Park Service to allow natural processes to occur to the extent practical while meeting specific seashore unit management objectives. NPS Management Policies (1988) state "Fire is a powerful phenomenon with the potential to drastically alter the vegetative cover of any park. Fire may contribute to or hinder the achievement of park objectives. Park fire management programs will be designed around resource management objectives and the various management zones of the park". Specific guidance on wildland fire is contained in the National Park Service Directors Orders (DO-18), Reference Manual (RM-18), and “The Wildland and Prescribed Fire Management Policy Implementation and Reference Guide” (1998).

B. Enabling Legislation and Purpose

As early as 1935, Assateague Island was identified by a federal study as one of twelve areas along the Atlantic Coast suitable and worthy of preservation as a National Park. In 1940, Maryland state planners recommended land acquisition on Assateague Island in order to develop a state park (eventually, a master plan for the state park was developed and land acquisition was undertaken in 1964). The Chincoteague National Wildlife Refuge was established in 1943 and was the first major step in the federal effort regarding protection of the island. The refuge includes almost the entire island in Virginia and as well as approximately 400 acres in Maryland.

In the 1950’s the Ocean Beach Corporation sold hundreds of residential lots, and design plans called for commercial development and the construction of a causeway from the mainland. As the result of these developments and prospects for future degradation, federal efforts to protect the remainder of the island began in earnest in the late 1960’s. These efforts were underscored by the effects of a serious storm that struck the island in March of 1962, resulting in widespread damage to private property (30 homes were destroyed and the remaining 18 were damaged); casting considerable doubt as to the feasibility of the continuation of private development on the island. The establishment of Assateague Island National Seashore became a reality on September 21, 1965 (PL 89-195). The enabling act also provided that the lands and waters of the Chincoteague National Wildlife Refuge, located on the southern end of Assateague Island, be administered under the auspices of the United States Fish and Wildlife Service. As a result of the cooperative efforts of three agencies; the National Park Service, U.S. Fish and Wildlife Service, and the Maryland Department of Natural Resources, Assateague Island is being held in protective trust; a priceless heritage of wildlands, wildlife, and outdoor recreation.

As was discussed in the previous paragraph, Assateague Island National Seashore was authorized by Congress as a unit of the National Park System in the Act of September 21, 1965 (Public Law 89-195). General statements of purpose for the Seashore were included in Sections 1 and 6 of the Act, which state the creation of the National Seashore as being:

"...for the purpose of protecting and developing Assateague Island in the States of Maryland and Virginia and certain adjacent waters and small marsh islands for public outdoor recreation and enjoyment, the Assateague Island National Seashore shall be established and administered in accordance with the provisions of this Act."

“..for the conservation and management of natural resources..”

This purpose was amended by the Act of October 21, 1976 (Public Law 94-578) which directed the Secretary of the Interior to prepare a "comprehensive plan" which would include, among other things, "measures for the full protection and management of natural resources and natural ecosystems of the seashore;" The General Management Plan which evolved from this mandate reflects a systematic approach to seashore management whereby recreational use and development is balanced with the need to ensure long term preservation of natural resources, processes and values.

C. General Management Plan and Fire Management Objectives

The following management objectives, as stated in the most current General Management Plan (1982) for Assateague Island National Seashore, constitute the interpretation of the seashore’s authorizing legislation. They state, in part, that the purpose of Assateague Island National Seashore is to:

- *Maintain long term protection and preservation for all resources found within seashore boundaries.*
- *Protect, enhance, and interpret natural resources in a manner consistent with applicable policies and regulations while supporting cultural resource objectives.*

In addition, the seashores Strategic Plan (2001 - 2005) lists as two of its long term goals the need to ensure that:

- *Seashore resources are preserved*

As well as the necessity to:

- *Strengthen and preserve natural and cultural resources and enhance recreational opportunities managed by partners*

D. Resources Management Plan/Fire Management Objectives

This Fire Management Plan will be a component of and an appendix to the Resources Management Plan (1999). Its primary purpose is to integrate fire management objectives with

other resource management programs. The objectives of the Resources Management Plan relating to fire provide for the preservation, restoration, maintenance, and protection of the cultural and natural resources of the seashore. Activities described in this plan are part of the effort of restoring natural ecosystem processes to the maximum extent practicable. These objectives are specifically:

1. Facilitate implementation of those actions and activities involving natural and cultural resources in a manner which complies with the spirit and intent of the enabling and regulatory legislation, and the provisions of the General Management Plan (Resource Management Plan 1999).

2. Protect and preserve indigenous natural resources, and natural ecosystem conditions and processes (Resource Management Plan 1999).

3. Protection and management of rare, threatened and endangered species (Resource Management Plan 1999 and Critical Resource Management Issues).

4. Management of exotic plants and animals and impacts to island habitats from non-native species (General Management Plan 1982 and Resource Management Plan 1999)

5. Identify, evaluate, and protect the seashore's cultural resources (Resource Management Plan 1999).

E. Fire Management and Accomplishment of Seashore Objectives

Through the implementation of this Fire Management Plan (FMP), the seashore will be able to utilize fire as a tool for vegetation management. The FMP, especially the prescribed and non-fire components, provides a detailed action program that is consistent with NPS Management Policy and DO-18 (Wildland Fire Management) and will assist the seashore in its efforts to preserve, restore, maintain, and protect the cultural landscape, and manage hazard fuel conditions. Actions implemented through this FMP will meet the following stated objectives:

1. Allow the seashore to suppress unwanted ignitions in a manner that is both effective from a suppression standpoint and that allows for maximum protection of cultural and natural resources. Emphasis will be placed on cooperative activities with other agencies with whom the seashore operates.

2. Determine areas that will benefit from a program of hazardous fuel reduction through both non-fire and prescribed fire methodologies.

3. Identify methods and techniques where prescribed fire can be utilized to assist in creating or enhancing cultural landscapes.

4. Implement a prescribed fire program for managing ecosystems that will maintain viable and diverse plant and animal populations, reduce invasive species, and assist in the restoration of seashore ecosystems to more closely replicate their historic ranges of variability.

5. Ascertain the role and relative importance of wildland fire in shaping ecosystem processes on Assateague Island.

III WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations

Wildland fire at the seashore will be managed to enhance community protection, diminish risk and consequences of severe wildland fires, and, to the extent possible, increase health of seashore ecosystems. To these ends the seashore will employ the following goals:

1. Improve wildland fire prevention and suppression activities

2. Identify and reduce hazardous fuels

3. Promote community assistance

4. Conduct appropriate research

A community-based approach to wildland fire issues will be utilized in order to facilitate close collaboration and cooperation with neighboring agencies that have a vested interest in areas related to wildland fire management at the seashore.

B. Wildland Fire Management Goals

These goals are programmatic in direction and are intended to provide safe and effective implementation of the fire management plan.

Goal 1: Make firefighter and public safety the highest priority of every fire management activity.

Goal 2: Suppress all unwanted and undesirable wildland fires, regardless of ignition source, to protect the public, private property, and natural and cultural resources of the seashore.

Goal 3: Manage wildland fires in concert with federal, state, and local air quality regulations.

Goal 4: Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities.

Goal 5: Reduce wildland fire hazard around developed areas and areas adjacent to cultural, archeological and historic sites.

Goal 6: Use prescribed fire, where appropriate, as a method of restoring and maintaining cultural landscapes and as a means to meet natural resource objectives of the seashore.

C. Wildland Fire Options

The following is a discussion of available wildland fire options and their use at the seashore:

1. Wildland Fire Suppression: All unscheduled wildland fires at the seashore will be suppressed using the most appropriate management response. Determination of the most appropriate management response will consider human safety, threats to and potential damage to property, resources, and cost effectiveness. Suppression will *not* be used to accomplish resource objectives.

2. Prescribed Fire: May be used for protection of cultural resources, cultural scene restoration and maintenance, hazard fuel reduction, and natural resource objectives.

3. Wildland Fire Use: This option was rejected due to the small size of the seashore and the lack of available qualified personnel required to manage and implement these types of fires.

4. Non-Fire Applications: The reduction or removal of fuels by mechanical or chemical methods are both options that may be used for objectives such as protection of resources, private property, cultural landscape restoration and maintenance, invasive species control, or meeting other natural resource objectives.

Prescribed fire and/ or non-fire and chemical treatments may be used either sequentially or in conjunction with one other.

D. Description of Wildland Fire Management Strategies by Fire Management Unit

Assateague Island National Seashore is located within the states of Maryland and Virginia. Although fuels, weather and topography are relatively homogenous on all of the lands that comprise the seashore, certain management considerations make it preferable to allocate fire management responsibilities into two, separate and distinct, Fire Management Units (FMU). In order to clarify seashore resources in a management

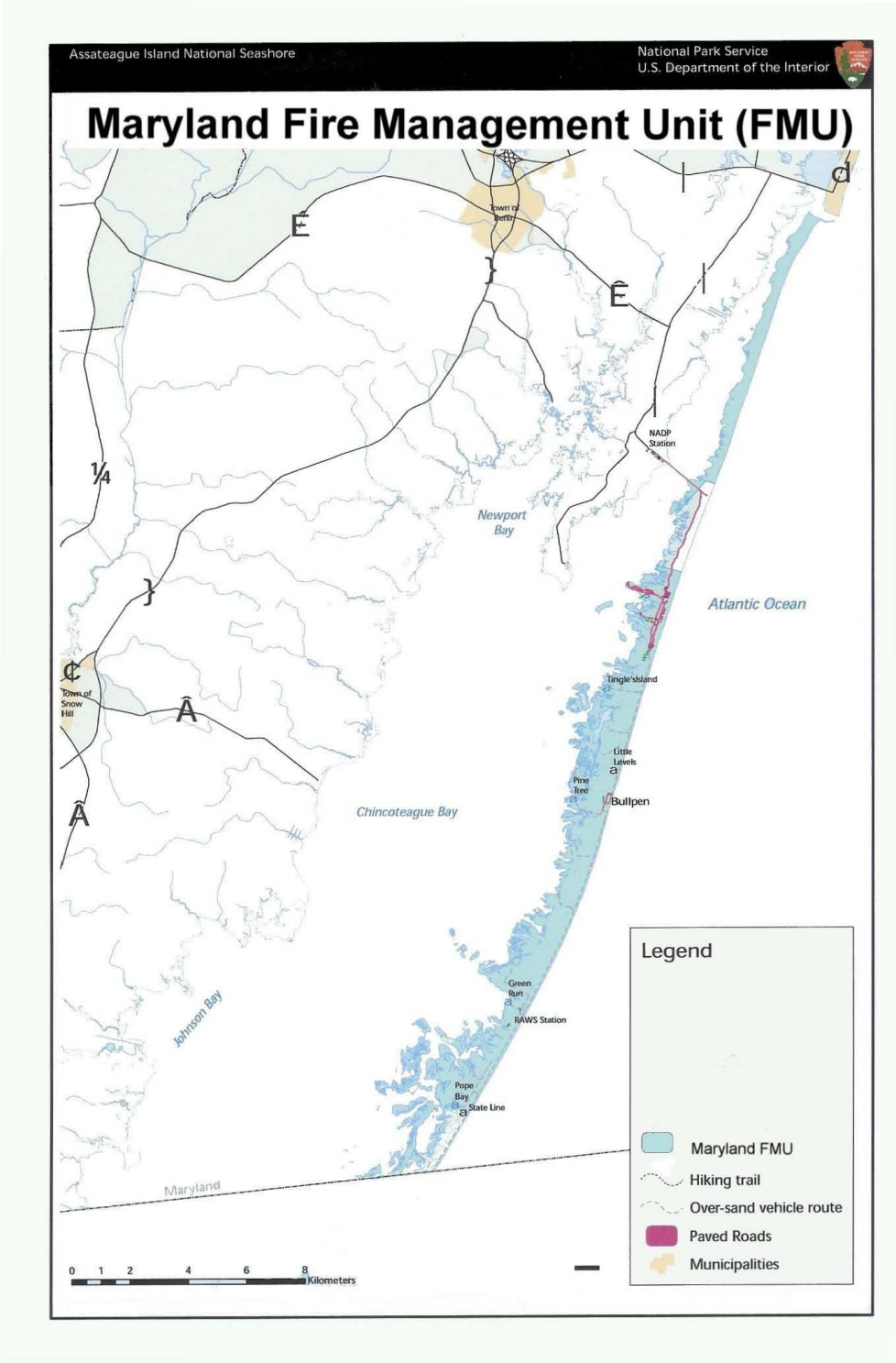
context, a brief description of each of the management units follows***. Unless otherwise indicated, descriptions are applicable to both Fire Management Units.***

1. Maryland Fire Management Unit.

The Maryland FMU is identified on four different United States Geological Survey Quadrangle maps:

- Ocean City Quadrangle UTM 18 491655E 4241853N (WGS 84/ NAD 83)
- Tingles Island Quadrangle UTM 18 486600E 4228620N (WGS 84/ NAD 83)
- Berlin Quadrangle UTM 18 488836E 4233872N (WGS 84/ NAD 83)
- Whittington Point Quadrangle UTM 18 482192E 4216019N (WGS 84/ NAD 83)

Figure 4

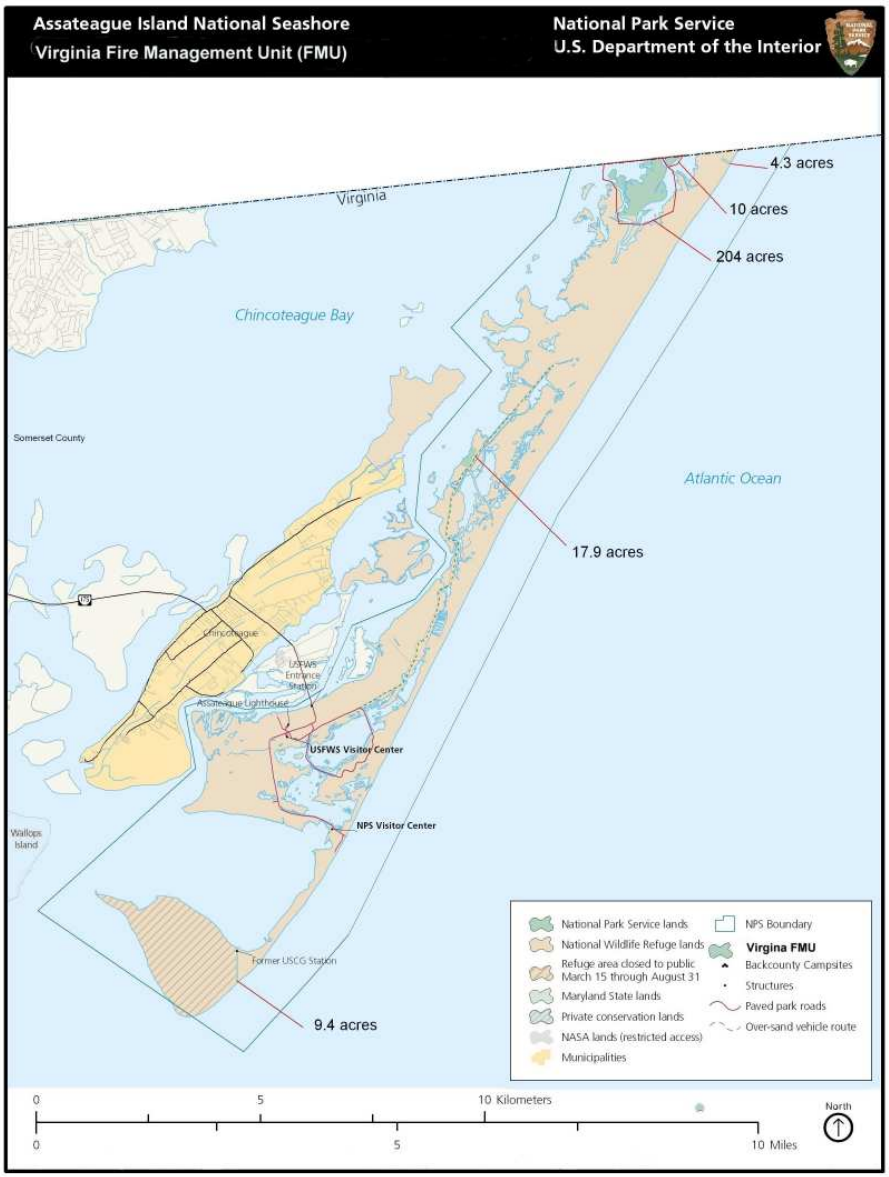

Assateague Island National Seashore
National Park Service
U.S. Department of the Interior
Maryland Fire Management Unit (FMU)
Town of Berlin
NADP Station
Newport Bay
Atlantic Ocean
Tingle Island
Little Levels
Pine Tree
Bullpen
Chincoteague Bay
Town of Snow Hill
Green Run
RAWS Station
Pope Bay
State Line
Johnson Bay
Maryland
0 1 2 4 6 8 Kilometers
Legend
Maryland FMU
Hiking trail
Over-sand vehicle route
Paved Roads
Municipalities

2. Virginia Fire Management Unit

The Virginia FMU is identified on three different United States Geological Survey Quadrangle maps:

- Chincoteague East UTM 18 467804E 4194378N (WGS 84/ NAD 83)
- Wallops Island UTM 18 466280E 4191482N (WGS 84/ NAD 83)
- Whittington Point Quadrangle UTM 18 482192E 4216019N (WGS 84/ NAD 83)

Figure 5



a. Physical and Biotic Characteristics

- **Topography:** The topography of Assateague Island, like other middle Atlantic barrier islands, is characterized by dynamic change. Landforms on the island, typically narrow and linear with cross-island zonation of plant communities, rise from the sea to merge either into wandering embryonic or grass – bound dunes. In many areas, these dunes may exhibit a further transition from beach grass to myrtle brush to loblolly pine forest on the higher ground, or they may fall gently unto low- lying potholes and salt meadows in the interior of the island. Land elevations range from sea – level to approximately 47 feet above sea level. The bay side of the island on the west is mostly timbered with loblolly pine and is bordered by salt marsh and salt meadows.

  Barrier islands move, or rollover, towards the mainland via sand transport- from the ocean-side of the island to the bay-side. Through this process, the physical location of the island migrates, but the cross-island vegetative community features are sustained relative to one another. The mechanisms for sand transport from the ocean-side to the bay-side of the island are: wind transported sand; water transported sand; water transported sand through overwash; and water transported sand through temporary inlet formation and closure. On Assateague Island, wind transported sand accounts for approximately 10% of sediment input to the bay-side, whereas water transported sand is responsible for about 90%.

- **Soils:**

  Soils at Assateague Island National Seashore are best characterized as consisting primarily of sand on the uplands, with silt loams and peat soils predominating on tidal marshes and in other wetlands. Eight different soil types can be found within seashore boundaries. Combinations of all of these soils can be found intermingled throughout the island. Descriptions of each soil type are as follows:

  AcB--Acquango Sand, 2 To 5 Percent Slopes

  The Acquango component makes up 90 percent of the map unit. The assigned Kw erodibility factor is .10. This soil is excessively drained. The slowest permeability within 60 inches is rapid. Available water capacity is moderate and shrink swell potential is low. This soil is occasionally flooded and is not ponded. The water table is deeper than 6 feet. The soil has a slightly saline horizon. It is in non-irrigated land capability class 7s. This component is not a hydric soil.

  AcC--Acquango Sand, 5 To 10 Percent Slopes

  The Acquango component makes up 90 percent of the map unit. The assigned Kw erodibility factor is .10. This soil is excessively drained. The slowest

permeability within 60 inches is rapid. Available water capacity is moderate and shrink swell potential is low. This soil is occasionally flooded and is not ponded. The water table is deeper than 6 feet. The soil has a slightly saline horizon. It is in non-irrigated land capability class 7s. This component is not a hydric soil.

Only occasionally are either of the Acquango types discussed in the previous sections subjected to flooding. These gently sloping to steep soil types are very deep and are primarily found on the islands sand dunes. They are both well-drained and comprise soil types utilized for wildlife habitat and recreation. Of the soil types found on the island, the Acquango Sand (AcC) has a slight to moderate potential for erosion, whereas all of the other types possess a potential listed as slight.

As--Askecksy Loamy Sand

The Askecksy component makes up 80 percent of the map unit. The assigned Kw erodibility factor is .10. This soil is poorly drained. The slowest permeability within 60 inches is rapid. Available water capacity is moderate and shrink swell potential is low. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 6 inches. There are no saline horizons. It is in non-irrigated land capability class 4w. This component is a hydric soil. This soil has a relatively high productivity potential for tree and shrub species, particularly loblolly pine. Potential is limited primarily by the presence or absence of salt spray generated by ocean waves, allowing primarily salt tolerant species to thrive. The survival potential of some seedlings is limited by moisture stress.

Be--Beaches

The Beaches component makes up 100 percent of the map unit. The assigned Kw erodibility factor is .05. This soil is poorly drained. The slowest permeability within 60 inches is rapid. Available water capacity is moderate and shrink swell potential is low. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 36 inches. The soil has a strongly saline horizon. It is in non-irrigated land capability class 8w. This component is a hydric soil. This nearly level to moderately sloping unit is used primarily for recreation and wildlife habitat. Most other uses are limited by flooding with salt water, severe erosion, and accretion of sediments.

BkA--Brockatonorton Sand, 0 To 2 Percent Slopes

The Brockatonorton component makes up 80 percent of the map unit. The assigned Kw erodibility factor is .10. This soil is moderately well drained. The slowest permeability within 60 inches is rapid. Available water capacity is very high and shrink swell potential is low. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 30 inches. The soil has a

slightly saline horizon. It is in non-irrigated land capability class 6s. This component is not a hydric soil**.**

BkB--Brockatonorton Sand, 2 To 5 Percent Slopes

The Brockatonorton component makes up 80 percent of the map unit. The assigned Kw erodibility factor is .10. This soil is moderately well drained. The slowest permeability within 60 inches is rapid. Available water capacity is very high and shrink swell potential is low. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 30 inches. The soil has a slightly saline horizon. It is in non-irrigated land capability class 6s. This component is not a hydric soil.

These soil types found primarily on back dunes and associated with nearly level barrier flats between dunes and along marsh edges, are relatively productive and often support quantities of herbaceous plants and grasses. Varieties of pines and hardwood species can be found in relative frequency, though in areas where salt water flooding is more frequent, vegetation is characterized by the presence of the wax-myrtle shrub community. This soil type possesses a slight erosion potential.

BX--Boxiron and Broadkill Soils

The Boxiron component makes up 40 percent of the map unit. The assigned Kw erodibility factor is .02. This soil is very poorly drained. The slowest permeability within 60 inches is moderately slow. Available water capacity is very high and shrink swell potential is moderate. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 0 inches. The soil has a moderately saline horizon. It is in non-irrigated land capability class 8w. This component is a hydric soil.

Pu--Purnell Peat

The Purnell component makes up 80 percent of the map unit. The assigned Kw erodibility factor is .02. This soil is very poorly drained. The slowest permeability within 60 inches is rapid. Available water capacity is very high and shrink swell potential is low. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 0 inches. The soil has a moderately saline horizon. It is in non-irrigated land capability class 8w. This component is a hydric soil.

Both of these soil types (BX and PU) are found primarily in or near marshes and support those plant species that can tolerate frequent flooding from salt water. Primarily for this reason, soil productivity is limited to salt-tolerant species types such as native marsh grasses (i.e. Spartina spp.).

- **Climate**

  Assateague Island National Seashore is classified within the humid-subtropics weather zone, typified by warm, humid summers and mild winters. Seasonal temperature ranges are largely influenced by the moderating effects of the Delmarva Peninsula's proximity to the Chesapeake Bay and the Atlantic Ocean. The island lies in the zone dominated by the prevailing westerly, where most weather systems track from the west to the east. The low topographic relief found on the seashore, combined with exposure to the Atlantic Ocean, makes it extremely susceptible to the effects of storm activity. The hurricane season runs from June through November. Summer-season hurricanes generally originate over the Atlantic Ocean in the vicinity of the Bahamas, Leeward, or Windward Islands. Storm centers usually remain offshore, bringing heavy rains, high winds, high tides, and rough seas to the island. Later in the season, hurricanes tend to originate in the Caribbean. These storms tend to lose a great deal of their force as they travel across the southeastern states, though they still carry the potential for devastating impacts upon the island and its environs.

  Summer days are typically hot and humid. Occasional thunderstorms strike, often with little forewarning, presenting the danger of lightning strikes and attendant exposure to seashore visitors, particularly those utilizing beach areas for recreational purposes. Although autumn days are typically cool and clear, the season also marks the onset of northeasters. These low pressure systems typically move along the coast, generating storm activity caused by the counterclockwise cycling of moist air. Northeasters are characterized by heavy, persistent rain, strong northeast winds, higher than average tides, and rough seas. These conditions may persist for two to five days. Northeasters are most intense in the winter, and carry the greatest potential for overwash of the primary dunes along the ocean side of Assateague Island. Winter temperatures tend to be rather mild by comparison to their inland counterparts. Although snow is not uncommon, significant accumulations rarely occur. Total annual precipitation varies from between 30 and 60 inches; averaging 38 inches per year.

- **Hydrology:**

  Assateague Island is a classic Atlantic coastal barrier island, consisting of a variety of wetland resources, including open ocean waters, marsh (both salt and freshwater), and relatively small seasonal ponds or vernal pools. According to the United States Fish and Wildlife Service (USFWS), Wetlands Inventory Map (1977), of the approximately 39, 722 acres that comprise the seashore, 23, 722 acres (60%) are considered wetlands of one category or another (Estuarine, Palustrine, or Marine). Regardless of their specific type, all wetlands share the fact that they are delicate ecosystems that contain diverse populations of flora and fauna, many of which cannot be found elsewhere.

Estuarine wetlands are systems consisting of salt and brackish tidal waters and contiguous wetlands where ocean water intermittently dilutes the freshwater runoff from the surrounding land. The salinity of this type of system changes with tides throughout the day and the differences in salinity as well as tidal flooding have a substantial effect on the distribution of these wetland systems as well as the species that can survive and thrive in them. Estuarine systems contain a wider range of species diversity than any of the other wetland types. Estuarine wetlands are located along the western or bay side of Assateague Island.

Palustrine wetlands are freshwater wetlands that comprise a much smaller total percentage of wetland habitats on Assateague Island. These systems include wetlands that are found inland, and, as such, they lack flowing water and may contain some ocean-derived salinity. Palustrine systems on Assateague are associated with high water tables and intermittent or vernal ponds that result from rainfall and storms. The majority of these types of wetlands are found between the ocean and the bayside of the seashore. Though small in size and number, these areas serve as extremely important sources of freshwater for many species of flora and fauna.

Marine wetland systems occur from the extreme high water line on the island and extend out many miles to the edge of the continental shelf. The entire Atlantic coastline of Assateague Island is representative of this type of system.

- **Threatened and Endangered Species:**

Information about plant and animal species that have been listed as federally threatened, endangered, or that are state listed species, and that live either on in close proximity to Assateague Island National Seashore have been provided by the Natural Resource Management Staff of Assateague Island, as well as a number of other agencies, including the Maryland Department of Natural Resources, The Nature Conservancy, and the U.S. Fish and Wildlife Service. As a point of reference, it should be noted that information reference to species located on the Virginia end of the island, are omitted since those lands, with exception of a very small parcel, are managed by the U.S. Fish and Wildlife Service under an interagency agreement with the Assateague Island National Seashore and the National Park Service.

The Assateague Island National Seashore document *Critical Issues*, has identified a series of resource management concerns that are earmarked to receive priority management action. One of these identified issues is the need to protect and manage rare, threatened, and endangered species. Portions of the seashore provide suitable habitat for a variety of state and federally listed species (Appendix V), both flora and fauna. The known and perceived threats to these species vary in intensity, and include a range of causative factors that include recreational activities, disruptions to natural coastal ecosystem processes, and

interactions with both native and non-native and invasive species. Several of the high-profile species, such as the piping plover (*Charadrius melodus)* and sea beach amaranth (*Amaranthus pumilus)* are being actively managed, but others remain poorly understood and are largely unmanaged at this point in time. In addition, a number of rare resident plant, insect, and transient bird species are in need of having additional studies conducted with regard to threat mitigation, routine evaluation of condition, and completion of appropriate levels of documentation.

National Park Service policy (NPS 2001) requires that protection be provided to state-listed flora and fauna that are designated as species of concern. The protective measures afforded the so-designated species are similar to the protection afforded to federally listed threatened and endangered species.

A total of 30 plant species found on Assateague Island National Seashore are considered to be species of concern on either federal or state lists. In most cases, little is known about the plant population dynamics of these species and their interactions with other flora and fauna. For this reason, Assateague Island National Seashore has established as one of its management priorities the identification, protection, and monitoring of these species of concern.

The federally listed species, the sea beach amaranth (*Amaranthus pumilus*), is an annual herb that was once found along the Atlantic coast from Massachusetts to South Carolina. This plant has been eliminated from three states in its historical range and is found today only is scattered locations in seven states, including its only known location in Maryland on Assateague Island. In 1993, the sea beach amaranth was listed as federally threatened under the auspices of the Endangered Species Act. Sea beach amaranth is a low-growing plant that flowers from mid-summer to late fall and produces seeds from July or August until the plant dies. As the growing season progresses, the plant acts as a sand binder and forms a mound of sand around its base. As the sand mound grows, leaves from the plant that have been produced at an earlier time in the plants growing cycle are buried by the enlarging mound, with the plant often growing to three feet in diameter. The species' primary habitat is on barrier beaches, on over-wash fans at the end of islands where new material may be deposited, and on the lower fore dunes of non-eroding beaches. Its growth is concentrated in the wrack line of material deposited by the highest spring tides. Sea beach amaranth is seldom found in well-vegetated areas. It appears to require extensive areas of barrier beaches where seeds can be dispersed across the landscape and germinate in suitable habitat as it becomes available. Threats to the population of this species include beach recreation, grazing by exotic sika deer, feral horses, and native white-tailed deer.

Seaside knotweed (*Polygonum glaucum*) is found on bare and sparsely vegetated sections of the beach, or in swale or overwash zones. Its low-lying stems hold sand and assist in building beach and dune areas.

Sea-beach sedge (*Carex silicea*) can be found on both sandy beach and dune areas and in salt marshes. It is typically found in higher elevation areas near the high tide line, and occasionally in back dune areas.

Coastal bedstraw (*Galium hispidulum*) grows in a variety of habitats. It is a small herbaceous plant that lives in the understory of maritime deciduous forest, pinelands, old fields, and other open areas.

Assateague Island is home to four federally endangered mammalian species, including the Delmarva fox squirrel (*Sciurus niger cinerus*). This species was transplanted to the island between 1969 and 1971 and is now found throughout select forested areas on the southern end (Virginia) of the island at the Chincoteague National Wildlife Refuge. The current population is thought to be stable. There are no current records of Delmarva fox squirrel having been found on lands administered by Assateague Island National Seashore, but it could occur there.

The other three federally protected mammalian species on Assateague Island are all marine mammals, the finbacked whale (*Balaenoptera physalus*), humpback whale (*Megaptera navaeangliae*), and the sperm whale (*Physeter catodon*). Since the wildland fire management program is highly unlikely to have any influence upon these marine species, they will not be discussed further in this assessment.

Located along the Atlantic migratory flyway, Assateague Island is renowned for its abundant and diverse bird habitat. More then 300 bird species make their year-round homes on the island or visit it during their twice-yearly transcontinental migration. Because its mid-latitude location is within the migratory routes of both northern and southern species, the island provides a unique environmental niche where a wide variety of birds may gather. A total of fourteen federally and state listed species of concern are found on Assateague Island, including the federally threatened piping plover (*Charadrius melodus*) and bald eagle (*Haliaeetus leucocephalus*). The yellow-billed cuckoo (*Coccyzus americanus*), a candidate for designation on the federal list, also is found at Assateague.

Piping plovers are small light-colored shorebirds that breed in a wide range of geographical areas; from the northern plains, along the Great Lakes, and along the Atlantic Coast from Newfoundland to South Carolina (Dyer et al. 1988). The Atlantic Coast population, as represented by the species on Assateague Island, is listed as threatened (USFWS 1985). On Assateague Island, adults forage on the ocean and bay beaches, in overwash areas, in swales with sparse vegetation, and in seasonal freshwater pool and pond habitats. Their nests are formed from shallow depressions in the sand, mixed with pebbles or shells in areas with little or no vegetation. Typically, nests are located on sandy beaches

and sand spits located above the high tide line, on gently sloping dunes, in blowout areas behind dunes, in wash over between dunes, and on sandy dredge material (Dyer et al. 1988). The fledging period for the piping plover represents a critical time period as the chicks depend on walking access to areas where invertebrates are found in abundance (i.e. marine worms and fly larvae). These typically are present on sand flats, mudflats, wrack lines, and on upper beaches and dunes.

Assateague Island National Seashore and the Chincoteague National Wildlife refuge both enact public closures of selected nesting areas during breeding and fledging season (March – August) as a means to provide habitat for nesting and breeding.

Other avian species of concern found on the state list, include the black skimmer (*Rynchops niger*), least tern (*Sterna antillarum*), royal tern (*Sterna maxima*), gull-billed tern (*Sterna nilotica*), and the sandwich tern (*Sterna sandvicensus*). These species require many of the same types of specific habitat (uninhabited sand flats, dunes) as the piping plover; habitat that is disappearing in areas where public recreational use and development are increasing.

Another avian species worth mention is the federally endangered red-cockaded woodpecker (*Picoides borealis*), a species that has *not* been identified as living on Assateague Island, but that once was a resident of Worcester County, Maryland, and is thought to have been extirpated in that area. It is included in this assessment for a number of important reasons: First; because it is a federally protected species, and Assateague Island and environs may have been within the historical natural range of this species, second; Assateague Island may possess the rather unique habitat requirements necessary for this species to propagate and thrive(i.e. the presence of mature loblolly pine and mixed pine-hardwood deciduous forest), and third; although a recovery plan for this species has not yet been identified, the potential does exist for such an effort to be launched at an undetermined time in the future. Because habitat requirements are so narrowly defined for this species, the upland forest of Assateague Island may one day be recognized as potential habitat in the event that a recovery effort is launched. The inclusion of discussion of this species is only undertaken as a means of recognition for the potential habitat that exists on Assateague Island. *There are currently no plans to re-introduce it to the island.*

One reptile identified at Assateague Island, the Atlantic loggerhead turtle (*Caretta caretta*), is a federally threatened species. This species lives in the marine environment surrounding Assateague Island, and in the past has occasionally used island beaches for nesting activity. Three other federally listed sea turtles, the Atlantic green turtle (*Chelonia mydas*), Atlantic leatherback turtle (*Dermochelys coriacea*), and the Atlantic kemp's Ridley turtle

(*Lepidochelys kempii*), are also found in the marine waters off-shore of Assateague Island.

A number of other amphibians, reptiles, and insects found on Assateague Island, but not within seashore boundaries, are listed as state species of concern. For example, the barking tree frog (*Hyla gratiosa*), a state endangered species, has been identified as a resident of Assateague Island, as has the Eastern narrow-mouthed toad (*Gastrophryne carolinensis*), and the broad head skink (*Eumeces laticeps*). The red-bellied water snake (*Nerodia erythrogaster*), is a resident of island wetlands and upland forests.

Several insects, including the white tiger beetle (*Cicindela dorsalis media*), little white tiger beetle (*Cicindela lepida*), and the Palemedes swallowtail (*Papilio palamedes*), a butterfly, are all on the state list of species of concern and can be found on the island. The two species of tiger beetles found on the island appear to prefer nesting in areas along the beach, just above the high tide line. They make their burrows in the sand and search for prey on the beach and in the intertidal zone,

- **Wildlife**

Despite the often harsh conditions that occur in a coastal environment such as the one found at Assateague Island National Seashore, a wide variety of animal species have managed to carve out a niche on the island. Each of the island's varying ecological zones provides a unique habitat for a multitude of animals, including birds, mammals, reptiles, amphibians, and invertebrates.

Mammals

Mammalian species that live on Assateague Island occupy a wide array of habitats and range in size from small rodents to large marine mammals; the latter best represented by the bottlenose dolphin *(Tursiops truncatus)* and several species of whale that feed in the island's offshore waters. These species will *not* be considered in this discussion since their habitat would not be impacted in any manner from the implementation of a wildland fire management program.

Feral horses *(Equus caballus)* are perhaps the island's best known inhabitants, mammalian or otherwise. These horses roam freely over the Maryland portion of the island and within fenced-in areas of the Chincoteague National Wildlife Refuge located on the Virginia end of the island. The horses spend most of their time grazing, sleeping, or moving slowly in bands from one feeding area to another. They feed primarily on salt marsh cordgrass (*Spartina alterniflora*), but they will also eat beach grass (*Ammophila breviligulata*), greenbrier (*Smilax rotundifloria*), bayberry (*Myrica pensylvanica*), poison ivy (*Toxicodendron radicans*), and many other types of vegetation.

Rodents such as the meadow jumping mouse (*Zapus hudsonicus*) and meadow vole (*Microtus pennsylvanicus)* live in the grassy areas bordering salt and freshwater wetlands and feed on seeds, wetland plants, and, in the case of the jumping mouse, insects. Though rarely seen, river otters (*Lutra canadensis)* and muskrat (*Ondatra zibethica)* also make their homes in the island's marshy areas and adjacent to waterways.

Red fox (*Vulpes vulpes)* build their dens in sand dunes and roam the island hunting for mice, birds, insects, and berries. Opossum (*Didelphis marsupialis)* provide the important environmental service of waste removal, feeding primarily upon the island's carrion. The only marsupial found in North America, the opossum gives birth to premature young who then complete their development inside of the pouch found on the outside of the mother's body. Raccoons (*Procyon lotor)* scavenge the crustaceans, fish, and other organic material washed ashore by tidal action.

Two species of deer, the native white-tailed deer (*Odocoileus virginianus)* and the non-native sika deer (*Cervus Nippon),* inhabit the island's upland forests and shrub habitat. The sika deer is not really a deer at all, but a diminutive species of oriental elk, first introduced to Assateague in the 1920's. Ongoing research is evaluating the ecological impacts of sika deer on both native vegetation communities and on other wildlife such as the white-tailed deer.

The Delmarva fox squirrel *(Sciurus niger cinereus),* a federally endangered species, was transplanted to Assateague Island between 1969 and 1971. It now is found scattered throughout the upland forest regions on the southern end (Virginia) of the island on lands managed as a part of the Chincoteague National Wildlife Refuge. Populations of this species are thought to be stable or slightly declining owing to habitat loss suffered as the result of southern pine beetle infestations in prime habitat areas (1999). This species prefers to live and reproduce in mature mixed-pine/ hardwood forests similar to those found scattered throughout the island.

Birds

Many bird species (300+) either make their year-round homes on the island or visit it during their twice-yearly transcontinental migration. Located along the Atlantic migratory flyway, Assateague Island plays host to a wide variety of both migratory and resident bird species. Because its mid-latitude location is within the migratory routes of both northern and southern species, the island provides a unique environmental niche where a wide variety of birds may gather. The island's rich mosaic of upland forest, scrub/ shrub, dune and marsh habitats offers feeding and nesting opportunities for a tremendous array of shorebirds, songbirds, raptors, waterfowl and waders. Shorebirds by the tens of thousands depend upon the islands protected foraging and resting areas during their

migrations. Each fall, large flocks of waterfowl such as snow geese (*Chen caerulescens)* begin arriving at Assateague Island where they will spend the winter months traveling between the sheltered bays and salt marshes and the fallow farm fields on the mainland adjacent to the island. During the winter months, flocks containing hundreds of brants (*Branta bernicia),* a small sea-goose that summers in northern Canada, make their appearance in the offshore waters of Assateague Island. Neotropical migrants are also common during both the spring and the fall period, with several species nesting in both the shrub and the upland forest areas of the island. Summer "visitors" include the brown pelican *(Pelecanus occidentalis),* a federally endangered species.

Piping plovers (*Charadrius melodus)* a federally listed species, arrive at Assateague Island, attracted to the island's sandy, storm washed beaches which they use to both rest and feed. After spending the summer months hatching and fledging their chicks, the plovers depart in August for their wintering grounds in the Bahamas and the southeastern United States.

The American bald eagle *(Haliaeetus leucocephalus)* is also found on the island. One pair has maintained a nest on the southern end (Virginia) of the island since 1994 and a second pair has established a nest on the Wildcat Marsh area of Chincoteague Island since 1996. A pair of bald eagles has nested in the Green Run area of ASIS since 2000, successfully fledging chicks in two of the five years since then.

The salt marsh habitat provided by Assateague Island displays an amazing diversity of bird life and associated activities. During the summer months, wading birds like great egrets (*Casmerodius albus)* and clapper rails (*Rallus longirostris)* can be seen hunting in the shallow waters along the marsh edge. Red-winged blackbirds (*Agelalus phoeniceus)* feed among the taller reeds and rushes situated along the margins of the marsh. During the winter months, northern harrier (*Circus cyaneus)* use these areas as hunting grounds, flying low over the marsh grasses as they scan for small mammals and other birds.

A considerable number of species find shelter and feeding opportunities in Assateague upland forests. Ruby-crowned kinglets (*Regulus calendula),* downy woodpeckers (*Picoides pubescens),* and white-eyed vireos *(Vireo griseus)* utilize the forest to provide abundant insect life as a source for their food. During the evening hours, several species of owls become active; feeding on small mammals, snakes, and birds. These include the great-horned owl (*Bubo virginianus)* and the saw-whet owl (*Aegolius acadius).*

Although it has *not* been identified as currently being a resident of the island, the federally endangered red-cockaded woodpecker (*Picoides borealis),* was once a resident in the same county in which the seashore is located; Worcester County, Maryland (MD Chesapeake Forest Assessment 2002). It is found in pine timberlands throughout those portions of the southeastern United States

where its critical habitat is found. The woodpecker's habitat requirements are such that they seek out areas populated by mature pine forests (40-60 years age) with a relatively open understory. Mature loblolly forests, such as those found on Assateague Island National Seashore, represent potential suitable habitat for this species. In addition to the mature pines they prefer for breeding and nesting, they also prefer a relatively open understory of grass and herbaceous species as a part of their habitat preferences. The presence of sufficient arthropods to support nutritional requirements is also an important habitat requirement. Although there are currently no immediate plans to re-introduce this species to the island, the preservation and enhancement of this valuable habitat on the island is certainly a worthy objective, particularly in light of the shortage of suitable habitat for this species nationwide and the rapid rate of development in Worcester County. *There is currently no recovery effort planned for this species on either Assateague Island or the mainland in Worcester County.*

Reptiles

Assateague Island National Seashore and surrounding waters are home to 38 species of reptiles (NPSpecies 2005). Almost all of these species possess special adaptations that allow them to thrive in the often harsh climatic conditions found at Assateague. For example, the box turtle (*Terrapene Carolina),* one of the island's terrestrial reptile species, has the ability to retreat completely within its shell and will burrow under vegetation in order to escape extreme weather conditions. Assateague is home to five species of freshwater aquatic turtles and three species of sea turtles, including the official Maryland State reptile, the northern diamondback terrapin (*Maleclemys terrapin terrapin),* although this species prefers estuarine habitat and is most common in the salt marsh habitat on the western side of the island.

Though not common in abundance, lizards can occasionally be seen on the island. Both five-lined skinks (*Eumeces fasciatus)* and northern fence lizards (*Sceloporus undulates hyacinthinus)* live in the forested and shrub-thicket habitat found on the island.

Of the nineteen species of snakes living on the neighboring mainland of the Delmarva Peninsula, only six are found on Assateague Island, and they are all non-venomous. Some of the most wide-ranging species like the black rat snake (*Elaphe obsoleta obsoleta)* can be found in most of the island's habitat types. The eastern hognose snake *(Heterodon platirhinos),* which is often mistaken for the venomous copperhead*,* prefers beaches, dunes, and grassy, open areas, while the northern water snake (*Nerodia sipedon)* prefers salt marshes and fresh or brackish ponds.

Sea turtles, such as the Atlantic loggerhead (*Caretta caretta*), the common green sea turtle (*Chelonia mydas),* and the leatherback turtle (*Dermochelys*

coriacea) utilize the off-shore ocean habitat of Assateague. The loggerhead is a federally threatened species. It is also listed as threatened by the state of Virginia.

Amphibians

Seven species of frogs and toads have been identified on Assateague Island. Of the seven, Fowler's toads (*Bufo woodhousil fowleri),* green tree frogs (*Hyla cinera),* gray tree frogs (*Hyla versicolor)* and southern leopard frogs (*Rana sphenocephala)* occur throughout the entire island. The other resident species; New Jersey chorus frogs (*Pseudacris triseriata kalmi),* bullfrogs (*Rana catesbeiana),* and green frogs (*Rana clamitans melanota)* are more commonly found on the Virginia (southern) end of the island where freshwater impoundments associated with the Chincoteague National Wildlife Refuge offer substantial breeding habitat. As with many species, environmental factors play a major role in limiting diversity of amphibian species on Assateague Island. Scarcity of freshwater habitat and high levels of salinity are the major factors that limit amphibian diversity. By comparison, the neighboring mainland is home to 29 species of amphibians. Despite the limited number of species present on Assateague Island, amphibians play a key role in ecosystem sustainability, preying on a wide variety of insects and helping to maintain a balance in population levels.

Invertebrates

Numerous invertebrates such as fiddler crabs (*Uca sp.)* and mud snails (*Nassarius sp.)* play key roles in maintaining the health of the island's salt marshes. Beach habitat is home to nocturnal ghost crabs (*Ocypode quadrata).* The blue crab (*Callinectes sapidus),* is commercially important to local crabbers and fishermen.

The presence of variable habitats at Assateague Island National Seashore and the species that they engender underscores the need for preservation and enhancement, where practicable, of those areas where these diverse habitats are found.

- **Vegetation**

From the sand covered beaches found along Assateague Island's seaward side to salt marshes on the western bays, Assateague is host to a wide variety of vegetative communities. A diverse array of environmental conditions; variances in elevation, the availability of fresh water, distance from the ocean, the movement of sand, storm-driven winds and seas, all work to shape these communities, with each species developing adaptations to the unique challenges of the particular vegetation zone in which it lives. A National Vegetation Classification System survey of the island completed in 1995,

identified a total of twenty-five separate vegetative types found within the seashore boundary; four forest, eight shrubland, eleven herbaceous, one sparsely vegetated, and one woodland. In order to better understand vegetative composition for the purposes of this assessment these vegetation classes have been further grouped into five general categories; beach, dune grass, shrub, upland forest, and marshes (freshwater and saltwater/ brackish).

The least diverse of the island's upland plant communities is the beach community. Plants living on the beach and the first dune developments are exposed to constantly shifting sands, limited fresh water, extremes of both temperature and wind, and exposure to frequent salt water, either directly in the form of tidal surges or in the form of salt spray from wave generation. Less than 1% of the available area has vegetative cover due to the harsh conditions present. Despite the difficult conditions, in years in which rain is abundant, vegetative cover in this zone often increases beyond the typical sparse coverage found during normal years. The beach extends from the intertidal zone into the first set of dunes found along the entire east and south sides of the island. Plants like sea rocket (*Cakile edentula*) and sea lavender (*Limonium carolinianum*) have adaptations that allow them to survive the difficult environmental conditions to which they are subjected.

A gradual transition to the dune grass community begins above the high tide line. Dune grass establishes itself readily on the stabilized dunes as well as in other natural areas. Plants such as American beach grass (*Ammophila breviligulata*), salt meadow cordgrass (*Spartina patens*), seaside goldenrod (*Solidago sempervirens*), dune sandspur (*Cenchrus tribuliodes*), rough button weed (*Diodia teres*), carpetweed (*Mollugo verticullata*), and sea beach evening primrose (*Oenothera humifusa*) are common in this zone and contribute to dune stabilization primarily through adaptations that allow stems to proliferate when buried, helping to bind the substrate and thereby reduce erosion.

Shrub communities on Assateague establish themselves on or behind dunes, in protected depressions, and along the edges of marshes, with characteristic species growing in each location depending upon levels of salinity and moisture present. In the more sheltered zone beyond the dunes where fresh water is more plentiful, vegetative cover increases considerably, typically in the 70-90% range, and is predominantly characterized by less salt-tolerant shrubs and thickets. The actual vegetative composition of the shrub community varies with the availability of a variety of factors, including; groundwater, elevation, proximity to salt spray, and frequency of overwash or other flooding. In general, this vegetative zone extends east and west on barrier flats and back dunes, gradually emerging on the east with the dune grasses and on the west with the upland forest or marshes. One of the most distinctive shrubs found at the seashore is the beach heath (*Hudsonia tomentosa*), a dense, low shrub common to dunes and other sandy areas. Taller plants in this zone are

subjected to a natural “pruning” process, as salt laden winds blowing over the dunes limit the height of the shrubs and small tress with which they come into contact. Although shrubs are the dominant vegetative form, deciduous trees and vines may also be found, often in profusion and abundance. Common species include wax myrtle (*Myrica cerifera*), northern bayberry (*Myrica pensylvanica*), black cherry (*Prunus serotina*), common persimmon (*Diospyros virginiana*), Canada serviceberry (*Amelanchier canadensis*), blackberry (*Rubus argutus*), poison ivy (*Toxicodendron radicans*), and greenbriar (*Smilax spp*.). In addition, Virginia red cedar (*Juniperus virginiana*), and American holly (*Ilex opaca*) also occur with some degree of frequency. Most of the evergreen shrubs in this zone may also be found in the upland forest community. Marsh elder *(Iva frutescens*), which is capable of tolerating brackish or saltwater, dominates the shrub thickets surrounding salt marshes on the bay side of the island and marks the transition between upland areas and the marsh.

In the central portions of the island, where the width of the island generally allows for sufficient protection from the effects of salt spray and overwash, upland forest communities of trees have been able to establish a foothold. The majority of the large trees on the island are evergreen, with loblolly pine (*Pinus taeda*) comprising the dominant species, both in size and occurrence. Interspersed among the pines are found such deciduous species as red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), persimmon (*Diospyros virginiana*), sassafras (*Sassafras albidum*), and several species of oak such as southern red (*Quercus falcata*) and water oak (*Quercus nigra*). Other evergreen species present in these forested areas include American holly *(Ilex opaca*), red cedar (*Juniperus virginiana*), and Virginia or scrub pine (*Pinus virginiana*). Understory vegetation is composed primarily of such species as Greenbrier (*Smilax rotundifolia*), muscadine grape (*Vitis rotundifolia*), dogwood (*Cornus florida*), high bush blueberry (*Vaccinium corymbosum*), blackberry (*Rubus argutus*), poison ivy (*Toxicodendron radicans*) and common choke cherry (*Prunus virginiana*). Some of the island’s rare plants are found in these upland forest habitats. Among them Indian pipe (*Monotropa unifloria*), crested yellow orchid *(Habenaria cristata*), spotted wintergreen (*Chimaphila maculate*), and partridgeberry *(Mitchella repens*).

Marsh communities on Assateague Island are varied, ranging from large areas that are subjected to the effects of tidal flooding to smaller freshwater marshes. Salt marshes are found in abundance along the entire length of the western side of the island. The regularity of tidal flooding influences to a great extent the distribution of salt marsh vegetation. Smooth cordgrass or salt marsh cordgrass (Spartina alterniflora) is the dominant species in the low marsh, the zone that is found between the mean high and low tide line. Typical associates are saltgrass (*Distichlis spicata*) and black rush (*Juncus roemerianus*). These warm season grass areas serve as important habitat for wildlife, both terrestrial and marine. Salt marsh cordgrass (*Spartina patens*) mixed with saltgrass *(Distichlis spicata*) and saltwort (*Salicornia europaea*) grows in the less frequently flooded

high marsh.

To a lesser degree, freshwater marshes and species that utilize these types of habitat are found in areas where depressions have formed in dune and forested areas. These mini-wetlands provide natural reservoirs for freshwater, trapping and hold rainwater for extended periods of time, providing an important source of freshwater for plants as well as serving as sources of drinking water for island wildlife. The majority of the freshwater marshes on Assateague Island may at times become brackish, and are inhabited by plants that have a limited tolerance for saltwater. For example, the beautiful Rose pogonia (*Pogonia ophioglossoides*) thrives in these types of moist areas, displaying a single pink flower in the late spring. Characteristic plants include narrow-leaved loosestrife (*Lythrum lineare*), swamp rose-mallow (*Hibiscus palustris*), rushes (*Juncus spp*.), umbrella-grass *(Fuirena pumila*), and Virginia button weed *(Diodia virginiana*).

A more transitional fresh water marsh borders the upland areas of the island and the extensive salt marshes on the western side of the island. Common species include common reed (*Phragmities australis*), eastern baccharis (*Baccharis halimifolia*), cattails (*Typha augustifolia*), wax myrtle (*Myrica cerifera*), swamp rose (*Rosa palustris*), and American Elder (*Sambucus canadensis*).

The presence of a significant number of invasive and non-native species presents potential problems to the seashore. The combination of a wide variety of habitat types, ranging from upland forest to wetlands, provides ample opportunities for the invasion of a wide range of invasive plant species. A comprehensive inventory of non-native invasive species has identified a total of 157 non-native vascular plants within the boundaries of the seashore. Vegetative species causing the greatest concern, based upon their presence and potential to infest natural island ecosystems are: Asiatic sand sedge (*Carex kobomugi*), a recently discovered species that impacts the already imperiled sensitive dune habitat, and common reed *(Phragmites australis*), vigorous colonizer that can dominate marsh habitat if not treated. These two species were singled out for special attention in the Assateague Island National Seashore Document entitled; Resource Management Critical Issues (2004).

Asiatic sand sedge invades wash habitat occupied by such species as the federally protected plant sea beach amaranth (*Amaranthus pumilus*), which is a poor competitor and does not fare well in establishing itself in the presence of the sand sedge (*Plant Conservation Alliance, Alien Plant Working Group Fact Sheet*). On established, vegetated sand dunes, Asiatic sand sedge can out-compete native dune binding grasses such as American beach grass (*Ammophila breviligulata*) and sea oats (*Uniola paniculata*). Dunes dominated by Asiatic sand sedge are also more vulnerable to wind blowouts and storm erosion. There is evidence to suggest that fewer native plant species, and

fewer individuals, occur on dunes dominated by Asiatic sand sedge than on comparable dunes dominated by Native American beach grass (PCA Alien Plant Working Group 2005).

Although common reed (*Phragmities australis*) has been identified in components of salt marsh sediments exceeding three thousand years (Niering and Warren 1997), thus technically qualifying it as a native species, the growth of the species in its native condition was likely to have been significantly different than the dense monotypic stands that now characterize many areas on the seashore. In cases where common reed is found as a significant component of the vegetation community, the tall, leafy plants typically totally exclude the presence of other vascular plant species, creating an unhealthy or degraded habitat.

Assateague Island National Seashore has identified 31 invasive species from the total of 157 noted in the previous paragraphs, that seashore management feels are likely to be controlled by their integrated invasive plant management program, including such species as tree of heaven (*Ailanthus altissima*), Asiatic sand sedge (*Carex kobomugi*), spotted knapweed (*Centaurea maculosa*), autumn olive (*Elaeagnus umbellata*), Japanese honeysuckle (*Lonicera japonica*), Chinese lespedeza (*Lespedeza cuneata*), purple loosestrife (*Lythrum salicaria*), common reed *(Phragmites australis*), and multiflora rose (*Rosa multiflora*).

A major infestation of the southern pine beetle (*Dendoctronus frontalis*), an insect that attacks southern yellow pines, including the loblolly pine, occurred on Assateague Island in 1982 and again in 1994. The effects of these infestations were particularly severe on the southern (Virginia) end of the island. The long term effects of drought are thought to have exacerbated the effects of the infestation on the overstocked and mature trees in particular. During the outbreak in 1982, stands were further weakened by a September 1985 hurricane, and spread of the damage accelerated in 1986. In each case, it was not uncommon for hundreds of acres of trees to be impacted by the effects of the beetle and accompanying weather. Since neither of these agents is expected to disappear from exerting their influence upon Assateague Island, it is reasonable to expect that future outbreaks may again occur. Almost all of the forested areas on Assateague Island are at least 40 years of age and perhaps older. The combination of advancing age and dense stocking are major contributing factors to the structure of the loblolly-dominated forests on the seashore. The presence of these even-aged stands of trees, most of which are nearing maturity (40+ years), potentially places a great many of the loblolly pines at elevated risk to wildland fire due to the increased susceptibility of older trees to disease and storm damage.

The history of weather and its impacts on Assateague Island's vegetation are well documented. Even under normal conditions, the impacts of salt spray and

salt water intrusion caused by changes in weather patterns have major impacts on vegetation at Assateague. The potential exists for extreme weather conditions, particularly hurricanes and tropical storms, to impact the seashores vegetative resources, particularly those associated with beach, dune, and forest systems. Salt spray is transported by high winds and can have deleterious effects on vegetation as can the effects of salt water intrusion caused by higher then normal tides. High winds associated with intense storms, often accompanied by intense periods of ground-soaking moisture, have the potential to uproot trees and break the tops out of many more. In addition, the presence of a large number of dead and downed trees, resulting from insects and diseases as discussed in the previous section, would also provide for an increased level of fuel loading that can be expected to lead to intensified danger from wildland fire under certain environmental conditions. Saltwater overwash resulting from storms, often invades the shrub zone and kills many of the plants living there. These areas, where there are excessive loads of dead and downed fuel, present a wildland fire risk. On Assateague Island, environmental conditions that favor the start and propagation of wildland fires are usually manifested by periods of extended drought and drying of forest fuels. From an ecological standpoint, periodic but totally unpredictable storm events serve much the same role as a wildland fire. As was discussed earlier, the impacts of salt spray and overwash set back the succession in many species, contribute to the extended mortality of others, and are largely instrumental in creating gap openings in the forest canopy, allowing and even encouraging new growth in the understory.

- **Forest Insects and Diseases**

  The southern pine beetle has infested small portions of pine stands on Assateague Island, primarily in the Virginia FMU, but the effects have been minimal. Due to concentration of pines in some seashore forests, the potential exists for significant changes in the forest community in the event of a large-scale outbreak in the future.

- **Fire Effects**

  Grass Fuels

  Fires within the grass fuel models of ASIS run the full gamut of fire behavior from those that generally exhibit low to moderate intensity of short duration to those that exhibit high intensity and short duration. The latter are reflected in some marshland grass fuel types. Fires within theses fuel types can spread very rapidly under the influence of high winds. Fire intensity is generally sufficient to consume most herbaceous surface fuels, kill shrubs, and scorch trees where present. Cool weather grasses seldom cure completely and will only carry fire during extremely dry conditions. Conversely, warm weather

grasses will cure annually, and fire can be used to maintain these populations and help check encroaching woody species.

Brush Fuels

Brush fuels can be found in abundance over much of the seashore. Of particular importance are those areas where mature brush (6 ft>) is located in conjunction with overstory of pines and mixed hardwoods. In many of these locations the presence of the mature brush allows ground fires the opportunity to move into the overstory; potentially making a transition from a ground fire to a crown fire. Brush fuels in this category are most susceptible to the effects of drought. Their waxy and resinous leaves and stems are particularly flammable during the periods of time when these conditions are present. In other areas where brush fuels are lower to the ground, they represent less of a threat from a fire suppression standpoint. Flammability in these fuel types may be significantly increased in all situations by the presence of needle-cast from overstory trees, usually loblolly pine, draped on branches and twigs.

Timber Fuels

Fires within the pine and mixed hardwood/pine forests of ASIS are generally restricted to surface fuels, consuming leaf litter and branchwood, and reducing reproduction. Under most conditions, such fires are of low intensity and short duration. Fire effects include the removal of surface fuels, occasional scorching of trees, and the reduction of young woody reproduction. Under severe conditions, such as those driven by high winds and low humidity, usually accompanied by drought, the potential exists for fires to transition into brush and fuels that can be found in relative abundance in some forest areas. Crown fires are very unlikely to occur at ASIS, though these types of fires can result in the torching and subsequent loss of individual and isolated groups of trees. Fires of this type, while rare, can and do allow for extreme fire behavior with accompanying loss in vegetation, including some larger trees where scorch heights exceed 10 ft.

Larger mature trees (greater than 6" dbh) are susceptible to basal fire injury, but generally do not reduce diameter growth unless the crowns are appreciably damaged by fire. Damage to the cambium of larger trees is directly related to season of fire occurrence, intensity, duration of heat, bark thickness, and frequency of burning. Trees are generally less susceptible to fire injury during the dormant season. Seedlings and saplings of tree species other than hardwoods (oak and hickory) are generally readily killed by fire.

Fire can play a significant role in both the pine and mixed pine-hardwood forest types found in the seashore. While the mixed oak forests may not be dependent on fire for their short-term maintenance, fire may still play a significant role in the regeneration of and long-term maintenance of oak species

on some poor quality sites. Conversely, mixed pine forests with a component of loblolly pine are much more dependent on fire for their maintenance.

Heavy Fuel Concentrations

In areas where beetle kill, overwash, and the effects of storms have caused the build-up of dead and down forest residue and brush to accumulate on the surface of the ground, fuel model descriptors fall into the range of values used to describe Fuel Model 10. The extent of these fuel types are generally limited to pine and mixed pine/ hardwood species in areas that have suffered damage by events such as hurricanes and/or the Southern pine beetle. Principle fire effects include the reduction of dead and down woody fuels. If manual reduction techniques are employed in the reduction of fuel loading in these areas, attendant debris removal by burning of slash piles may be undertaken. Care should be taken, however, to conduct such debris burning during periods of low winds and high relative humidity.

- **Air Quality:**

Assateague Island National Seashore is classified as a Class II Air Quality area. A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter, as specified in the 1963 Clean Air Act (42 U.S.C. 7401 *et seq*.). Further, the Clean Air Act provides that federal land managers have an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts. Fire management activities planned by the National Park Service which result in the discharge of pollutants are subject to, and must comply with, all applicable federal, state, interstate, and local pollution control requirements. The National Park Service submits project-specific prescribed burn plans for each planned application of prescribed fire to the appropriate state agency located in the area where the burn is scheduled for implementation: Maryland (Maryland Department of Natural Resources) or Virginia (Virginia Department of Forestry). These project specific plans include in-depth procedures for managing emissions, modeling results of predicted air quality impacts, and the identification of smoke mitigation techniques.

Assateague Island National Seashore is a part of the Northeast Coastal and Barrier Network (NCBN), consisting of eight National Park Service units located along the Northeast U.S. coastline. The air pollutants of concern for the NCBN are ozone and nitrogen deposition.

Assateague Island National Seashore is one of only two National Park Service units in the NCBN that conducts air quality monitoring on-site. An ambient air quality site at Assateague monitors nitrogen deposition (wet) as a part of the National Atmospheric Deposition Trends Program (NADP). A

portable ozone monitoring station will be deployed adjacent to the NADP station and will be in operation during the summer months for a period of 1-3 years. The intent is to develop baseline data regarding ozone concentrations in and around Assateague Island. The station is co-located with the NADP station located at the Assateague State Seashore Headquarters property adjacent to Assateague Island National Seashore on the mainland. Additional air quality monitoring is conducted by a variety of state and federal agencies, though none closer than 30 miles distance. Additional ozone monitoring data is gathered at a site located 30 miles to the north (Lewes, DE), and at a location near Seaford DE, which is 35 miles to the northwest of the seashore. The Blackwater National Wildlife Refuge, located 55 miles west of the seashore, gathers air quality date related to the Clean Air Status and Trends Network (CASTNET). To the north sites located at the Edwin B. Forsythe National Wildlife Refuge and at Washington D.C. provide air quality information as a part of the Interagency Monitoring of Protected Visual Environments (IMPROVE).

Assateague Island National Seashore is not found in a designated non-attainment area for ozone. Ozone is not directly monitored in either of the counties where the seashore is located, however, based upon the higher ozone concentrations in nearby counties to the west and north, it is reasonable to assume that National Ambient Air Quality Standards (NAAQS) at the seashore may be exceeded (figure 2). Despite the relatively long distance from industrial and urbanized areas, air pollution should still be considered to be a potential problem at the seashore. Of major concern is the fact that regional pollution from sources emanating from as far away as Washington D.C., portions of Delaware, and even Philadelphia in Pennsylvania are capable, under the correct atmospheric conditions, of exerting negative impacts on seashore air quality. Minor pollution originating inside the seashore generally takes the form of auto emissions, wind-blown dust, soil, and smoke from infrequent wildland fires.

The major pollutant in the smoke produced by prescribed fire is manifested in the form of particulate matter (PM2.5 and PM 10). This material is composed chiefly of a mixture of tars, soot, and other volatile organics (Stanturf 2002). Particulates are not the only emissions produced by fire. Besides carbon dioxide and water vapor, gaseous hydrocarbons, carbon monoxide, and nitrous oxides are also released. However, only a small proportion (less than 3 percent) of the total emissions of particulates, carbon monoxide, and hydrocarbons can be attributed to prescribed burning. By conducting prescribed burning under atmospheric conditions that encourage rapid mixing, the problems associated with high levels of carbon monoxide can be eliminated (Stanturf 2002). Unsaturated hydrocarbons result from incomplete combustion of organic fuels. Because of their high affinity for oxygen, these compounds may form photochemical smog in the presence of sunlight and oxygen-donating compounds. Methane, ethylene, and literally hundreds of other gases are released during prescribed burning. Most of the hydrocarbons released during

prescribed fires are quite different from those released in internal combustion engines (Stanturf 2002). Nitrogen oxides are not likely to be released in significant quantities during prescribed burning (Stanturf 2002). Nitrogen is volatized contingent upon the amount released into the atmosphere and depending upon such environmental factors as ambient air temperature and relative humidity. Sulfur dioxide emissions from prescribed fires are of minor importance since the sulfur concentrations of most forest fuels is less than 0.2 percent (Stanturf 2002).

- **Cultural Resources and Cultural Landscapes:**

  Assateague Island National Seashore is home to a variety of cultural resources. The majority of these were identified in a historic resources study completed in 1968 (USDI, NPS 1968). Historic structures and associated sites make up the majority of the cultural resources found on Assateague Island. These structures, as well as the sites and objects associated with them, are all that remain (historic and prehistoric) from the relatively brief periods when humans occupied Assateague Island. In addition, there also may be found a number of cultural sites that do not fit neatly into the aforementioned category. For example, a number of shipwrecks are known to be present within seashore boundaries. Four shipwreck sites in the Atlantic Ocean and several close to the waters edge have been identified. These generally are made visible from changes in beach structure caused by major ocean storm events. A lack of funding has been largely responsible for the inability of the seashore to conduct formal investigation into the presence or absence of prehistoric archeological sites. Occasional discoveries of aboriginal projectile points in the ocean surf zone constitute the only physical evidence of a Native American presence on Assateague Island. However, given the island's dynamic geophysical nature and the history of rapid movement landward, the potential for undiscovered prehistoric sites has generally been considered to be minimal.

  Without exception, the cultural resources found on Assateague Island are important vestiges of earlier time periods. They represent important elements of a cultural history that combine to tell the story of mankind's inability to establish a permanent foothold on the constantly changing island environment. They are important links to both the history and purpose of Assateague Island. These resources will be detailed in the following sections.

  Historic Structures:

  Assateague Island National Seashore contains a total of 8 historic structures that are listed on the National Park Service List of Classified Structures (LCS / 1999).

Maryland Fire Management Unit

Three structures located within the Maryland FMU are included on the seashore's List of Classified Structures: the Seaboard Oil and Guano Company, Green Run Cemetery, and the Pope Island Boat House. All of these structures have been determined to be ineligible for the National Register of Historic Places. The Pope Island Boat House was moved to its present location in the North Beach area of the seashore in 1978 after fire destroyed the remainder of the Pope Island Lifesaving Station in 1972. The Green Run Cemetery is largely stable, but is subject to ongoing encroachment form vegetative succession.

Virginia Fire Management Unit

The most important of the structures included on the List of Classified Structures includes five structures that are also eligible for the National Register of Historic Places; the Assateague Beach U.S. Coast Guard Station and the associated observation tower, boat house, garage (the original surf boat house), and the wharf and breakwater. With the exception of the wharf and breakwater, all of the Coast Guard Station structures are experiencing a low level of impact and, though structurally sound, are in almost constant need of restoration and/ or preservation. The wharf and breakwater are in poor condition as the result of their natural deterioration associated with the marine environment and periodic storm activity. These structures are also listed as Virginia State Landmarks.

The remaining structure that may be found on the List of Classified Structures is the ruin of the Seaboard Oil and Guano Company Fish Factory. Concrete foundations and masonry walls are all that remain of the factory. Even though the property is owned by the U.S. Fish and Wildlife Service, it has been recorded on the NPS list of Classified Structures (ASIS LCS 07748. The ruins do not meet the eligibility requirements for the National Register.

Archeological:

Maryland Fire Management Unit

The known archeological sites found within Assateague Island National Seashore are primarily related to historic operations of the U.S. Lifesaving Service and several small residential and commercial developments that remain from the late nineteenth and mid-twentieth centuries. The seven known sites include North beach, Pope Island, and Green Run Lifesaving Stations, the Birch Saltworks, Green Run Village, the Green Run Cemetery and Scott's Ocean House. All of these structures have been determined to be ineligible for inclusion on the National Register of Historic Places. In each case, the original

above-ground features associated with the sites have been lost through physical removal, fire, vandalism and theft, or natural deterioration.

The presence or absence of prehistoric archeological sites has not been formally investigated on Assateague Island. Occasional discoveries of aboriginal projectile points in the ocean surf zone constitute the only physical evidence of Native American use of the island. The potential for undiscovered prehistoric sites has generally thought to have been minimal, primarily owing to the changing nature of the islands position relative to the ocean and the mainland.

Cultural Landscapes:

Maryland Fire Management Unit

Designations of cultural landscapes are important to an understanding of the significance of Assateague Island National Seashore. They convey an important message about the dynamic nature of Assateague Island, and the largely unsuccessful efforts of man to establish a permanent foothold in an area dominated by a constantly changing environment of sea, wind and tides.

Perhaps it is most fitting that the primary cultural landscape at Assateague Island National Seashore is entitled the Assateague Island Landscape (CLI 300088). It encompasses the full range of cultural and natural resources that can be found on the island, in the water, and on the marshes surrounding the island, and provides an illuminating portrait of an Atlantic coast barrier island, it's natural and cultural history, and the contributions that its resources and residents have made to society.

There are eleven Hunting Lodge Retention Properties found within the boundaries of the Assateague Island National Seashore. A cultural landscape field survey was initiated in 2000 with the intent of ultimately determining eligibility for each of these properties for inclusion in the National Register of Historic Places. To assist in that process, a historic context study was completed (2005) that will provide information against which each of the properties (and associated landscapes) will be evaluated so as to assist in the determination of their eligibility for the National Register. It is expected that the evaluation process may be completed by late 2006 or early 2007. Until such time as those processes are complete and final decisions made concerning eligibility and further management action, each of the structures and associated landscapes will receive full consideration in this environmental assessment as being fully protected properties. The areas being considered are:

- High Winds
- Hungerfords
- Buntings

- Valentines
- Jackson-Green Run Lodge
- Peoples and Lynch
- Bob O'Dell Hunt Club
- Clemets Boat House
- Clemets Beach House
- Mussers
- Black Duck –Pope's Island Gun Club

Virginia Fire Management Unit

The second cultural landscape is the one associated with the U.S. Coast Guard Station at Toms Cove. In the context of the Cultural Landscape Inventory (CLI 300161)), it is considered a component landscape. The Coast Guard Station *landscape* was determined to eligible for the National register of Historic Places in 2004.

Objects (museum collection):

The majority of Assateague Island National Seashore's 2, 926 item museum collection are composed of natural history voucher specimens or other objects relating to the area's natural resources. The largest component of the natural history collection is a herbarium containing 217 plant species. Thirty-six objects in the museum collection are of a historical nature, composed primarily of materials relating to local U.S. Lifesaving Service and Coast Guard operations. In addition, a small number of objects relate to the residential and commercial development that occurred on the island in years past. A total of 1,028 archeological artifacts, aboriginal projectile points and other implements, are located in the collection. The balance of the collection is comprised of general biological specimens, and a few paleontological specimens, representing a variety of fossils of marine origin that have been found on island beaches.

Properties on the National Register:

See Historic Structures section above.

- **Adjacent Landownership:**

Ownership of Assateague Island is shared jointly by two federal agencies and a Maryland State Park. Through a combination of management agreements, each of the aforementioned agencies works cooperatively towards achieving the common goal of protecting and preserving the island's natural and cultural resources

The continuation of the existing working relationships and agreements regarding mutual fire protection activities such as fuels management, fire

prevention, fire suppression, and prescribed burning for resource benefit, is a primary goal of this fire management plan and will be discussed in greater detail in later chapters.

Maryland Fire Management Unit

In Maryland, land ownership is shared between the approximately 700-acre Assateague State Park and Assateague Island National Seashore (approximately 8,850 acres).

Virginia Fire Management Unit

The 8,440 acre Chincoteague National Wildlife Refuge is the primary land owner on the Virginia end of the island. National Seashore lands on this end of the island, primarily located on the Toms Cove Hook portion, are managed through a cooperative agreement between the US Fish and Wildlife Service and the National Park Service. The primary emphasis on seashore activities on this portion of the island is the operation of a visitor recreational program (visitor center, lifeguard-protected beach).

b. Strategic and Measurable Fire Management Objectives

1. Ensure that all wildland and prescribed fire operations result in no injuries to members of the public or firefighters.

2. 95% of all unscheduled wildland fires are controlled during initial attack (within 24 hours or <10 acres).

3. 100% of all prescribed fires are conducted consistent with Federal, State, and local smoke management requirements.

4. Manage suppression actions so that rehabilitation costs are less than 10% of suppression costs.

c. Management Considerations

The following constraints, considerations, and/ or decision criteria will influence all fire management activities within the fire management unit (FMU).

1. No unacceptable impacts to cultural or natural resources and/ or species of concern (threatened and / or endangered).

2. Ensure socio-political economic impacts, including wildland/ urban interface (WUI), are considered in developing implementation plans.

3. Ensure that the public, organizations, and cooperating agencies are aware of any suppression, hazard reduction, or prescribed fire operation that may have either a direct or indirect impact upon them.

d. Historic Role of Fire

Early explorers of the Atlantic coast, including Giovanni Verrazano (1520's), Jacques Cartier (1530), and Samuel de Champlain (early 1600's), described the forests of the coastline as being composed of open pine and hardwood stands with grasses underneath (DeViro, 1991). Many have suggested that these open forests owed their existence to the frequent presence of fire (Bartram 1791; Harper 1962; Van Lear and Waldrop 1989, and Frost 1988). Research of pollen records and sediment cores indicate that the pine-dominated forest and fauna of the coastal plain dates back at least 5,000 years before the present (Delcourt 1980, Watts and Stuiver 1980), and would have obviously pre-dated the visits of the first explorers by centuries. The average pre-European settlement fire frequency was on the order of 7-12 years for forests of the Eastern Shore of Maryland (Lower Eastern Shore Resource Assessment 1999), with higher frequencies of 4-6 years in the southeastern counties of Wicomico, Worcester, Somerset, and Dorchester (Frost 1988). These frequencies are somewhat high when compared to the northwest area as region. Since it is unlikely that lightning was a major contributor to these fires, Native American populations must have provided the source. Pyne (1982) concluded that fire in the region was predominantly a phenomenon associated with human activity. It is known that Native American tribes of the Eastern Shore used fire to periodically burn the marshes that were such important sources of food (mollusks, fish, furbearers, waterfowl, edible tubers, and seeds) (Pyne 1982). Fire would also have been a useful tool for herding game, enhancing visibility or access, and in retarding the invasion of woody growth in open areas where deer were easily found. As Native Americans moved to areas like Assateague Island during the summer months to escape the virulent marsh mosquito that lived in great abundance near their villages, they would likely carry their use of fire with them to their summer living/ hunting grounds; setting fires for the same purposes as on the mainland. More often than not, these fires would have spread into adjacent woodlands and, if of a sufficient intensity, created the open seedbed conditions conducive to the establishment of loblolly pine and similar species. Even today, the pattern of loblolly pine "islands" and "stringers" in and adjacent to marshes of the lower Eastern Shore is common (LES Resource Assessment 1999).

Another factor to be considered is the presence of forests on the Eastern Shore that are composed of a variety of oaks (Quercus spp.) If, as some researchers have suggested, oaks were the most prevalent species in pre-settlement times, then the possible role of fire in maintaining these forest types must also be considered. Frost (1988) stated that "Light, understory fires may have been the norm for millions of hectares of eastern hardwood forest…." Most oak species are mid-tolerant to intolerant of shade, indicating that disturbance is desirable in order to promote regeneration and growth. Furthermore, acorn germination and initial seeding establishment are most successful where light understory burns have scarified the

seedbed and reduced competition. The extensive presence of oaks on the Eastern Shore is an indicator that low-intensity understory fires were common, either as the result of intentionally set fires used in order to create open woods or drive game, or as the incidental result of land-clearing activity.

The displacement of the Native American population by European settlers in the seventeenth and eighteenth centuries may have had surprisingly little effect on the use of fire or the frequency of occurrence. Like the Native Americans, the settlers used fire extensively as a tool to clear land for farming and the building of homes. Techniques may have varied, from felling and burning rather than girdling and scorching, and more area may have been cleared, but the inevitable result was that some fires escaped and burned into adjacent woodlands. Accounts from the colonial period indicate that fire was also used to drive game, facilitate trapping, clear undergrowth for horse travel, enhance forage opportunity for livestock and free-ranging hogs, and even for clearing the woods of such nuisances as ticks and chiggers. So-called “woods burning” in the region remained common and unregulated until the early 1900’s. At about that time government agencies began efforts to ban fire use for reasons of “forest protection”. The advent of World Wars I and II underscored the need to “protect” forests from the “destructive” effects of wildlfire. As a result, forests were no longer subjected to periodic low intensity fire and forest composition and fuel loading began to change during the ensuing eighty+ years. Even with the extensive use of controlled burning in the southeast today, pine grassland communities are less common and contemporary forests, such as those on Assateague Island, often have a dense understory.

Despite all of the information contained in the last several paragraphs referring to fire and its role on the mainland, the fact remains that specific documentation of historic fires and fire use on Assateague Island are virtually non-existent, and as such, should perhaps be viewed as being anecdotal. Since the seashores establishment, wildland fire activity has occurred, though primarily as the result of human-caused activity. Because of the paucity of fire records, it is very difficult to interpret with any degree of certainty what the role and function of naturally occurring fire on the island truly has been. At this point in time, barring the availability of more definitive information, it would seem to be hyperbole to attribute major changes in current forest structure on Assateague Island to the effects, or lack thereof, of wildland fire occurrence, whether anthropogenic or otherwise. As time passes, ascertaining the role and relative importance of wildland fire in shaping ecosystem processes on Assateague Island is a goal that should be pursued.

e. Wildland Fire Management Situation

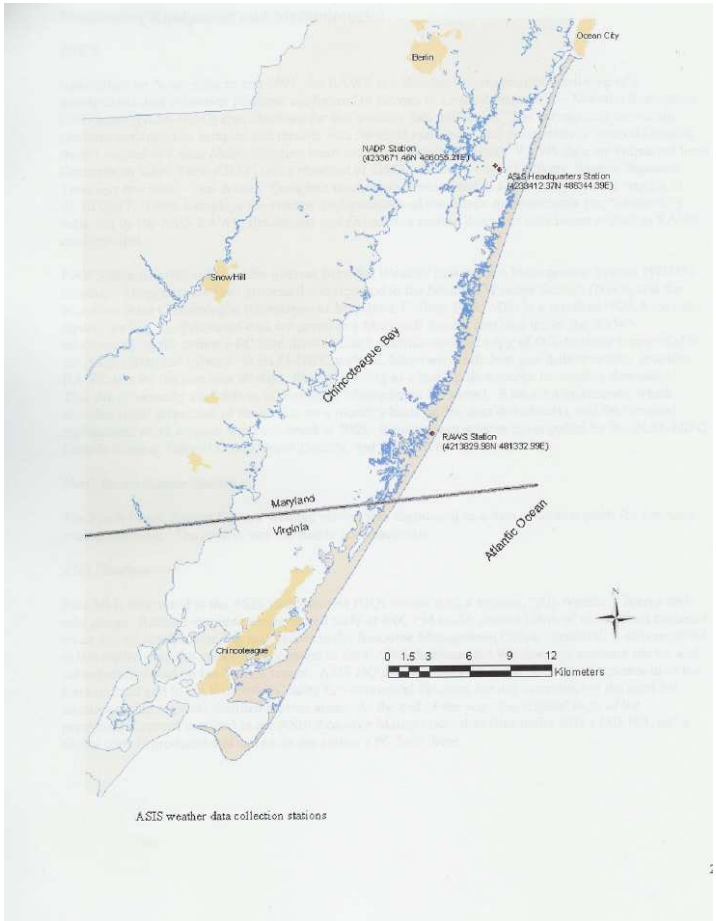
1. Historic Weather Analysis:

Barrier island ecosystems such as those at Assateague Island National Seashore are under the constant influence of meteorological events. Weather drives the basic physical processes that ultimately shape the coastal

environment; and extreme events, such as hurricanes and northeasters, can dramatically modify the geomorphology and character of the island. Weather phenomena also exert a powerful force over the composition, distribution, and dynamics of the island's diverse biotic communities. Since 1988, ASIS has monitored weather on a full-time basis from multiple weather stations located in and adjacent to the seashore (Figure 6). The primary data was gathered at the Remote Weather Station (RAWS). Three limited-capability data collections stations were maintained as sources of backup data to RAWS at: The North Beach Ranger Station, ASIS Headquarters, and the Assateague State Seashore Headquarters field (adjacent to the ASIS housing area located on the mainland).

Assateague Island has a humid, mesothermal climate characterized by a moderate to large annual range of temperatures that develop winter and summer seasons. Precipitation is recorded in all months and favors the development of forests. Prevailing winds are from the west. Weather systems generally move southwest to northeast. The influence of the Atlantic Ocean moderates the climate, reducing the extremes of summer heat and winter cold.

Figure 6

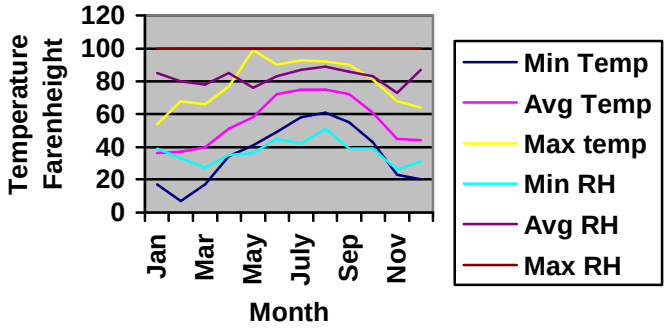


Temperature

Temperatures on Assateague are moderate. The growing season averages 215 days. The first killing frost occurs around November 15 the last killing frost about April 15. July and August are the warmest months while January and February are the coldest.

Table 1

ASIS Temperature/ RH 1995-2004



Precipitation

Abundant precipitation (greater than 2.0 inches) occurs in all months in most years. Topography does not significantly influence precipitation distribution on the island as all of the seashore is less than 50 feet above sea level.

The principal snowfall season is December through March, though historically measurable amounts sometimes occur in November and April. Snow does not generally remain on the ground for more than a few days at the most. Fog occurs when warm, moist air passes over the cold ocean waters. Fog is most common in winter and least common in autumn.

Showers and thunderstorms are not as common over Assateague Island as over the mainland, because cool water surfaces tend to reduce formation of strong vertical air movement necessary for thunderstorm development. Heavy rains may result from passing hurricanes, but this generally occurs only once every three- to four-years.

Table 2

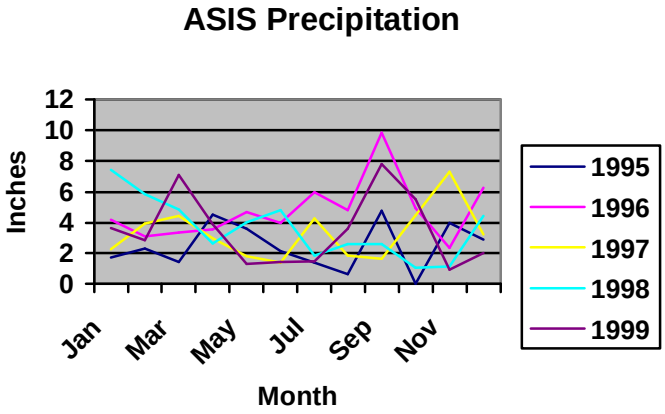


Table 3

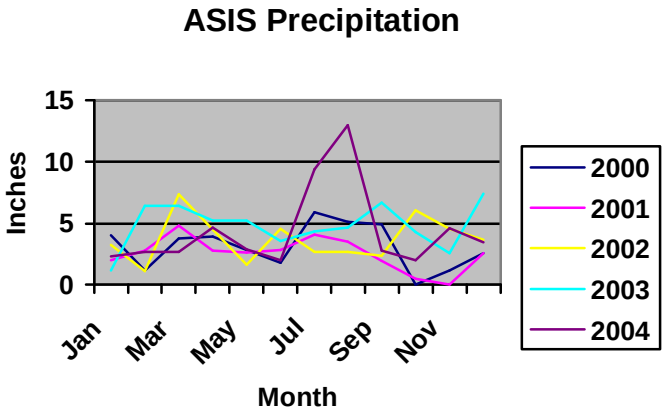
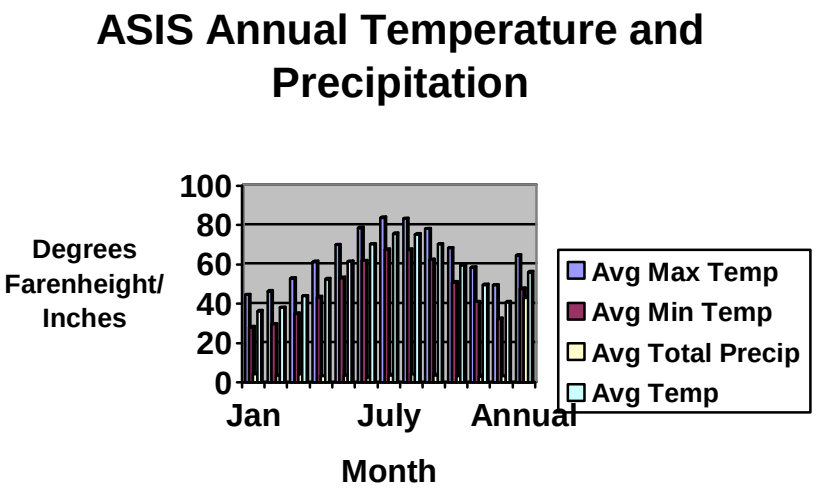


Table 4



Wind

The direction of the prevailing wind is from the south for the months of June through November and north -northwest from December through May. Strong winds are common on Assateague Island. Velocities of 16 mph or greater (20 foot wind speed) have been recorded for 19% of the summer observations; calm conditions were recorded for 8% of the observations. In winter, 35% of the observations were 16 mph or higher; and calm was recorded only 4% of the days.

Table 5

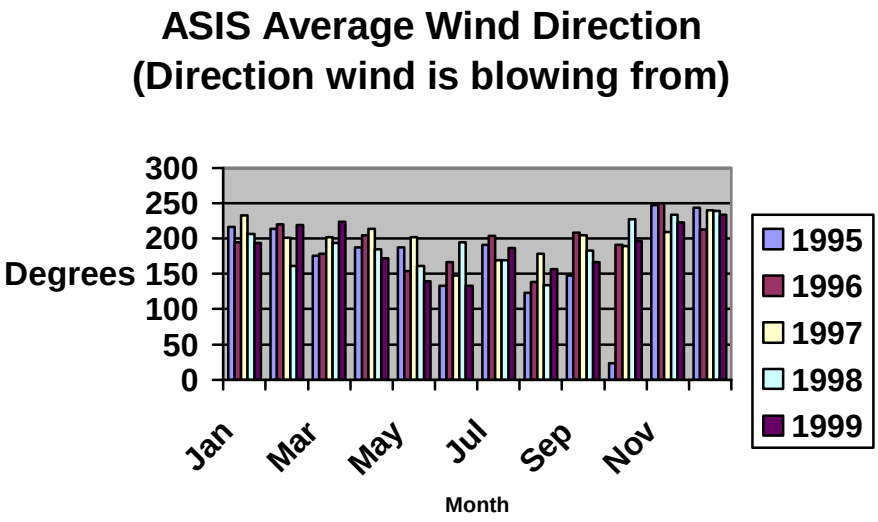
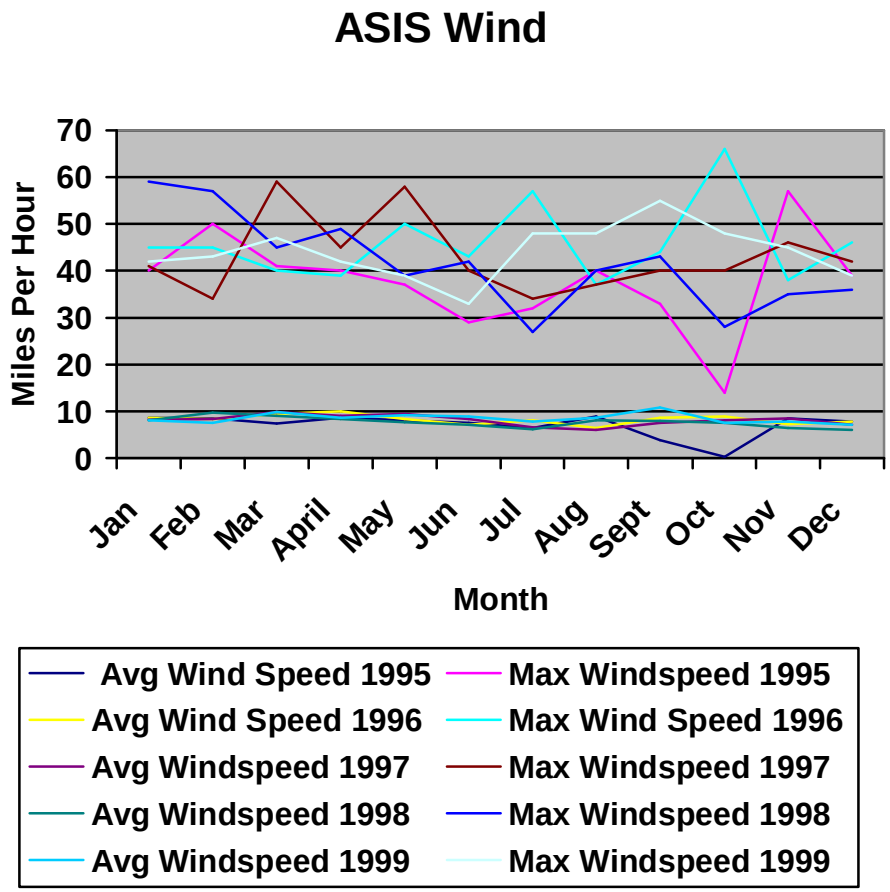


Table 6



Electrical storms with accompanying strong winds are frequent during the late spring and summer, especially during frontal passages. The seashore is rated at a National Fire Danger Rating Service (NFDRS) climate class 3.

2. Fire Season:

The Assateague Island National Seashore fire season extends throughout the year; however most fires occur between March and early November. There are formal historical reports for twelve wildland fires that have burned on the Island since the 1978 establishment of permanent record-keeping for the seashore. As might be expected, all but four of these fires were attributed to human causes as their ignition source. The Chincoteague National Wildlife Refuge, located on the southern end of Assateague Island, has a fire history almost identical to that found at ASIS. In looking at their fire history, 87% of all wildland fires occurred during the high-visitation months of May –October. Fire occurrence during the winter months, when human visitation is at its lowest, was virtually non-existent. A close examination of this data provides adequate justification for the use of a split fire season at ASIS; one that is relatively

characteristic of the entire mid-atlantic region, including the states of Maryland and Virginia. The spring-summer fire season begins on March 15 and extends until November 15th. The winter season or "off" extends from November 16 – March 14. These dates may vary depending upon frequency and duration of storms, drought, etc.

3. Fuel Types and Characteristics:

Fuels at ASIS can be divided into four broad categories: Grass, Brush, Timber, and Heavy Fuels (timber fuel model 10).

Grassland communities make up approximately 5375 acres of the seashore. The grass fuel types (short and tall) are primarily located in open fields, on inner dune meadows, in dry dune grasslands, in developed areas around structures, and in and around marshes and wetlands. Fire ignition and spread are governed by the fine herbaceous fuels that have cured or that are nearly cured. Included in this broad category are the largely open and fully exposed areas of the seashore that are composed of beach grass (*Ammophila spp*) (approximately 750 acres) where shrubs or scattered trees occupy less than one-third of the area. Also included are fresh-water marshes (approximately 1275 acres) and low and high salt marsh lands (approximately 3350 acres) composed largely of (*Spartina spp*.) and (*Carex spp*.) Depending on the amount of shrubs or trees establishing in these grassland areas, fuel models 1 and 3 best represent the fuel complex. Dunes populated largely by the species (*Hudsonia spp*, approximately 390 acres) may be represented by fuel model 1, although the fuels in these areas are so heterogeneous in their structure that fire spread would likely only occur under high wind conditions. In reality, these fuels are more likely to act as a barrier to fire spread, especially in areas of more continuous grass and/ or shrub fuels.

A fairly large percentage of the seashore contains fuels that are representative of the brush fuel model. In many cases, these areas may be found in combination with forested areas where pine species (chiefly *Pinus taeda*) are the primary overstory species, although these will be sometimes mixed with various hardwood species. Within these forest types are often found a dense and continuous layer of flammable ericaceous shrubs (fuel model 4) that provide an abundance of fuel throughout much of the year. Leaf litter provides a flash fuel and the dead twigs and branches present in the shrub layer will readily burn. The leaves and stems of these ericaceous shrubs readily sustain fire and carry heat and flames upward into the forest overstory. In most of these stands the dense shrub shrub layer provides a continuous horizontal and vertical source of available fuel. Shrub height varies from three to twelve feet. Flame lengths up to three times the height of the shrubs could occur under environmental conditions conducive to wildland fire. Volatile resins present in the leaves of the shrubs generate intense fires even during the growing season. In general, this fuel type requires more wind and drier conditions to burn than the grasses in the marsh, but will burn intensely even with relatively high fuel moistures and accompanying relative humidity. Accumulations of standing and dead shrubs aggravate this situation

by providing an ideally aerated fuel. Crowning and spotting are a danger, particularly in those areas where loblolly pines are present in abundance. Rates of spread, flame lengths, and fireline intensity, even under moderate conditions, often approach or exceed the levels at which hand crews can safely and effectively engage in suppression operations.

The effects of prolonged drought may change the flammability characteristics of certain fuels and cause attendant changes in fuel model designation.

Table 4 identifies the fuel models by vegetation type. The table also correlates the NFDRS and Fire Behavior Prediction System (NFFL) fuel models.

Table 7. Fuel Models by Vegetation Types

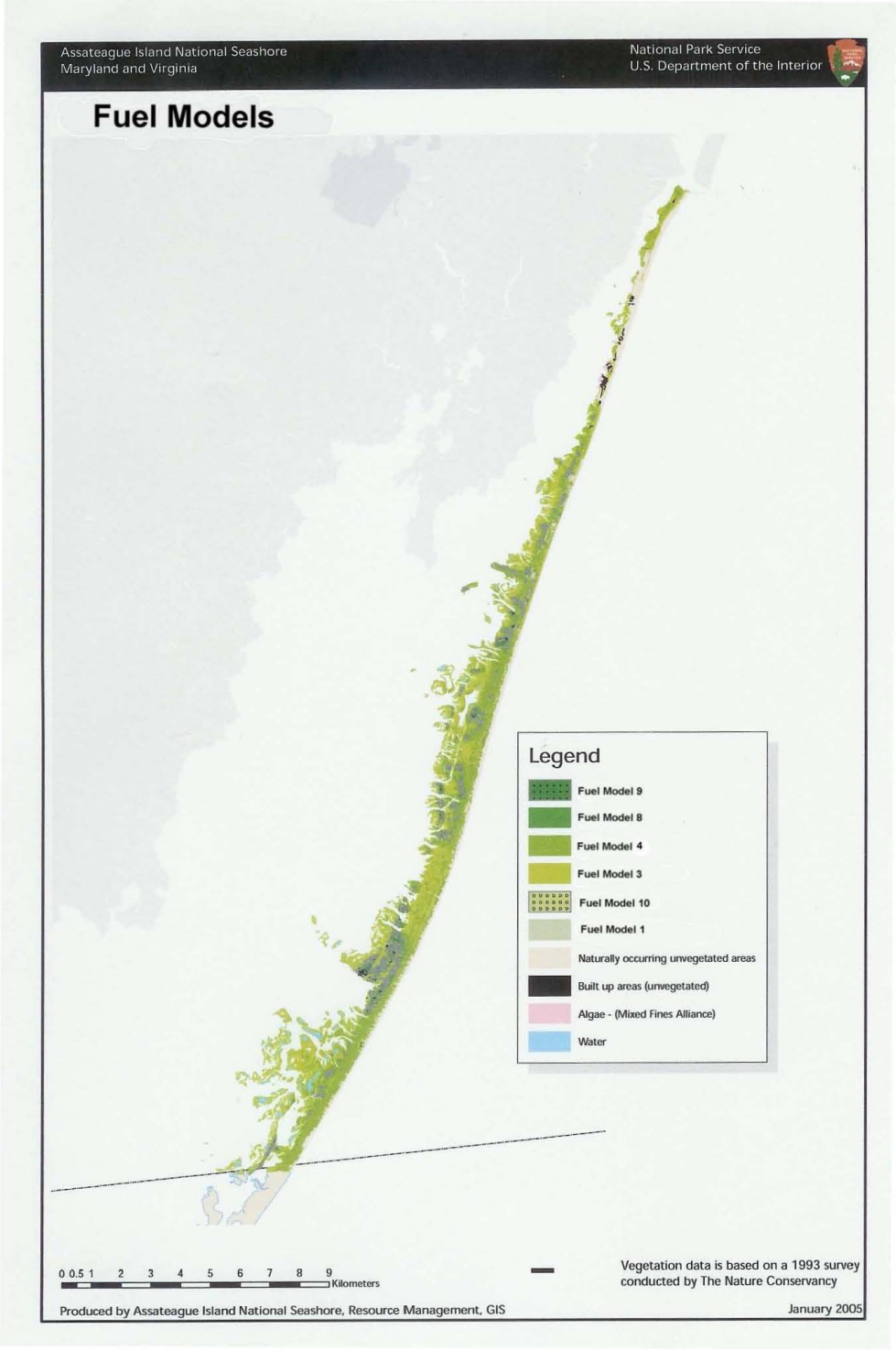
VEGETATION	NFDRS FUEL	FIRE BEHAVIOR NFFL/ FUEL
Grasses	L/N	1/3
Shrubs	B	4
Pine/Hardwood	E/R	8/9
Hardwood	E/R	8/9
Heavy Fuels	G	10

Fuel model NFFL 10 is representative of those areas at the seashore where accumulations of dead and downed fuel have accumulated largely as the result of hurricanes, salt spray, overwash, or insect infestations. It also applies for vegetation debris disposal that accumulates with such activities as maintenance and site clearing. This fuel model will help to identify the expected fire behavior during debris burns of accumulated fuels from manual reduction activities.

The following maps illustrate general fuel models for each of the FMU's of Assateague Island National Seashore. Fuel model maps supported by a detailed inventory have not yet been developed for ASIS, nor have fuel loading studies been completed to accompany these maps. However, by applying concepts discussed in the previous paragraphs, it is possible to get a relatively accurate general picture of fuel model distribution at the seashore. The interpolation of the heavy fuel model will be difficult until specific data on these fuel accumulations is surveyed and maps are produced. Once that process is completed it may be easily assimilated into this FMP.

Maryland Fire Management Unit (FMU) Fuel Models

Figure 7



Virginia Fire Management Unit (FMU) Fuel Models

Figure 8

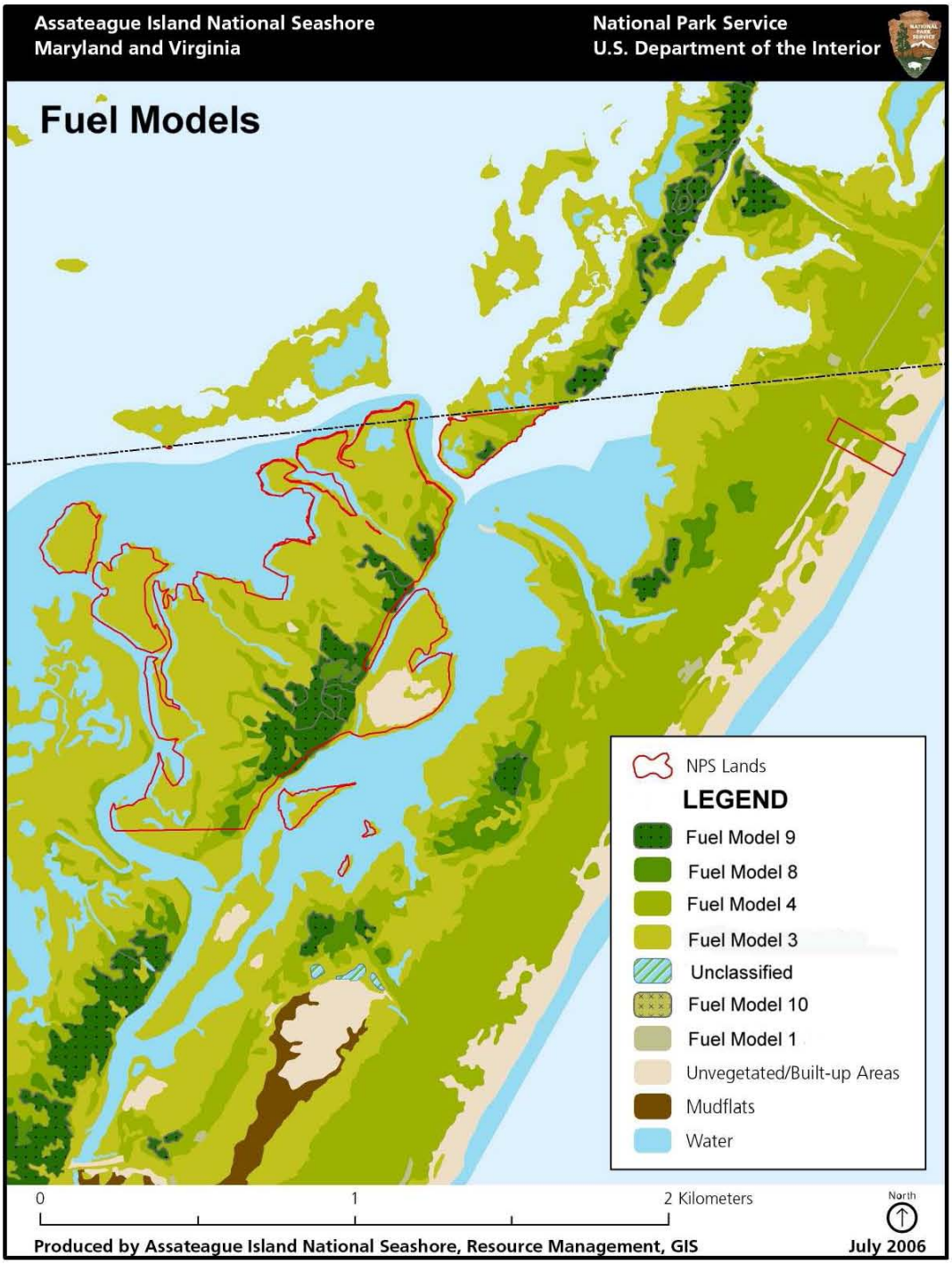
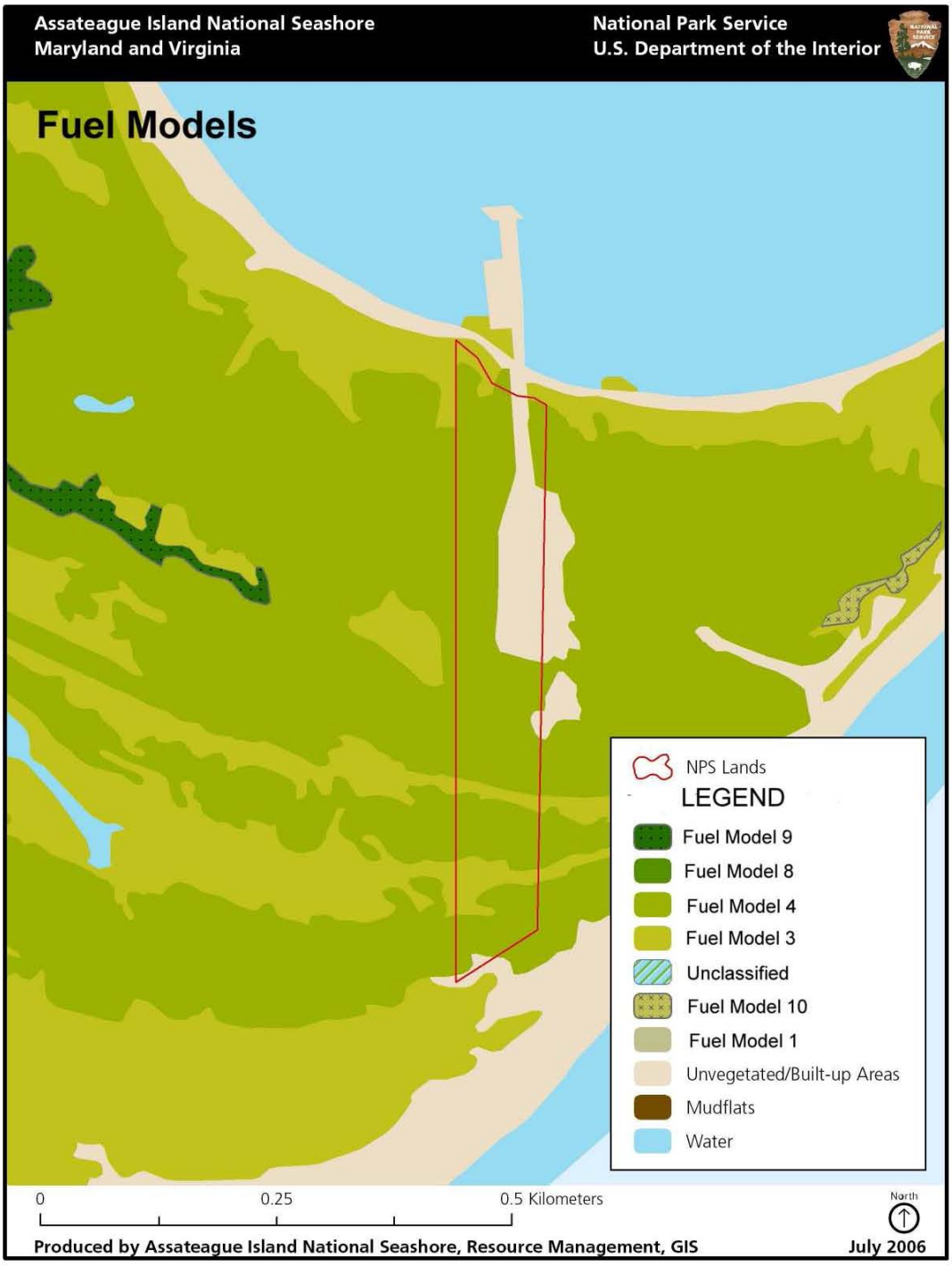


Figure 9


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Fuel Models
NPS Lands
LEGEND
Fuel Model 9
Fuel Model 8
Fuel Model 4
Fuel Model 3
Unclassified
Fuel Model 10
Fuel Model 1
Unvegetated/Built-up Areas
Mudflats
Water
0
0.25
0.5 Kilometers
North
Produced by Assateague Island National Seashore, Resource Management, GIS
July 2006

Figure 10


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Fuel Models
NPS Lands
LEGEND
Fuel Model 9
Fuel Model 8
Fuel Model 4
Fuel Model 3
Unclassified
Fuel Model 10
Fuel Model 1
Unvegetated/Built-up Areas
Mudflats
Water
0
0.25
0.5 Kilometers
North
Produced by Assateague Island National Seashore, Resource Management, GIS
July 2006

4. Fire Regime Alteration:

The displacement of the Native American population by European settlers in the seventeenth and eighteenth centuries may have had surprisingly little effect on the use of fire or the frequency of occurrence on Assateague Island. Like the Native Americans, the settlers used fire extensively as a tool to clear land for farming and the building of homes. Techniques may have varied, from felling and burning rather than girdling and scorching, and more area may have been cleared, but the inevitable result was that some fires escaped and burned into adjacent woodlands. Accounts from the colonial period indicate that fire was also used to drive game, facilitate trapping, clear undergrowth for horse travel, enhance forage opportunity for livestock and free-ranging hogs, and even for clearing the woods of such nuisances as ticks and chiggers. Fire was also used as a tool to improve forage for livestock and improving habitat for waterfowl. Burning of marsh areas was common as were escapes where these fires burned into adjacent forested areas. So-called “woods burning” in the region remained common and unregulated until the early 1900’s. At about that time government agencies began efforts to ban fire use for reasons of “forest protection”. The advent of World Wars I and II underscored the need to “protect” forests and marshlands from the “destructive” effects of wildlfire. As a result, areas were no longer subjected to relatively periodic low intensity fire and forest composition and fuel loading began to change during the ensuing time period. Even with the extensive use of controlled burning in the southeast today, pine grassland communities are less common and contemporary forests, such as those on Assateague Island, often have a dense understory.

Despite all of the information contained in the previous paragraph, the fact remains that *specific* historic documentation of past fires and fire-use on Assateague Island before the land was purchased by the federal government is sketchy, being mostly anecdotal in its content. Since the seashores establishment, wildland fire activity has occurred, though primarily as the result of human-caused activity. Because of the paucity of fire records, it is very difficult to interpret with any degree of certainty what the role and function of naturally occurring fire on the island truly has been. At this point in time, barring the availability of more definitive information, it would seem to be hyperbole to attribute major changes in current forest structure on Assateague Island to the effects, or lack thereof, of wildland fire occurrence alone, whether anthropogenic or otherwise. As time passes, ascertaining the role and relative importance of wildland fire in shaping ecosystem processes on Assateague Island is a goal that should be pursued.

On the basis of the best information available at this time, it appears the vegetation on the island, and in particular the forest component, can best be characterized as representing a fire regime that falls into *Condition Class 2.* Fire Regimes at the seashore appear to have been moderately altered from their historical range. Some elements of the ecosystem have been modified, perhaps, at least in part, from a departure of one or more fire return intervals from the natural fire frequency of the surrounding area.

Where appropriate, some areas of the seashore may need *moderate levels of restoration treatment,* such as prescribed fire and/ or the use of non-fire treatments, in order to restore natural fire regimes.

5. Control Problems:

The potential for control of wildland fires ranges from low to severe; being largely dependent upon site-specific environmental factors and types and amount of fuel available to burn. Under *normal* fire season conditions, control problems can generally be characterized as low to moderate. The potential for extreme fire behavior at Assateague Island National Seashore appears to be closely linked to the presence or absence of drought. Periods of drought can affect fire behavior in all fuel types and wildland fires can burn actively in all fuel models when the Keetch-Byram Drought[1] Index (KBDI) exceeds a range of 300-400. When the KBDI exceeds 500, wildland fires can exhibit extreme fire behavior and control and suppression problems are common. During these types of drought conditions, brush fuels that would normally be relatively resistant to the spread of fire, become more like dead fuels, playing an active role in the spread and propagation of fire. Low fuel moisture contents triggered by drought also affect dead and down fuel accumulations, causing them to contribute to increases in fire behavior and intensity. These changes can be expected to produce torching of individual trees and potential short and even long-range spotting.

In some areas, high stem density, abundance of ladder fuels, and closed crown stands of pines accompanied by blow-down could, under certain conditions, sustain a crown fire. This would lead to attendant potential for long-range spotting and wildland fire propagation. While the duration of such fire behavior would be relatively short, the effects on the soil and vegetation would be significant.

6. Elements Affecting Management:

The seashore is classified as a Class II airshed; smoke from any fire management operation is a primary concern from the standpoint of visibility and health.

The protection of seashore cultural resources is of paramount importance. Suppression actions may pose a greater threat to these cultural resources than the actual effects of a fire. Due to the presence of historic structures and important cultural resources at the seashore, a comprehensive Wildland Fire Prevention Analysis and Plan has been developed to assist management in taking proactive actions in order to afford these resources a high level of protection. This plan can be found in Appendix U.

The presence of a National Wildlife Refuge and a Maryland State Park adjacent to seashore boundaries presents unique opportunities to create and manage cooperative

[1] Keetch-Byram Drought background discussion and Indices may be obtained on the WFAS page at: http://www.wfas.us/content/view/32/49

fire management activities that will provide for protection from wildland fire across agency boundaries. While some formal agreements between these agencies already exist, the use of the full range of fire management activities should be fully explored and identified in formal written agreements, including the identification and protection of natural and cultural resources and the utilization of joint activities in managing hazardous fuels.

Virginia Fire Management Unit

ASIS retains responsibility for fire suppression activities at the Tom's Hook area (approximately 9 acres) located on the south end of Assateague Island. This location represents a high-density visitor use area and contains a number of highly visible and important cultural resources, including the historic U.S. Coast Guard Station and adjoining structures. At the present time ASIS does *not* have an agreement for mutual fire suppression with the Chincoteague Volunteer Fire Company, though it does have an active agreement in place with the U.S. Fish and Wildlife Service regarding cooperative efforts in wildland fire protection. ASIS should explore every opportunity to develop an effective written agreement with the Chincoteague Volunteer Fire Company regarding fire suppression on this section of the seashore.

7. Fire History:

During the twenty-seven years (1978-2005) that formal fire records have been maintained, Assateague Island National Seashore has experienced a total of 12 wildland fires, an average of 0.4 fires per year. Of this total, all but 5 were the result human-caused ignitions.

A complete list of the ASIS fire history can be found in Appendix L.

IV. WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

A. General Implementation Procedures

A Wildland Fire Implementation Plan (WFIP) will be initiated for all wildland fires. This plan will provide the framework for determining the appropriate management response during a wildland fire incident. The WFIP Stage I: Initial Fire Assessment will be the responsibility of the Incident Commander or the Seashore Fire Coordinator. Management response in both ASIS FMU's provides for suppression of all unplanned ignitions. The requirement for a decision checklist as a part of the Stage I analysis can be considered met. Subsequently, Stage I analysis may be satisfied at the programmatic level in the FMP through determinations made by combinations of values to be protected and/or fire behavior thresholds. A copy of the WFIP Stage I form can be found in Appendix E.

B. Wildland Fire Suppression

1. Range of Potential fire Behavior:

The fire behavior described below can be expected under *average* fire season conditions. A combination of drought, high wind, low humidity, excessive fuel loading, and high temperatures could greatly *increase* expected fire behavior.

Fire spread in fire behavior fuel model 1 (NFFL fuel model 1) is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Surface fires are represented by fires that move rapidly through the cured grasses and associated herbaceous vegetation. Generally, these types of fires are of moderate intensity with average rates of spread between 50 to 80 chains/hour and flame lengths of 3 to 4 feet.

The most intense fires in the grass group are found in NFFL fuel model 3. Generally these grasses are taller (3ft>) then those found in Fuel Model 1. This grass group displays high rates of spread under the influence of wind. Fires in the grass group fuel model exhibit some of the faster rates of spread under similar weather conditions, averaging 104 chains /hour and with flame lengths of up to 12 feet.

NFFL fuel model 4 is capable of providing fire behavior that exceeds the potential for hand crews to safely implement direct control operations. Flame lengths, particularly when live fuels are dry as the result of drought conditions, typically exceed 15-20 feet and have the potential to provide a fuel ladder into the crowns of adjacent trees where torching and spotting can easily occur. Even under normal conditions, flame lengths typically can exceed 13 feet. When encountered in continuous stands, with higher wind speeds, fire behavior can be expected to occur that will preclude direct attack by hand crews.

Slow burning ground fires with low flame lengths are generally the case in NFFL fuel model 8, as is evidenced by the one-foot flame lengths and average rates of spread of 6 chains/ hour that are typically present in these fuel types. Fire is supported in the compact litter layer. This fuel model is typical for winter and summer periods where fuel compaction and high moisture content are primary influences. However, these fuels can still pose fire hazards under severe weather conditions involving high temperatures, low humidity's, and high winds.

In NFFL fuel model 9, fires run through the surface litter faster than fuel model 8 (7.5 chains/hour) and have longer flame lengths (averaging 2.6 feet). Fall fires in hardwoods are generally predictable, but high winds will actually cause higher rates of spread than predicted because of spotting from rolling and blowing leaves. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

In heavier dead and down fuels, represented by NFFL fuel model 10, demonstrates fire behavior that could be fairly active. Depending on the location of the debris burning area, the shading from the overstory, and the aging of the fine fuels, the fire potential may be exacerbated or lessened. Generally, as the fine fuels burn and intensity increases, larger fuels are ignited and start burning. As the intensity builds, active flaming increases with significant amounts of firebrands being generated. These firebrands are often lifted high into the air on the convection column that forms as the result of the increased fire activity. Care should be taken, especially during windy conditions, to look for spotting that results from the firebrands spread as a result of this increased fire activity.

Table 8 illustrates the comparative rates of spread and flame lengths for different fuel models under average conditions (assume fine fuel moisture content of 8% and a mid-flame wind speed of 5 miles/hour).

Table 8. Comparative Rates of Spread and Flame Lengths for Fuel Models

NFFL FUEL MODEL	RATE OF SPREAD (Chains/Hour)	FLAME LENGTH (Feet)
1	78	4
3	104	12
4	39	13
8	1.6	1
9	7.5	2.6
10	6	4.2

Note: Flame lengths of 4 feet are considered the *maximum* that a hand crew can safely and effectively manage.

2. Preparedness Actions

a. Fire Prevention, Community Education, and Assistance Programs

A complete wildland fire and prevention analysis can be found in Appendix U. This plan presents, in detail, a site-specific analysis of structures and other capital improvements at the seashore, and how they may be protected from wildland fire through specific management prevention activities.

An active fire prevention program will be conducted in conjunction with adjacent agencies to protect human life and property, and prevent damage to cultural resources or physical facilities.

A program of public education regarding potential fire danger may be implemented. Visitor contacts, bulletin board materials, handouts, and interpretive programs will be utilized to increase visitor and seashore neighbor awareness of fire hazards.

It is essential that seashore employees and cooperators be well informed about fire prevention and the objectives of the fire management program. Further, employees must be kept informed about changes in existing conditions throughout the fire season.

Trained employees need to be able to relate to the public the beneficial effects of prescribed fires as opposed to unplanned human-caused or natural fires. Information must be included to emphasize the potential severity of human-caused wildfires and how to prevent them.

During periods of High, Very High, or Extreme fire danger, fire prevention messages will be included in interpretive programs. Emergency restrictions regarding fires or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by cooperators.

If prescribed fires, including debris burning, are being conducted at the seashore, signs at the Visitor Centers and bulletin boards will be used to supplement visitor contacts. These signs will be used to administratively direct, inform, guide, and caution visitors about existing fire conditions and prescribed fire activities.

Prior to the implementation of prescribed fire operations, written notification to adjacent and effected landowners will be made through a variety of appropriate methods, including individual letters, press releases and mass media releases.

Seashore staff will work with local fire departments, both paid and volunteer, the adjacent fire departments of the U.S. Fish and Wildlife Service, Maryland Department of Natural Resources (MD FMU), Virginia Department of Forestry (Virginia FMU) and other agencies with fire management responsibilities, to establish common protocols and procedures, identify and conduct training, and develop strategies for safer and more efficient fire management operations.

b. Annual Training Activities:

National Park Service Departmental policy requires that all federal personnel engaged in suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG, 310-1). The DOI incident qualification system meets or exceeds all NWCG standards. The seashore will conform strictly to the requirements of the NPS wildland fire management qualification and certification system for all of its employees. Employees of the U.S. Fish and Wildlife Service are federal employees and operate under the same standards as the National Park Service.

Firefighters that are not federal employees, such as those from the Maryland Department of Natural Resources, Virginia Department of Forestry and volunteer fire departments, are required to meet the training and equipment standards established by ***their*** organizations for the first 24 hours and/ or initial attack operations in the

seashore. After that time period, ***all*** firefighters will meet the standards set by the NWCG 310-1 as outlined in the section above. When possible, all wildland fire training should meet the highest standard of training as outlined in 310-1.

The Seashore Fire Coordinator will be responsible for organizing the training required to meet seashore expectations for red-carded firefighters. For practical purposes, this means that training can and should be established with local fire departments, since they will be providing some of the initial attack response for the seashore. The Seashore Fire Coordinator will work through the Area Fire Management Officer (SHEN) to obtain instruction assistance, funding, and enrollment assistance. The Seashore Fire Coordinator will coordinate seashore fire training needs with those of other nearby parks, cooperating agencies, and the region in concert with the Area FMO.

The Seashore Fire Coordinator will evaluate training needs for seashore personnel with their input. A priority will be placed on maintaining at least five employees qualified as Type 1 and 2 firefighters, and perhaps two additional employees as Incident Commander Type 4 and 5. The Area Fire Management Officer (SHEN) will be contacted about needed courses and regional funding for ASIS participation. Seashore supervisors will be contacted about employee interest in participating in fire suppression. The Seashore Fire Coordinator will decide the cost effectiveness of holding the courses at ASIS, or sending interested personnel to training outside the seashore. As with the other elements of this phase of the program, the Area Fire Management Officer at SHEN will provide guidance and direction in this phase of the fire management program.

In addition, during general seasonal orientation, all seasonal personnel will receive instruction in:

- Purpose and objectives of the fire management program.
- Prescribed fire actions conducted and planned.
- Use of fire in vegetation management.
- Public, employee, and firefighter safety during suppression and prescribed fire operations.

c. Annual Readiness Activities

The following outline details the calendar year fire management program for the seashore. These activities will be coordinated with the Area FMO (SHEN).

An annual preparedness activity schedule follows:

January

- Permanent employee's (those that are red-carded) physical fitness exams.
- Permanent employees' physical fitness testing complete
- Update the seashore fire callout list.
- Update fire experience and training records for red-carded personnel (this includes cooperators as well as seashore personnel).
- Submit updated red-carded personnel records and physical fitness scores to the Area FMO at Shenandoah NP (SHEN).
- Archive training and experience records of seasonal personnel.

February

- Meetings with cooperators; final review and revision of interagency agreements.
- Review and coordinate emergency dispatch procedures with the Area FMO and the Eastern Interagency Coordination Center (EICC) at Shenandoah NP.
- Semi-annual service of fire pumps, power saws and other power equipment. (if applicable)
- Prepare prescriptions and burn plans for prescribed fires (including debris burning) prior to implementation.
- Inventory fire cache and order (through Area FMO) all necessary fire items to maintain a fully stocked fire cache. Update the inventory list and make sure all equipment is in a fire ready condition.
- Review Step-Up Plan.
- Check established procedure for utilizing suppression and emergency preparedness accounts with the Area Fire Management Officer at SHEN.

March:

- Meeting and/ or discussion with Maryland Department of Natural Resources/ Virginia Department of Forestry regarding smoke management issues.

- Meeting or discussion with Area FMO at Shenandoah NP to review plans and current program.

- Meeting of Seashore Fire Committee to review approved Fire Management Plan revisions and plan prescribed fire activities.

- Meeting with cooperators to review approved Fire Management Plan revisions.

- Pre-season planning completed; all cooperative agreements revised and in effect.

- Issue red cards to permanent personnel.

- Coordinate fire weather program notification with National Weather Service (telephonic).

- Implement Step-Up Plan and adjust level of readiness in response to changing fire danger levels.

March 15 - November 30 (Fire season)

- Equip seashore vehicles with fire tools.

- Post fire danger posters as needed.

- Operate all motorized equipment (portable pumps/ power saws) at least twice a month.

May:

- Draft FIREPRO budget request and submit to Area FMO at Shenandoah NP.

June:

- Physical fitness testing for seasonal personnel.

- Issue personal protective equipment to seasonal personnel, if necessary.

- Participate in annual seasonal fire training.

- Issue updated fire call-out list to the Area FMO at Shenandoah NP, Regional FMO, nearby parks, and cooperators.

July:

- Conduct semi-annual service of pumps, power saws, and other fire equipment.

September:

- Meet with finance personnel on status of fire accounts and outstanding fire orders or requisitions.

November 16 - March 14 (winter season):

- Review fire management activities to ensure that all pertinent pre-season activities are carried out as necessary for next fire season.

December:

- Critique fire season. Evaluate individual performance of seashore staff to correct deficiencies and recommend personnel for training as possible.
- Review and revise Fire Management Plan as necessary.
- Review Interagency Agreements, draft revisions as necessary, and submit to the Superintendent for approval.
- Inventory fire cache and requisition replacement equipment and supplies to maintain approved levels (through Area FMO at SHEN).
- Submit proposals for annual training to Superintendent, through division chiefs, for review and approval.
- Forward nominations for interagency fire training to the Area FMO at Shenandoah NP and Regional FMO.
- Archive weather records (if applicable).
- Meeting of Seashore Fire Committee to review fire season and formulate program changes.
- Forward outstanding fire reports to Area FMO at Shenandoah NP and to Region.

d. Fire Weather and Fire Danger

Weather Station: Although ASIS has multiple weather stations, each having the capability to collect and store basic weather indices, *none* of them compute National

Fire Danger Rating System (NFDRS) data. As a result, the seashore does *not* possess the capability to collect or compute fire danger rating indices. Real-time weather data may be viewed directly from internet access to two of the weather stations that can be found in each of the Fire Management Units (FMU's); Maryland (located at ASIS) and Virginia (located at Chincoteague). Web site addresses are as follows:

Weather for the Maryland FMU:

http://www.met.utah.edu/cgi-bin/droman/station_total.cgi?stn=ASTM2&unit=0

Weather for the Virginia FMU:

http://www.met.utah.edu/cgi-bin/droman/meso_base.cgi?stn=CHNV2

Another source of valuable information is the National Weather Service Website for the Wakefield, Virginia Office. This is the NWS office that serves the area in which both of the Fire Management Units at ASIS are located. A daily "fire weather" forecast is available on the main webpage and contains valuable weather information as it pertains to fire. The weather zones for ASIS are: MDZ 024 (Worcester) and MDZ 025 (Maryland Beaches). The site address is:

http://www.erh.noaa.gov/er/akq/firemain.html

Fire Danger Rating System: **Fire Danger Rating System:** A Fire Danger rating level gives the land manager an idea of the potential level of risk present from a wildland fire over a fairly large geographical area. It is *not* intended to predict individual fire behavior. The development of a fire danger rating level is relatively complex and takes into account many variables such as current and antecedent weather information, fuel types and distribution, live and dead fuel moisture content, as well as topography and human-caused occurrence indices.

While the process of gathering data and determining the fire danger rating level is relatively complex, and is important to many fire management specialists, this Fire Management Plan is concerned with primarily the *output value* referred to as the ***adjective class rating***. It is this rating that is applied to specific unit criteria established in the seashore's Step-Up Plan that guides management in making a variety of decisions relating to wildland fire management. Instructions for acquiring the ***adjective class rating*** are contained in the following paragraphs. Questions pertaining to the structure of the National Fire Danger Rating System, its components, inputs or outputs, should be referred to the Area Fire Management Officer at Shenandoah National Park.

Procedures for accessing both the ***Observed Fire Danger*** and the ***Predicted Fire Danger for*** *the next day* are:

Step 1. Utilize the internet to access the NWS Wakefield web site:
http://www.erh.noaa.gov/er/akq/

Note: The information on this page allows access to a wide variety of National Weather Service Products.

Step 2. Click “Fire Weather” in left-hand column.

Step 3. Find Section titled “USDA Forest Service Links”

Step 4. Click “Wildfire Assessment System”

Step 5. Find “Fire Potential/ Danger” in left-hand column

Step 6. Click “Fire Danger rating”

Step 7. Under the heading “Current Conditions”

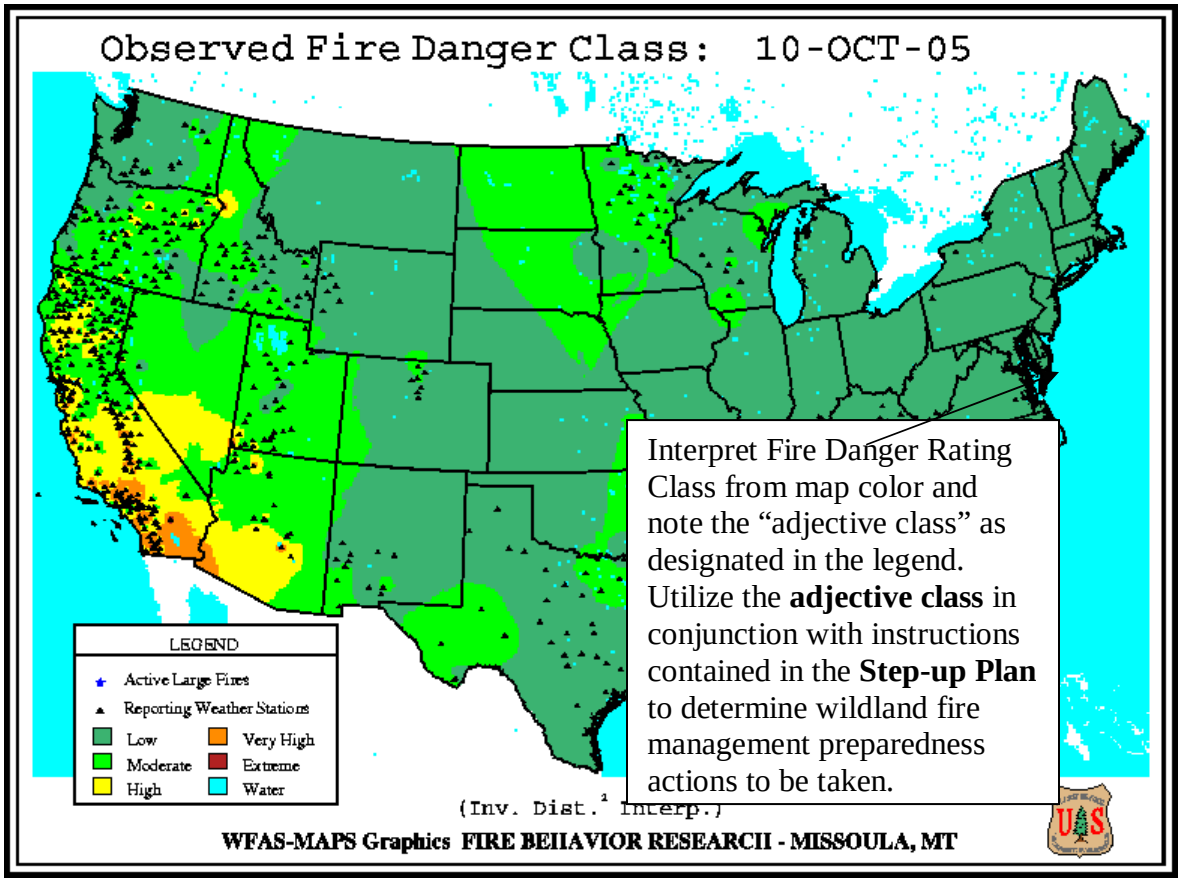
Step 8. Click US48

Step 9. As illustrated in figure 11 on page 73, interpret the National Fire Danger Rating from the colored map and apply the adjective class criteria against the instructions for that adjective class in the seashore wildland fire management Step-up Plan (page 73) in order to determine appropriate staffing levels and actions/ activities.

Step 10. In order to access fire danger ratings predicted for ***tomorrow***,
Under the heading “Current Conditions:

Step 11. Click under “Forecast” US 48. Interpret the chart as with the previous example and compare results with the step-up plan.

Figure 11



e. Step-Up Staffing Plan

The Step-Up Plan for the seashore specifies staffing class levels based upon the National Fire Danger Rating System designation of **Adjective Class**. Preparedness activities during the fire season are based on that system. Fire days are broadly divided into five manning classes according to the intensity of danger factors as indicated by the observed fire danger rating.

The Adjective Class integrates the effects of weather, fuels, topography, and other factors to estimate potential fire behavior, and the corresponding amount of effort required to contain a fire. The staffing classes relate to the expected severity of fire conditions.

Each staffing class level will have a corresponding set of actions that the seashore will initiate to meet potential fire problems. Staffing Class I-III level actions are funded by the seashore, while actions taken at the IV and V staffing class levels are supported with emergency funds. The Seashore Fire Coordinator will obtain these funds from the area FMO (SHEN). During the seashore's two fire seasons (March 15 –November 15 and November 16 –March 14), the seashore's Adjective Class day will be retrieved from the Wildland Fire Assessment System Observed Fire Danger Class Map as discussed in the previous section. The Adjective Class

definitions that determine staffing classes for Assateague Island National Seashore can be found in Appendix F.

Staffing Activity Class (Class Day)

I (LOW) No activity necessary. Normal eight (8) hour tours of duty. If the seashore has any red-carded employees on staff, they will be prepared to respond to reported fires.

Fire Conditions: Fires do not readily start. If an ignition occurs, fires will present a low level of control difficulty. Fires occurring at this level can generally be controlled with existing local forces.

II (MODERATE)

Normal eight (8) hour tours of duty. If the seashore has any red-carded employees on staff, they will be prepared to respond to reported fires.

Fire Conditions: Fires will present a moderate level of control activity. Multiple fires in the same burning period will begin to affect other services. Wind speed will determine severity of fire spread. Fire fuels will be dry. Effectiveness of initial attack forces will be critical. Rapid response time will be important to the potential success of suppression operations.

III (HIGH) Normal eight (8) hour tours of duty. Seashore personnel are prepared to respond to a fire. All relevant personnel know location of red-carded personnel. Red-carded personnel have personal protective equipment immediately available at their work site.

A Step-up to Staffing Class IV should be considered if one or more of the following conditions exist:

- A high visitation period is determined to pose an exceptional human-caused risk of wildland fire.
- Hunting season opens or is in progress outside the seashore (contingent upon local conditions).
- Red Flag Warning is posted by the National Weather Service.
- Eastern Interagency Regional Coordination Center (GACC) or Southern Interagency Regional Coordination Center (SACC) are at Staffing Class IV or V.

Fire Conditions: Fires will present a high level of control difficulty. All of the seashore's red-carded personnel may be involved in control efforts, especially if there is a large fire. Light fuels are very dry. Heavy fuels are nearly dry. Fires will spread rapidly. Multiple fire situations are very possible. Quick response and short control time are critical. Spotting may occur. Mop-up will be more difficult and time-consuming and require considerable personnel to accomplish.

IV (VERY HIGH)

All activities in Staffing Class III are continued. A red-carded firefighter (if available) is on duty during the peak burning period (1000-1800). Lieu days and leave may be cancelled for red-carded firefighters. High Fire Danger notices will be posted at the seashore's Visitor Centers and at site bulletin boards.

If the seashore desires to utilize preparedness activities for wildland fire during the period of very high fire danger, the approval for expenditure of emergency preparedness funds should be first obtained from the area FMO (SHEN).

Fire Conditions: Fires will be extremely difficult to control. Initial attack and reinforcing crews will have difficulty controlling a fire at this level. Only immediate and effective initial attack with the proper resources will allow opportunities for effective control. Light fuels are extremely dry; heavy fuels are dried to a level where they possess the potential to become actively involved in fire spread and growth.

V (EXTREME)

All activities in Staffing Class IV are continued. All fires may be prohibited including the use of fire grates, grills, and stoves. Restrictions and closures at the seashore may be deemed necessary (i.e.; smoking may be limited to paved parking areas only, etc). All interpretive activities will include a fire safety message.

Fire Conditions: Temperatures are high and relative humidity is low. *All* fire fuels are very dry. Fires ignite easily and spread rapidly. Use of aircraft and/ or mechanized equipment may be indicated.

3. Pre-Attack Plan

An employee's key role in making an initial attack work effectively is to provide a timely first contact with appropriate suppression resources regarding fire sightings, and then accurately and efficiently gather the facts concerning the fire that will make the initial attack more effective and SAFE for the responding initial attack resources

.

Here are the steps to follow:

1. If the fire is reported to you by the public, get all of the information that follows **and** a call-back number. Do not assume that the fire the caller is reporting is the same fire that you may already be dealing with. There may be more than one fire going on at the same time!

2. If you see the fire, advise the appropriate responding agency or local personnel immediately and gather the following information;

GET THE FACTS!!

1. Location of the fire

- If a Global Positioning System (GPS) unit is available, a location point(s) should be established.
- If you know how to use a compass, shoot a bearing from a known point and estimate distance to target.
- If you don't know how to use a compass, pinpoint the location by terrain features (i.e.: 300 yards east of Hungerfords).

2. Access to the area

- Road/ Trail name/ number/ location
- Is it accessible by road/ trail/ etc

3. Landowner name (if on private land)

4. Size of the fire (i.e.: about 1 acre). *Tip; try comparing what you see to the size of a football field for comparison purposes.*

5. Speed (i.e. fast and spreading, or slow and creeping)

6. Direction the fire is moving.

7. Values at risk (homes, structures, cultural sites, etc)

8. Immediacy of threat (how much time do we have before the fire gets close to a value at risk?)

9. Cause of the fire (if known).

For more experienced personnel, the following points should be considered when en-route to size-up a fire:

1. Think about your knowledge of the fire area

    - Fuels and terrain (both now and in the direction the fire is moving)
    - Access roads/ trails
    - Barriers to fire spread
    - Land ownership
    - Fire history in the area

2. Fire weather

    - Wind, direction and speed
    - Note: wind direction is indicated by the direction from which the wind is blowing. Example; a North wind is blowing *from* the north.

3. Approach to the area

    - Look for best route in, as well as alternates.
    - If possible, write down license numbers of people driving in or out of the area.

4. Communications

    - Will radios work in this area?
    - Will cell phones operate?

BE SAFE!

FIRE ORDERS

Keep informed on fire weather conditions and forecasts.
Know what your fire is doing at all times.
Base all actions on current and expected behavior of the fire.
Identify escape routes and safety zones, and make them known.
Post lookouts when there is possible danger.
Be alert. Keep calm. Think clearly. Act decisively.
Maintain prompt communications with your forces, your boss, and adjoining forces.
Give clear instructions and be sure they are understood.
Maintain control of your forces at all times.
Fight fire aggressively, having provided for safety first.

WATCH-OUT SITUATIONS

1. Fire not scouted and sized-up.
2. You're in country you have not seen in daylight.
3. Safety zones and escape routes not identified.
4. Unfamiliar with weather and local factors influencing fire behavior.
5. Uninformed on strategy, tactics, and hazards.
6. Instructions and assignments are not clear.
7. No communications link with crew members or supervisor.
8. You are constructing line without a safe anchor point.
9. You are building fireline downhill with fire below.
10. You are attempting a frontal assault on a fire.
11. There is unburned fuel between you and the fire.
12. You cannot see the main fire, and you're not in contact with anyone who can.
13. You're on a hillside where rolling material can ignite fuel below you.
14. Weather is getting hotter and drier.
15. Wind increases or changes direction.
16. You're getting frequent spot fires across the line.
17. Terrain and fuels make escape to safety zones difficult.
18. You feel like taking a nap near the fireline.

Some of the Fire Departments with which ASIS has working agreements have developed their own protocols and procedures for initial attack of fires within the seashore boundary. Based upon eligibility requirements, some of these departments may be eligible to receive funded training and wildland equipment support for rural fire departments through the Department of Interior Rural Fire Assistance Program (RFA) administered by the Area Fire Management Officer at SHEN. An attendant benefit from participation in this program can be closer coordination and communication between ASIS and the volunteer fire departments

that provide it assistance. The SHEN FMO will assist the seashore in determining the eligibility requirements for inclusion in the Rural Fire Assistance Program (RFA).

4. Initial Attack

a. Priority setting during multiple fire occurrences:

During fire suppression operations, when more than one fire is burning in a jurisdiction, the following resources should be consulted:

Vegetative cover map; any fire with continuous fuels up to and across the seashore boundary or structures receives a high priority.

Cultural and historic site map.

Seashore facility map (structures, power lines, waterlines, utilities, etc).

Location of public-use facilities

b. Criteria for appropriate initial attack response consistent with GMP/RMP objectives:

Public and firefighter safety.

Protection of cultural, historic, and natural resources.

Protection of improvements and private property.

Minimum fire-line construction.

Available suppression resources and response times.

Fire danger as determined by fuels, weather, and topography.

Use aircraft and mechanized equipment only where necessary to support above-listed criteria.

Charts to assist in determining the appropriate management response are in Appendix G. These charts consider such factors as fire danger, risk, threats, objectives, and time of season, external influences, and complexity.

c. Confinement as a Strategy:

Confinement may be used to minimize resource damage and to provide for firefighter safety.

A confinement strategy may be selected for initial attack as long as it is not being used solely to meet resource management objectives.

Resource benefits may be a by-product of any strategy, but the strategy *must* be based upon the criteria listed above.

A confinement strategy may also be selected in the Wildland Fire Situation Analysis (WFSA) process when initial attack has failed to contain a wildland fire.

d. Response Times:

Response Time for initial attack ground resources is approximately thirty minutes or more depending on proximity, accessibility, and other variables. Extended attack resources should be able to respond in one to three hours depending on proximity and availability. Aviation resources will have the greatest range of response time. This time can vary from two hours to an indefinite period of time depending on seasonality, regional severity, fire priorities, availability, and proximity. An air tanker is stationed in Knoxville, Tennessee during the fire season. The Weyer's Cave Air Tanker Base in Shenandoah Valley also pre-stages retardant aircraft during periods of high fire danger. These resources should be ordered through the EICC at Shenandoah National Park. The EICC is staffed 365 days a year, though not always for 24 hours. Contact telephone numbers can be found in Appendix O.

e. Restrictions and Special Concerns:

The constraints on these strategies guide the management of suppression efforts and prescribed fire operations. These constraints include:

- Under no circumstances, *except imminent loss of life or of valuable property*, will cultural resources be damaged or altered by fire suppression activity.

- Archaeological resources must be protected. Each site and situation will be evaluated on a case-by-case basis and must be monitored at all times. Generally, the use of heavy mechanized equipment such as tractor plows and bulldozers, the construction of fireline, ditching or other earthwork activities will not take place over known sites *unless exigent circumstances are present*.

- The only mechanized equipment allowed during suppression operations, *unless otherwise authorized* by the Superintendent, will be chainsaws, portable and mobile pumps, backpack blowers, fire engines, aircraft, and devices used for heat or fire detection.

- No fire retardant will be used without the consent of the Superintendent.

- No new roads will be created.

- Dead or live standing trees will not be cut unless firefighter, public safety, or suppression actions are compromised.

- Operating vehicles off existing roads will be done in consideration of soil conditions. Operation of tracked vehicles or use of rubber-wheeled vehicles during wet soil conditions will not be allowed.

- Human-caused fires require an investigation and report by law enforcement personnel.

- In the event of the threat of life or the potential for extensive property damage, the Superintendent may amend any of these constraints (see Delegation of Authority).

- Some areas of the seashore have been afforded special designations as a means to protect sensitive watersheds from the deleterious effects of wildland fire and fire suppression operations. Depending upon the designation, buffer zones have been established that provide protection from unwanted impacts. These are:

    1. Resource Protection Area (RPA)

       The RPA includes all tidal wetlands; non-tidal wetlands connected by surface flow and contiguous to tidal wetlands and water bodies with perennial flow and shorelines. A ***100 foot vegetation buffer*** around each such feature and around all water bodies with perennial flow delineates the RPA. This buffer area is designed to retard runoff, prevent erosion and filter non-point source pollutants from runoff. The buffer area is also designed to achieve a level of 75% reduction in sediments and 40% reduction in nutrients.

f. Local Issues:

The Assateague Island National Seashore has very limited initial attack suppression resources. Personnel that have the requisite training and experience may or may not be available for duty at any given time. The demands of day-to-day seashore operations, when combined with training, vacation, lieu days, details, lack of trained personnel, etc, often leaves ASIS with just a few qualified firefighting staff.

Because the seashore has limited resources to commit to wildland fire suppression, it must depend upon local Fire Departments, the Maryland Department of Natural Resources, Bureau of Forestry, the Commonwealth of Virginia, Virginia Department of Forestry and U.S. Fish and Wildlife Service for initial and extended attack suppression operations in many situations. This close alliance requires that the seashore work

closely with these agencies in planning, training, preparedness, and other fire management issues.

Suppression qualification standards of cooperator's fire personnel will be accepted at that organization's standards while under that entity's supervision during initial attack (first 24 hours). Cooperators must meet NWCG standards while under NPS supervision when fires move into an extended attack mode (24 hours+). The closest additional forces dispatch concept will be utilized whenever any particular wildfire escapes initial attack and threatens to exceed the seashore's capability to control. .

g. Suppression Equipment:

The recommended equipment for fire suppression at ASIS includes: all necessary personal protective equipment, fire engines (or slip-on pumpers), fire-fighting foam, back-pack pumps (bladder bags), fire rakes (council tools), leaf blowers, flappers, portable pumps, hose lays, chain saws, shovels, Pulaski's, drip torches and fusees. With the exception of hand tools and limited power equipment (i.e. power saws, portable pumps), cooperators will be expected to supply their own equipment during initial attack operations.

5. Extended Attack and Large Fire Suppression

a. Extended Attack Needs:

Extended attack needs will be determined by considering the following:

- Threats to life, property, and seashore resources.
- Availability of suppression forces.
- Current and expected fire behavior.

b. Implementation Plan Requirements – Wildland Fire Situation Analysis (WFSA) Development:

When a fire escapes initial attack, a new strategy must be developed to suppress the fire. This selection process is accomplished through the development of a Wildland Fire Situation Analysis (WFSA).

The WFSA is a decision process that employs a systematic and reasonable approach to determine the most appropriate management strategy for a particular situation. Reasonable management alternatives are identified, analyzed, and evaluated. They are consistent with the expected probability of success /consequences of failure. The Superintendent shall approve the WFSA and any revisions. Evaluation criteria include firefighter safety, anticipated costs, resource impacts, and social, political, and

environmental considerations. The evaluation of alternatives becomes the triggering mechanism for re-evaluation of the WFSA.

A written copy of a WFSA can be found in Appendix H. An electronic version can be found at the U. S. Forest Service website at http://www.fs.fed.us/fire/wfsa/.

c. Incident Management Transition:

Transition to an incident management team entails a briefing by the Superintendent (or his/ her designated representative) and a limited delegation of authority for the suppression of the fire(s). The briefing should address agency specific concerns, priorities, firefighter and public safety, economic and resource concerns, and other topics or issues of importance and relevance to the suppression effort.

d. Delegation of Authority:

A Delegation of Authority from the Superintendent to the Incident Commander is located in Appendix I.

NOTE: This document *may* be modified to meet changing management objectives for a particular incident.

6. Exceeding WIFIP and New Strategy Selection

A Wildland Fire Implementation Plan is a progressively developed assessment and operational management plan that documents the analysis and selection of strategies, and describes the appropriate management response for a wildland fire being managed for resource benefits. An example can be found in Appendix E.

A WFIP has been exceeded when a fire cannot be suppressed during initial attack suppression actions, or when a prescribed fire becomes an escaped fire. In this case, a Wildland Fire Situation Analysis must be developed. When completed, the WFSA will identify a new strategy by which the fire should be managed.

7. Minimum Impact Suppression Tactics

- All fire management activities at the seashore will rely on tactics that minimize resource damage while maintaining the safety of firefighters, personnel, and the public as the highest priority.

- Superintendent approval is needed for off road use of vehicles, bulldozers, and mechanized equipment.

- Complete minimum impact guidelines are listed in Appendix J.

8. Rehabilitation Guidelines

When a suppression action is taken, rehabilitation may be necessary. On January 19, 2001, the Department of the Interior issued new policies on burned area emergency stabilization and rehabilitation. The specifics of the policy can be found in 620 DM 3 DOI BAER Policy (2001). The most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression tactics.

The Incident Commander and the Natural Resource Professional will initiate rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential damage and hazards caused by the fire:

These actions may include:

- Backfilling of control lines, scarification, and seeding with native species or other desirable species.
- Installation of water bars and construction of drain dips on control lines to prevent erosion.
- Installation of check dams to reduce erosion potential in drainages.
- Flush cutting of stumps and camouflaging with soil and moss.
- The placement of cut vegetative materials in random positions.
- Positioning felled and bucked material so as to be least noticeable to visitors and camouflage where possible.
- Restoration of natural ground contours.
- Removal of all flagging, equipment, and litter.
- Complete restoration of camping areas and improved helispots.
- Consideration and planning for more extensive rehabilitation or re-vegetation to restore sensitive impacted areas.

The Seashore Fire Coordinator and a Natural Resource Professional, subject to review by the Seashore Fire Committee, will jointly formulate rehabilitation plans for each fire. Rehabilitation efforts should be initiated as soon as they can be safely implemented, which may be before the fire is declared controlled.

Rehabilitation work resulting from suppression actions will be charged to the corresponding suppression account. Rehabilitation work needed to rehabilitate the

effects of the fire will be described in the BAER plan, and will be submitted to the Regional BAER Coordinator (Regional Prescribed Fire Specialist) for approval within one week of the date the fire is declared controlled. BAER project requests totaling $300,000 or less can be approved by the Regional BAER Coordinator. Submissions over this amount are reviewed at the regional level and forwarded to the Fire Management Program Center in Boise through the Area and Regional FMO's for approval.

9. Records and Reports

The Seashore Fire Coordinator is responsible for all fire related records and reports except the WFIP. This responsibility may be delegated to an incoming Incident Commander for any fire escaping initial attack.

Fires

All fires will be sequentially assigned a fire number by calendar year. The Incident Commander will fill out a DI-1202 (Individual Fire Report) after the fire is declared out. A copy of this report may be found in Appendix R. The Seashore Fire Coordinator, or a designated member of the seashore staff, will review all DI-1202's for accuracy and completeness before a copy is mailed to the Fire Program Assistant at the Area Fire Management Office located at Shenandoah National Park. The original will be kept in the seashore files.

An Individual Fire Report form will be filed by fire number with each year having a separate folder. A complete report will include the following attachments if applicable:

- Any written policies, guidelines, or authority statements signed by the Superintendent.
- Copies of equipment purchase or personnel request orders.
- All situation maps.
- Personnel lists (including Individual Fire Fighter Time Reports (OF 288).
- Approved Burn Plan (if prescribed burn).
- Fire Monitor's Report/ Fire Behavior Analyst Report/Post Burn Evaluation.
- Press clippings.
- Accident reports.
- All weather data reports and records.

- Burning permits and air quality clearances for prescribed burns.
- Documentation of all financial charges made against the assigned fire account number.
- Rehabilitation Plan.

Daily Situation Report

All wildland fires will be closely monitored. The following information will be relayed to the Area Fire Management Officer at Shenandoah by 9:30 a.m. daily for entry into the nationwide fire summary report. The Seashore Fire Coordinator (or his/ her designee) will be responsible for contacting the Area FMO.

- Fire name and start date (only for the first day).
- Present fire behavior.
- Estimate of acreage burned in last 24 hours.
- Direction of spread.
- Rate of Spread.
- Type of fuels on ground.
- Wind speed, temperature and relative humidity on-site readings.
- Number of personnel and equipment committed to the fire.
- Resources threatened and whether or not actions need to be re-evaluated.
- Document all cultural resources encountered, affected visibility, archeological or cultural landscape features.
- Estimated control date.
- Judgment of the ability of local forces to control the fire.
- ***Anytime*** *the seashore moves into Staffing Class IV and V.*

Individual Training and Experience

Every employee who has had training or fire experience in the past year will complete these forms. This will be done once a year after the completion of the fire season. The Seashore Fire Coordinator will keep the originals and send copies to the Area Fire

Management Officer for entry into the service wide computer database. Those employees who are not in the computer but wish to participate in the fire program will fill out the initial Employee Master Record Update Form. A copy of this form may be obtained from the Area FMO at SHEN.

C. Wildland Fire Use

This option was rejected due to the small size of the seashore and the lack of available qualified personnel that are required to plan and implement these types of fire management operations.

D. Prescribed Fire

1. Planning and Documentation

a. Annual Activities for Preparation and Implementation of Program

Within the parameters defined in the seashore's 5-year fuels treatment plan, the Seashore Fire Management Committee will annually meet to consider proposed fire management projects for the year. The 5-year plan can be found in Appendix K. This plan represents a *suggested* approach to meet seashore management goals through the use of prescribed fire and non-fire fuel reduction. It is by its very nature an ambitious plan that may be difficult to implement unless maximum environmental and management criteria are in alignment. It has been designed so that seashore staff and the Area Fire Management Officer will have the option to "fine-tune" this general overview plan and develop site specific plans and objectives as time progresses. An Environmental Assessment (EA) based upon the FMP (and the 5-year plan) has been submitted and approved at the regional level; any modifications in its structure could require the development of an updated EA.This plan will serve as a starting point for those endeavors. An assessment of the approved plans will identify needed resources, individual responsibilities, and timelines. These activities include identifying areas of treatment, the preparation of burn plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

b. Long-Term Prescribed Fire Strategy

Prescribed fire will be used as a management tool to protect, preserve and enhance cultural and natural resources, manage vegetation, and reduce hazardous fuel loading. The fuels management program complements the fire management program by reducing fire hazards, decreasing the potential damage to seashore resources and outside lands, and minimizing risks to employees, residents, and visitors. Prescribed fire objectives are:

1. Reduce hazardous fuel accumulations around developed areas, along the seashore boundary, and/or adjacent to other jurisdictions.

2. Reduce hazardous fuel accumulations in those locations where sensitive cultural and natural resources might be placed at risk by their presence.

2. Assist with the establishment and maintenance of desired cultural scenes.

3. Manage vegetation to maintain vistas, promote the growth of native vegetation (such as native grasses and herbaceous species), and control woody and/ or invasive vegetation.

4. Restore healthy forest/ meadow/ marsh ecosystem processes.

c. Personnel Requirements

Because of its relatively small size, the seashore does not have the staff to adequately plan and implement a prescribed fire program on its own. However, in concert with other park and cooperating agency personnel, the ability to effectively implement a quality prescribed fire program is within the grasp of seashore management. Personnel needed to plan and implement a prescribed burn will be identified in a project-specific burn plan; one that is prepared for each and every planned use of prescribed fire. Personnel needed to implement the plan will be drawn from a variety of resources, including employees of the National Park Service's Mountains-to-the-Sea Fire Management Group of parks. These parks, along with ASIS, represent a coordinated approach aimed at providing the expertise and personnel necessary to manage mutual prescribed fire programs within the states of Virginia and Maryland. The Mountains-to-the-Sea Group is composed of the following National Park Service units; Appomattox Court House National Historical Park, Assateague Island NS, Booker T. Washington National Monument, Fredericksburg & Spotsylvania NMP, George Washington Birthplace NM, Hampton NHS, Petersburg National Military Park, Richmond NBP, Thomas Stone NHS, and Shenandoah NP. *The Area Fire Management Officer located at Shenandoah National Park will provide the overall assistance and coordination necessary to make the Mountains-to-the-Sea Group function in a cohesive fashion.* Employees of the U.S. Fish and Wildlife Service, Maryland Department of Natural Resources, Bureau of Forestry, Virginia Department of Forestry, Virginia Department of Conservation and Recreation and the Nature Conservancy, as well as local Fire Departments with which ASIS has working agreements, may also be utilized in planning and conducting prescribed burning operations.

d. Fire Weather, Effects, and Behavior Monitoring

Monitoring of prescribed fires at the seashore is intended to provide information for quantifying and predicting fire behavior as well as for measuring resultant ecological effects on seashore resources. It is also a means by which to build a historical record of vegetative change. Monitoring measures the parameters common to all fires: fuels, topography, weather, and fire behavior. In addition, ecological changes such as species composition and structural changes will be monitored for several years after a fire. This information will be very useful in adjusting the prescribed fire program to better meet short and long-term resource objectives.

During prescribed burning operations, monitoring will take place that includes mapping, weather, site and fuel measurements, and direct observation of fire characteristics such as flame length, rate of spread, and fire intensity. Operational monitoring provides a check to ensure that the fire remains in prescription, and serves as a basis for evaluation and comparison of management actions in response to measured, changing fire conditions, and changes such as fuel conditions and species composition.

The Area Fire Management Officer at SHEN has a portable Remote Automated Weather Station (RAWS) that monitors and records on-site weather and fuels data 24/7, transmitting the data via the GOES satellite to the base station. The equipment is normally set-up at the site of a proposed prescribed burn site approximately 1-2 weeks before the date of ignition. This equipment is available to ASIS upon request.

All prescribed fires will be monitored regardless of size. The Seashore Fire Coordinator will establish specific fire information guidelines for each fire to update intelligence about that particular fire.

The Seashore Fire Coordinator will assure that assigned qualified personnel are used to monitor prescribed fires. When possible, the most efficient utilization of personnel for fires of *low complexity* is to utilize red-carded individuals with multiple qualifications (i.e. ignition, holding, and monitoring) in fire suppression operations *and* monitoring. A more efficient and flexible monitoring program will likely result from the use of highly qualified personnel to both suppress the fire and perform other monitoring tasks such as completing assessments of the fires potential, characterizing and quantifying fire effects, and determining if a fire is within applicable prescription parameters.

The seashore will use the fire monitoring protocols with adaptations described in NPS Fire Monitoring Handbook. Fire monitoring support will be coordinated with the Area Fire Ecologist who is co-located with the Area FMO at SHEN. A staff of trained fire monitors is available to the parks in the Mountains-to-the Sea Group (including ASIS). Their responsibility is to coordinate the fire monitoring functions

necessary before, during, and after the completion of a prescribed fire. They are available to parks for on-site monitoring applications.

e. Prescribed Fire Project Critique

The Seashore Fire Management Committee will critique each prescribed fire. A report detailing the actual burn will accompany any recommendations or changes deemed necessary in the program. This report will be submitted to the Superintendent. A post-season critique of the fire management program, including the prescribed fire program, will be held each year by the Seashore Fire Management Committee at an appropriate time after the conclusion of the fall fire season.

f. Reporting and Documentation Requirements

All prescribed fire forms will be completed as outlined by the Prescribed Burn Boss. A fire monitor will be assigned to collect all predetermined information, and complete all necessary forms prior to, during, and after the fire. All records will be archived in seashore fire records for future use and reference.

The Prescribed Fire Burn Boss will prepare a final report on the prescribed fire for the review of those staff members that have oversight and responsibility for natural and cultural resources. This may be a Division Chief or other staff person designated by the Superintendent (or the Superintendent him/ herself) to perform those functions. Information will include a narrative of the fire operation, a determination of whether objectives were met, description of any resources adversely affected and why, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn.

The forms necessary for documenting prescribed fire activities are outlined in RM-18 (Wildland Fire Management). The completion of the Individual Fire Report, DI-1202, is the responsibility of the Prescribed Fire Burn Boss. All costs associated with the burn, including personnel and equipment costs, should be included as a portion of the final fire report.

g. Historic Fuel Treatment Map

An historic fuels treatment map can be found in Appendix L of this plan. This map provides an historic baseline map for fuels treatment activities conducted at the seashore.

h. Prescribed Burn Plan Requirements

A standard prescribed fire burn plan template has been developed for use by the National Park Service. However, due to the variety of information required

by an individual park unit, the plan may be supplemented with additional content provided the minimum elements listed in the standard form are addressed. Each plan **shall include** as a minimum the following elements:

1. Signature Page: The approved prescribed burn plan constitutes a delegation of authority to burn. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan.

2. Executive Summary: A brief discussion describing the purpose and justification of the project, connection with the overall management of the unit, and description of how it implements the fire management plan.

3. Description of Prescribed Fire Area:

   -General area description (narrative)
   -Location Lat/ long or UTM
   -Geographic Attributes (Project size, elevation range, slope range, aspect range)

4. Description of project boundaries (define the geographic, natural and human features to be used as project boundaries)

5. Vegetation Types: Describe the structure and composition of the vegetation type(s) within the project area, the percent of the area composed of this vegetation type, and the fuel model that corresponds to it.)

6. Fuels Characteristics: Describe fuel loads as applicable by fuel type. In addition, fuel loadings by size class, live and dead percentage, fuel bed depth, arrangement, and discussion of past environmental effects on the land and how they impact the fuel characteristics should all be included as a part of this section.

7. Vicinity Maps

8. Project Maps (values at risk, fuels, burn units, firing and ignition, etc)

9. Risk Management: The process of identifying and controlling hazards to protect resources and property. This process should include an analysis of proposed actions, the environment (fuels, weather, and topography) assessment of hazards, potential consequences, and mitigation to reduce risk. A Job Hazard Analysis should be completed as a part of this process. A copy is located in RM-18.

10. Project Complexity: A prescribed fire complexity rating (Fire Complexity Rating Worksheet and Complexity Value Guide) will be completed as a part of each prescribed fire plan following the process outlined in RM-18. This process determines the level of organizational structure and support needed to implement the project based upon operational, logistical, safety, and management needs. The complexity value breakpoints for requiring a Prescribed Fire Burn Boss Type I shall be four or more Complexity Values rated "High" OR when deemed appropriate by the agency administrator or the unit Fire Management Officer.

11. Organization: A listing of all organizational personnel necessary to complete all phases of the project. This will be based upon the objectives to be achieved, risk assessment and project complexity. The organization must specify the **minimum** number and type of resources needed. Due consideration must be taken regarding the length of the project, the number of operational periods needed to implement all phases of the operation, and when and how exchange of personnel and resources will occur.

12. Cost: Estimated total costs for all phases of the project.

13. Scheduling: Included should be the proposed ignition date, projected duration, etc.

14. Pre-burn Considerations: A listing of key on and offsite pre-burn activities and special precautions and regulations, including responsibilities and timeframes, should be included. Specify on-site: line to be built, snags to be felled or protected, equipment to be pre-positioned, special features to be protected (i.e. RMA's, cultural sites, etc), warning signs to be placed, weather recording and monitoring needs, etc. Specify off-site: burn permits, notifications, media releases, closures, etc. Notifications should show who the contacts are to be made with and who is to make them and when. Specify special precautions and regulations: air quality, endangered and threatened species, cultural compliance clearances, utilities, etc.

15. Prescription: A prescribed fire prescription contains key weather and fire behavior parameters needed to achieve desired results. Identify ranges of acceptable prescription parameters to obtain desired fire behavior and effects. Modeling outputs should be attached to justify the prescription(s) discussed in the planning documents.

16. Ignition and Holding Actions: Identify the methods, roles and responsibilities, coordination and special considerations needed. Attach modeling outputs or worksheets to justify minimum holding resources required. An Incident Action Plan (IAP) should be developed for each

operational period that defines tactical activities and assignments in a detailed manner.

-Test Fire: A test fire is completed prior to making the decision to implement the project. It should be ignited at the location within the prescribed burn area that is representative of the site as a whole and that can be easily controlled if fire behavior is unacceptable. This process is designed to validate/ evaluate fire behavior characteristics that are necessary to meet the prescribed fire plan objectives.

-Firing and Ignition: A thorough description of ignition operations including firing techniques to be used, including patterns and locations and timing of ignition(s). (Attach a map where applicable). Firing and ignition patterns should address potential changes in weather, topography, and fuels. Specific firing and ignition tactics will be documented in the IAP showing the necessary resources, safety considerations, equipment and supplies. These tactics should be further clarified in the Incident Briefing that takes place before the implementation of the project.

-Holding Actions: Operations to safely maintain the prescribed fire within prescription, within project boundaries, and control all slopovers and spot fires within a predetermined time and size.

-Critical Holding Areas: Identify those areas where there is a higher likelihood of holding problems along the boundary or outside of the burn unit. A careful consideration of such areas as locations where spot fires and/ or slopovers are most likely to occur, changes in fuel type, high resource value areas, etc, is essential.

-Project Delineation: The project area should be divided into appropriate sub-units (i.e. Divisions, branches, etc) based upon the size, complexity, assignments, access, topography, etc of the unit. These areas should be clearly delineated on a map and placed into the Incident Action Plan (IAP).

-Mop-up Operations: Proposed actions needed to secure and patrol the project area until the prescribed fire is declared out.

17. Wildland Fire Transition Plan: Identify actions and notifications needed in the event that a prescribed fire exceeds project boundaries and cannot be controlled within one burning period using on-site holding resources. All further actions will be determined through a new strategy developed in the Wildland Fire Situation Analysis (WFSA) process. Identify who the Incident Commander will be and what notifications will be needed.

18. Protection of Sensitive Features: Identify treatment and mitigations needed to protect cultural sites, threatened and endangered species, or other sensitive features (see 14 above). Include compliance with all applicable NEPA and NHPA requirements. Consult the Environmental Assessment prepared for the unit Fire Management Plan to ensure that coverage is current and applicable.

19. Public and Firefighter Safety: Describe public and firefighter safety hazards in and outside of the project area, measures taken to reduce and/ or mitigate those hazards, and Emergency Medical Service personnel assigned to the project. The IAP should address communications, a medical plan, and an incident safety analysis.

20. Smoke Management: Describe how the project will comply with local, county, state, and federal air quality regulations. Include any modeling outputs and maps detailing predicted smoke dispersion and smoke related safety and health issues. Attach a copy of the smoke parameters from the National Weather Service relating to smoke dispersion and weather indices. An important inclusion is a copy of a smoke dispersion vector map showing potential sensitive targets downrange in the projected direction of travel of the main smoke column.

21. Interagency Coordination and Public Information: Identify actions, timelines and responsibilities for interagency and intra-agency pre-burn coordination and public involvement. This should include information regarding media releases, public notice postings, etc. Included should be a list of appropriate contact officials from among the public, cooperating agencies, and individuals.

22. Monitoring: Describe how the following elements will be met:

-Fire Behavior Monitoring: Refer to the guidelines for monitoring found in the National Park Service Fire Monitoring Handbook. The standards for Level 1 and Level 2 fire monitoring should be adhered to. These should address, as a minimum, the following procedures: specify how the monitoring of prescription elements will take place pre-ignition and during the burn, including weather, smoke/ air quality, and fire behavior observations. Specify on-site weather, smoke, and fire behavior observations required during all phases of the project. Include procedures and responsibilities for acquiring weather and smoke forecasts.

-Fire Effects Monitoring: Refer to the guidelines for monitoring found in the National Park Service Fire Monitoring Handbook. The standards for Level 3 and/ or Level 4 fire monitoring should be adhered to. These should include, as a minimum, the following procedures: Specify how long and short-term fire effects (vegetation and fuels) monitoring will take place pre-burn and

post-burn in order to evaluate whether or not project objectives were met. If plots have been established prior to the project's implementation, a map of those plot locations should be included. In addition, Chapter 11 of RM-18 includes an outline that may be used for completing a Fire Monitoring Plan.

23. Post Fire Rehabilitation: Describe any necessary rehabilitation of disturbances that will need to be undertaken as a result of *fire management activities.* These typically include fireline restoration, minor fence repairs, and other mitigation actions that have been pre-identified in the prescribed burn plan.

24. Post Fire Reports: Identify who will need to prepare reports at the conclusion of the prescribed burn project. Indicate what these reports entail and where they are to be submitted.

25. Appendices: Items to be attached to the prescribed burn plan:

-Reviewer Comments: Each reviewer comments on plan.
-Technical Reviewer: Checklist and comments.
-Maps
-Prescribed Fire Complexity Worksheet
-Fire Modeling Outputs
-Agency Administrator Go/ No-Go Pre-ignition Approval Checklist
-Prescribed Fire Operations Go/ No-Go Checklist

Parameters for debris burning are:

- Temperature: Less than or equal to normal average high temperature for the month.
- Wind Speed: Less than 10 mph (measured at eye level).
- Relative Humidity: Greater than 40%.
- Fine Fuel Moisture: Surrounding fuels greater than 10%.
- Smoke Dispersal: Mixing heights equal to or greater than 500 meters.

2. Exceeding Prescribed Burn Plan

In the event a prescribed fire escapes from within the burn unit boundary and immediate efforts at control are unsuccessful, the prescribed fire will be declared a wildfire and immediately suppressed. A Wildland Fire Situation Analysis (WFSA) will be completed and additional personnel and resources ordered as determined by the Incident Commander. If the fire continues to burn out of control, additional resources

should be summoned from nearby resources. An incident management team or other non-local resources may be requested to assume command of the fire.

3. Air Quality and Smoke Management

a. Air Quality Issues:

The seashore is located in a Class II air quality area. The Fire Management Plan will be in compliance with the Clean Air Act and both Maryland and Virginia Emission Standards for Open Burning. Prescribed fires will not be scheduled during those times of the year when air regulations prohibit the use of prescribed fires. A copy of the states of Maryland and Virginia Emission Standards for Open Burning are located in Appendix M.

The objectives for smoke management and compliance with the Clean Air Act are similar to those for fire management: to encourage a natural process so long as it does not endanger public health and safety. Smoke levels become unacceptable when it impairs visibility to such a degree that it detracts from visitor enjoyment of primary seashore resources. As a result, dense smoke within the seashore is generally deemed unacceptable. However, it may be tolerated for short periods if the winds assure good mixing and adequate dispersal. The seashore will also evaluate the forecasted impact of smoke on local communities and visitor safety. All of these considerations are difficult to quantify, monitor, and evaluate. As a result, there exists considerable room for discretionary judgment in making management decisions related to smoke and its impacts on the surrounding environment.

It may be necessary to aggressively control fires when smoke affects a sensitive area, or creates a significant public response. All fire activities may have to be curtailed when an extended inversion or air pollution episode is in effect. Traffic control measures will be undertaken in conjunction with local law enforcement agencies when such episodes occur. Complaints regarding smoke should be documented and communicated to the Superintendent.

b. Smoke Mitigation:

Assateague Island National Seashore will adhere to all applicable smoke management regulations in *both* of the state jurisdictions in which it operates (Maryland Fire Management Unit and Virginia Fire Management Unit).

In the Maryland FMU, **Annotated Code of Maryland, Title 26, Department of the Environment, Subtitle 11 Air Quality, Chapter 7 Open Fires** is the administrative document that provides direction for implementation of prescribed burning and smoke management (Appendix M).

In the Virginia FMU, the seashore must comply with Virginia's Smoke Management Planning Guidelines. Specific requirements can be found in the **"Operational Guidance for the Smoke Management Program, Directive 1-4-601"** (Appendix M)**.**

Coordination with applicable state and local agencies regarding smoke management will begin during the time period that the prescribed fire is in the planning process. Although the documents described in the preceding paragraph provide general guidance regarding visible emissions, ASIS should make personal contact with local and state agencies to ensure the planning process regarding prescribed burns is in full concurrence with applicable regulations. In addition, ASIS should notify the Maryland DNR or Virginia Department of Forestry (VDOF), as well as assisting agencies adjacent to the seashore, at the time of *any* fire ignition. In addition, the Seashore Fire Coordinator will contact the National Weather Service Office (NWS), Wakefield VA, to verify the smoke management forecast. Thereafter, smoke characteristics will be evaluated daily along with the NWS smoke management forecast during prescribed fires. Upon request, the Seashore Fire Coordinator should be prepared to provide, to the appropriate state agency (Maryland or Virginia), relevant field data for all prescribed fires. Copies of the NPS prescribed burn plan and monitoring data should suffice for this purpose.

The visibility provisions of applicable State Implementation Plans are intended to protect areas from human-induced visibility degradation. Air Quality Boards generally require that monitoring be done as prescribed fires can potentially affect visibility. Prescribed fires will be closely monitored for spread, location, and size to determine visibility impact conditions. Air quality and visibility monitoring data should be made available for analysis annually. The seashore will coordinate fire specific visibility monitoring.

To minimize the effects of smoke the following guidelines regarding visible emissions will be considered when planning a prescribed fire:

- A detailed smoke vector map will be included in every prescribed fire plan to identify sensitive areas and expected directional flow of smoke.

- Burning will be conducted only when: visibility exceeds 5 miles or when the fire weather forecast indicates the presence of an unstable air mass, afternoon mixing heights are 500 meters or greater, and ventilation rates (mixing height in meters x transport wind speed in meters per second) is 2000 or greater.

- Prescribed fires will *not* be ignited during those time periods when state or local regulatory agencies have issued air pollution health advisories, alerts, warnings or emergencies, or during large scale temperature inversion events. The use of local law enforcement and applicable state

departments of transportation to mitigate traffic hazards from smoke should be considered as an active part of the planning and operational process for any prescribed fire.

- Burning will be conducted only when the 20-foot wind speed *exceeds* 5 mph and the direction of the wind vector is away from sensitive areas.
- Backing and flanking fires will be used when possible to minimize particulate emissions.
- Stumps, snags, and other hot spots will be mopped-up to reduce residual smoke.
- A *fire weather forecast* should be obtained for the appropriate zone from the National Weather Service, Wakefield, VA, prior to ignition of the prescribed fire. (See information on page 70 under “weather station” for instructions on how to access this information).
- Appropriate news media and other public affairs offices will be kept informed of fire and smoke dispersal conditions throughout the duration of the project.
- The seashore will coordinate traffic control activities as needed. This will involve close coordination with the local law enforcement and police agencies that will most likely be used to mitigate traffic hazards from smoke.

A Guide to Wildland Fuels Smoke Management, published by the Virginia Department of Forestry, should be used as a reference for the planning and implementation of all of the activities outlined above. This document is used by a large number of state and federal agencies as a general guide for wildland fuels management.

E. Non-Fire Fuels Treatment Applications

1. Non Fire treatments and Other Applications

a. Annual Activities

The Seashore Fire Management Committee will annually meet to consider proposed non-fire, prescribed, and/or chemical fuels treatment projects for the year. An assessment of the approved project plans will identify needed resources, individual responsibilities, and timelines. These activities may include: the writing of project plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits (if required).

b. Equipment and Seasonal Restrictions

The same set of restrictions that applied to both prescribed and suppression fires will be utilized with non-fire hazardous fuel reduction activities. Off road vehicle or equipment use is prohibited unless the Superintendent determines that there is little or no risk to natural and/ or cultural resources. This determination may be weather dependent and could vary depending upon the time of the year.

c. Required Monitoring

NOTE: A fully qualified and operational fire monitoring staff is available to develop and implement this and other monitoring activities associated with the seashore's wildland fire management plan. The Area FMO and Fire Ecologist will assist in establishing this portion of the program for ASIS.

Monitoring of prescribed fires at ASIS is intended to provide information for quantifying and predicting fire behavior and its ecological effects on seashore resources, while building a historical record. Monitoring measures the parameters common to all fires: fuels, topography, weather, and fire behavior. In addition, ecological changes such as species composition and structural changes will be monitored for several years after a fire.

All management-ignited fires will be monitored regardless of size. The Seashore Fire Coordinator will establish specific fire information guidelines for each fire to update intelligence about the fire.

ASIS will use the fire monitoring protocols found in the NPS Fire Monitoring Handbook (FMH) and adapted for use at the seashore. A specific Fire Effects Monitoring Plan will be developed once the prescribed fire program becomes fully operational.

Prior to ignition of a burn unit, monitoring plots should be installed. These plots should be read before and after the burn to gather pre and post-burn data. As a minimum, at least one of the approved processes for determining dead and downed fuels should be utilized in order to gather data related to those criteria. In addition, photo points should be established in the unit.

d. Critique Format

The project supervisor, be it prescribed fire, non-fire fuel reduction, etc, will meet with the Seashore Fire Coordinator and the selected Natural and Cultural Resources Professional(s) to critique the proposed project. Accomplishment of objectives, methodology, cost effectiveness, safety issues, and resource damage are some of the topics to be discussed. A written project completion report incorporating the findings of the critique will be forwarded to the Superintendent and the Regional Fire Management Office through the Area FMO at SHEN.

e. Cost Accounting

Individual project costs will be tracked by the seashore and the Area Fire Management Office at Shenandoah National Park. They will be submitted to the Regional Fire Management Office for review. Expenditures will not exceed the authorized project amount.

f. Reporting and Documentation

All project forms will be completed as outlined by the Prescribed Fire Burn Boss. A fire monitor will be assigned to collect all predetermined information, and complete all necessary forms prior to, during, and after the fire. All records will be archived in the seashore's fire records and the Area Fire Management Office at Shenandoah for future use and reference.

The Prescribed Fire Burn Boss will prepare a final report on the prescribed fire for the Natural and Cultural Resources Professional. Information will include a narrative of the fire operation, a determination of whether objectives were met, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn.

The forms necessary for documenting prescribed fire activities are outlined in NPS-Directors Orders #18 and Reference Manual #18. The Individual Fire Report, DI-1202, is the responsibility of the Seashore Fire Coordinator.

g. Annual Planned Project List

Any division chief may submit proposed projects to the Seashore Fire Coordinator. The Seashore Fire Coordinator will compile a list of these projects and submit them to the Seashore Fire Management Committee for discussion, approval and prioritization.

F. Emergency Rehabilitation and Restoration

On January 19, 2001, the Department of the Interior issued new policy on burned area emergency stabilization and rehabilitation. The specifics of the policy can be found in 620 DM 3 DOI BAER Policy (2001). The Seashore Fire Coordinator and/ or the Natural Resource Specialist, subject to review by the Seashore Fire Committee, will jointly formulate a rehabilitation plan for each fire. As a practical matter, this will not require a BAER submission for the greatest majority of fires, but does provide a framework from which to work in those cases where extensive rehabilitation efforts are needed.

The BAER plan will be submitted to the Region BAER Coordinator (Prescribed Fire Specialist) for approval within one week of the date the fire is declared controlled. BAER project requests totaling $300,000 or less can be approved by the Regional BAER

Coordinator (Doug Wallner). Submissions over this amount are reviewed at the regional level and forwarded to the Fire Management Program Center for approval.

V. ORGANIZATIONAL AND BUDGETARY PARAMETERS

A. Organizational Structure of Fire Management Program

This section discusses areas of responsibility for implementation of the fire management program at ASIS by specific seashore position. There may be instances where the same person functions in two or more areas of responsibility, i.e. the Chief Park Ranger and the Seashore Fire Coordinator may be the same person. The purpose of this section is to clearly define areas of responsibility, provide clear direction and accountability, and further the development of a responsive wildland fire management program.

1. Superintendent

Wildland fire management at ASIS is the ultimate responsibility of the Superintendent, with technical duties and accompanying responsibilities delegated to staff members. The Superintendent will be responsible for management of the program within Departmental and National Park Service policy, Directors Orders #18, Reference Manual # 18, and all relevant laws and regulations.

- Ensures that a comprehensive fire management program is adequately planned, staffed, and implemented and that the Fire Management Plan is reviewed annually and revised as necessary.

- Maintains and facilitates public and media relations pertaining to both suppression and prescribed fire.

- Approves prescribed fire plans.

- Approves of the use of mechanized, ground disturbing equipment, as appropriate.

2. Acting Superintendent

The Acting Superintendent is delegated all decision making responsibility when the Superintendent is absent from the seashore.

3. Chief Ranger

- Responsible for the overall coordination, direction, supervision, and management of the seashore fire management program.

- Coordinates the fire program with other Division Chiefs and other agencies.

- Appoints a qualified Incident Commander (IC) on large or complex fires. Authority is delegated to the IC in writing, setting objectives, authority, and responsibilities. The Delegation of Authority is found in Appendix I.

- Requests assistance from, and approves assistance to, other parks, regions, or agencies.

- Serves as the Liaison Officer and Agency representative.

- Supervises the Seashore Fire Coordinator (if applicable).

- Serves as Chair of the Seashore Fire Management Committee. Presents approved committee recommendations to the Superintendent.

- Responsible for implementation and execution of all aspects of the Fire Management Program *except* research.

- Responsible for overall coordination, direction, and supervision of fire prevention, preparedness, and suppression.

4. Assistant Chief Ranger (Supervisory Park Ranger)

- Assumes fire management duties of the Chief Ranger in his/ her absence.

- Responsible for ensuring public safety and recommends use restrictions and closures to the Chief Ranger.

- Responsible for arranging and coordinating appropriate safety signing, law enforcement assistance and dispatch assistance.

- Responsible for assigning staff to fire management activities.

5. Seashore Fire Coordinator

- Responsible for fire management program activities. Prepares and administers the Fire Management Plan and the annual FIREPRO budget. Revises the plan annually and incorporates any necessary changes.

- Advises and informs seashore staff, as needed, of all fire activity information in prioritized fashion.

- Responsible for completing the prevention analysis to determine the level and type of prevention effort required by the seashore. Ensures implementation of the approved fire prevention program.

- Responsible for initial attack activities and implementation of appropriate suppression response as recommended by the Seashore Fire Management Committee.

- Responsible for the oversight of safe suppression of all wildland fires with an unplanned ignition source, as well as for the coordination of demobilization of personnel and rehabilitation of burned areas (if necessary).

- Responsible for submission of fire situation reports to NPS Branch of Fire Management and the Regional Fire Management Officer (through Area FMO at SHEN).

- Responsible for providing fire training opportunities to seashore personnel to maintain predetermined fire qualification skills in critical positions. Reviews, updates, and maintains fire training and fire experience records. Submits updated records to the Area Fire Management Officer at SHEN.

- Ensures adequate inventory of equipment and supplies to efficiently implement the fire management program.

- Develops the annual prescribed fire program (for submission to the Seashore Fire Committee), including writing prescribed fire plans and conducting approved prescribed fires. (Qualified technical expertise from other sources will be made available to prepare and implement plans if there are no qualified person(s) on the seashore staff).

- Ensures the preparation of individual prescribed fire plans in accordance with DO #18 and RM #18, and submits each prescribed fire plan to the Superintendent for approval.

- Ensures that both a Briefing Statement and Delegation of Authority are prepared for incoming Incident Management Teams.

- Coordinates dispatch of seashore personnel for in-house fire assignments. Provides assistance to other parks and agencies. Requisitions fire crews, fire resources, and supplies for use in seashore incidents.

- Prepares, reviews, and revises cooperative agreements with interagency cooperators. Maintains liaison with interagency cooperators through annual meetings to review agreements.

- Maintains technical references, maps, and aerial photos for the fire program.

- Responsible for completion of all fire reports (DI-1202s), and coordinates the timely entry of reports into the NPS computer system with the Area FMO

(through the Area Fire program Assistant) at Shenandoah within 10 days of a fire.

- Prepares necessary evaluation information for each fire as well as timely updates of current and predicted fire weather and behavior. Provides technical advice and recommendations to the Seashore Fire Committee as the fire season progresses.

- Coordinates initial attack of all wildland fires that require suppression activity.

- Responsible for overall coordination, direction, and supervision of fire prevention, preparedness, and suppression.

- Briefs the Chief of Resource Management and the Chief Ranger (if applicable) on current and predicted fire management activity.

- Recommends approval of the Fire Management Plan to the Chief Ranger (if applicable).

- Serves on the Seashore Fire Management Committee.

- Evaluates all plans to ensure seashore resources are not adversely affected.

6. Chief of Natural Resources

- Coordinates fire research efforts with the Seashore Fire Coordinator and serves as the primary resource advisor for all wildfires, both planned and unplanned.

- Serves as a member of the Fire Management Committee.

- Assists in developing resource objectives for hazard fuel reduction projects, as well as for prescribed fires.

- Assists in the planning and coordination of prescribed fires.

- Provides input, as appropriate, into the Delegation of Authority.

- In the absence of a Cultural Resource Professional on staff, provides direction for fire management operations in all matters pertaining to cultural resource protection.

7. Chief of Interpretation and Visitor Services or Interpretation professional.

- Coordinates and prepares all press releases and coordinates all public information activities.

- Allows staff opportunities to participate in fire management activities to the extent practicable.

- Serves as a Seashore Fire Management Committee member.

- Supports fire management activities through the implementation of a variety of methods: site bulletins, circulars, press releases, interpretive and educational programs. Education of the public during wildland fire events, both planned and unplanned, is critical and is best expressed through interpretive outreach.

8. Area Fire Management Officer

- The Area Fire Management Officer is the Fire Management Officer at Shenandoah NP. As the Area FMO this individual is responsible for providing fire management assistance to ASIS upon request.

- Requests for assistance from the Area FMO will be coordinated through Shenandoah NP. Requests should be made as far in advance as is practical.

- The Area FMO will provide fire management expertise and advice at the planning and implementation levels.

- The Area FMO will help the seashore arrange for needed resources and equipment, and will assist in preparing FIREPRO funding requests.

- The Area FMO may be requested to serve as the agency representative regarding activities with an incident management team.

- The Area FMO will assist the seashore in establishing the Seashore Fire Management Committee, and will serve as an ex-officio member of that body. His/ her participation will serve to provide professional expertise necessary for program planning and decision making.

9. Area Fire Ecologist

- The Area Fire Ecologist is the Fire Ecologist at Shenandoah NP. This individual is responsible for providing fire ecology assistance to the National Park Service areas in the Mountains-to-the-Sea group of parks.

- Requests for assistance from the Area Fire Ecologist will be coordinated through the SHEN FMO. Requests should be made as far in advance as is practical.

- Requests for use of the Fire Effects Monitors will be made directly to the Area Fire Ecologist at SHEN.

- The Area Fire Ecologist will provide fire ecology expertise and advice at the planning and implementation levels upon request.

10. Dispatch (Optional dependent upon staffing)

- Receives wildland fire reports and call-out requests.

- Completes ASIS Wildfire Report and Call-Out form.

- Notifies the Seashore Fire Coordinator of any wildfire report.

- Ordering and tracking resources per National Interagency Incident Management Systems (NIIMS) protocols. Complete all resource order forms.

- Monitoring and recording all fire communications.

- Assist in the training of new fire dispatchers, assuring their familiarity with the Fire Management Plan. Certify that each meets IFQS standards.

- Provides personnel as requested for operational and logistical support.

- Retrieve daily fire weather from VDOF website and transmit appropriate staffing class to seashore personnel through approved channels.

11. Administrative Division

- Provides qualified personnel and equipment to fire management operations upon request.

- Assists dispatch personnel with processing fire resource orders, purchasing, and timekeeping.

12. Maintenance Division

- Provides qualified personnel and equipment to fire management operations upon request.

- Employees serve as first line reporting source for any wildland fire ignitions, immediately reporting them through seashore communications channels.

- Responsible for maintenance of all fire breaks and fire roads within the seashore.

- Provides assistance during wildland fires and prescribed burns e.g. setting up traffic signs, traffic control, equipment maintenance, distribution of supplies and equipment, and site preparation.

- Assists in developing and presenting fire fighting, ICS and fire overhead training.

- Gives priority to the repair and maintenance of emergency fire suppression equipment over other repair activities during incident operations.

13. Interpretive Division

- Forward reports of wildland fires through seashore communications channels.

- Supplies qualified personnel to Fire Management Operatons upon request.

- Assists in educating the public and seashore employees about the seashore's Fire Management Program and the role of fire in the environment. Assists in preparing presentations, publications, and press releases reference the Fire Management Program. Prepares site bulletins and appropriate information regarding prescribed and wildland fire for dissemination to the public.

- Provides on-site assistance during on-going wildland (both suppression and prescribed) fires with interpretive presentations or displays and hand-outs.

14. Cultural Resource Professional (The duties of this position may be filled by the Chief of Natural Resources or they may be delegated).

- Prepares 106 compliance documents for prescribed burn projects.

- Assists in the development and presentation of cultural resource identification and protection training to fire fighters.

- Provides a cultural resource staff member to serve as the cultural resource professional on wildland fires at the seashore. Provides advice to the IC in the identification of cultural resources and defines appropriate procedures to protect and/ or rehabilitate cultural resources.

- Provides maps and inventories of cultural resources for use in the fire management program.

- Serves as a member of the Seashore Fire Management Committee.

15. Patrol Supervisor and Staff

- Patrols all seashore areas, enforcing fire prevention regulations and serving as the initial response to wildland fire incidents.
- Supplies personnel to support fire management operations.
- Assists in educating the public about the seashore's Fire Management Program.
- Provides traffic control during wildfire and prescribed burns.
- Assists with investigations of all arson incidents.

16. Criminal Investigator (Law Enforcement Ranger)

- Conducts investigations of all wildland fires.
- Assists the Patrol Supervisor with fire prevention activities.

B. FIREPRO Funding

ASIS does not have any FIREPRO funded positions. FIREPRO *does* fund approved fire and hazard fuel projects. FIREPRO funding is also authorized for approved fire training, preparedness, suppression, equipment, personal protective equipment, and burned area emergency stabilization and rehabilitation projects.

FIREPRO funds are managed through the Northeast Region Fire Management Office. Requests for FIREPRO funding are made directly from ASIS to the Area Fire Management Officer at SHEN who will, in turn, submit them to the Regional Fire Management Office. The Fire Program Assistant at SHEN will be available to provide practical assistance in regards to those budget requests that support the ASIS Fire Management Plan.

C. Fire Management Organization

Successful implementation of a fire management program requires the cooperative effort of *all* divisions. The Seashore Fire Coordinator, with assistance from staff in the natural, cultural, interpretive, maintenance and protection areas will make necessary arrangements to secure the use of qualified seashore fire personnel. The appropriate Division Chief or Superintendent must approve this request for assistance. Seashore staff will provide resource advisors for assignment to fires within the seashore during suppression operations, and conduct post-fire research projects, as necessary, to assess fire effects. Resource advisors may be from Cultural Resources (archeology, cultural site location, etc.), Natural Resources (fire effects, suppression techniques, GIS, etc.), and Maintenance (equipment availability, seashore utilities, etc.).

The Seashore Fire Management Committee at ASIS will be made up of the Chiefs of Interpretation and Visitor Services, Maintenance, Resource Protection and Visitor Management, Natural Resources, and the Seashore Fire Coordinator. The Chief of Resource Protection and Visitor Management (Chief Ranger) will chair the Committee. The Committee may request technical expertise from other individuals at any time. (As a practical matter, the Area Fire Management Officer and Fire Ecologist can be expected to participate as ex-officio members during planning processes requiring their input and/ or expertise). Each committee member should designate an alternate to serve in the event that the normal representative is unavailable.

In an effort to coordinate the seashore's fire management program with those of other nearby parks, the Area Fire Management Officer at SHEN, may annually organize a meeting of all park units in the Mountains-to-Sea Group of parks. Topics to be discussed include such items as equipment ordering and procurement, personnel needs, budget requests and program support relating to wildland fire programs at each of the parks. Along with Assateague Island National Seashore, parks participating include: Appomattox Court House National Historic Park, Booker T. Washington National Monument, Fredericksburg & Spotsylvania NMP, Colonial National Historical Park, Fort McHenry NHS, George Washington Birthplace NM, Hampton NHS, Petersburg National Battlefield, Shenandoah NP, Richmond NBP, and Thomas Stone NHS. The Area FMO will coordinate this activity.

The Seashore Fire Management Committee will convene at the request of the any of the members or the Superintendent. The primary purpose of the Committee is to coordinate preparedness, suppression, and prescribed fire activities between the seashore's divisions and among its cooperating agencies.

1. Committee Actions during Prescribed Burns

   During any active prescribed burn, the Seashore Fire Coordinator, representing the Committee, will brief the Superintendent at least once daily, or as often as necessary, on the current fire situation. Alternatives and recommendations for any change in the management strategy for the fire will be presented. During the progress of any prescribed burn, the Prescribed Burn Boss will ensure that a contingency plan is prepared should the burn exceed prescription. The Superintendent has final and complete authority for all fire management decisions.

2. Committee Actions during Suppression Fires

   Any fire being managed as a suppression fire that threatens to exceed initial attack capabilities will have a qualified Incident Commander assigned to manage the fire. If a fire extends beyond one operational period, the Incident Commander will ensure that a Wildland Fire Situation Analysis (WFSA) is prepared.

3. Committee Actions during Non-Fire Periods

The Committee may be convened during periods of high fire danger to coordinate preparedness activities. The Committee will also be convened at other times to coordinate the seashore's hazard reduction/ prescribed fire activities. In addition, the Committee will coordinate equipment and personnel needs with those of other nearby parks.

D. Wildland Fire Use Certification

This option was rejected due to the small size of the seashore and limited staffing.

E. Interagency Coordination

Agreements (Memorandum of Understanding or MOU's) have been established between the Maryland Department of Natural Resources, Forest Service, and the Virginia Department of Forestry (VDOF), for the purpose of promoting effective fire management in their respective states. See Appendix N for copies of these agreements.

Agreements for mutual aid fire protection are currently in place with the Berlin Fire Company, U.S. Fish and Wildlife Service, and Assateague State Park. Copies of these agreements can be found in Appendix P.

Additional agreements should be developed with each of the volunteer fire departments that currently operate with the seashore on a regular basis. For example, an agreement should be developed with the Chincoteague Volunteer Fire Department as a means to provide effective protection for the Virginia Fire Management Unit. A copy of a pre-approved template for this agreement can be found in Appendix P.

Contacts with these agencies should be made at least annually to discuss specific aspects of each of the Agreements and their applicability to the seashore's fire management program.

F. Interagency Contacts

See Appendix O.

G. Fire-Related Agreements

See Appendix P.

VI. MONITORING AND EVALUATION

A. Monitoring Programs

The seashore will implement long and short term monitoring as a means to determine and document accomplishments, as well as ascertain the effects (if any) of management activities on cultural and natural resources.

The seashore will work closely with the Area Fire Ecologist at and the Fire Effects Monitoring Team located at Shenandoah NP. The Area Fire Ecologist should be consulted concerning possible future prescribed fire plans with regard to potential fire effects and desired conditions. The Fire Effects Monitoring Team will assist the seashore in establishing and reading vegetation plots, as well as in monitoring fire effects resulting from prescribed fire and non-fire hazardous fuel project activities.

B. NPS Fire Monitoring Handbook

This handbook will serve as the source document providing monitoring needs with minor adaptations made for local situations and conditions. A copy of this reference will be provided upon request by the Fire Monitoring Staff located at SHEN.

C. Fire Monitoring Plan

A Fire Monitoring Plan can be found in Appendix Q. This plan will be developed and adapted locally as the seashore fire program progresses.

VII. FIRE RESEARCH

A. Previous and Ongoing Research

Beginning In 1993, the staff of the Assateague Island National Seashore recognized the need for research in areas pertaining to wildland fire, especially in regard to fire effects and accompanying impacts on vegetation and fuels.

A **Fire vegetation Study, Assateague Island National Seashore (April 24, 1993),** was completed as an internship study by Laura Ann Stephens of Northern Arizona University. The study was completed in response to a seashore request for a fire vegetation study to be done in order to determine the feasibility of using fire as a management tool to manage encroaching vegetation behind a man-made dune line. The study involved gathering grass coverage data, fuel counts, and large shrub data for a proposed prescribed burn site.

In April, 1993, a **Fire Effects Study – Shrub and Fuels Reduction, Project and Experimental Design** was prepared by C. E. Furbish, who was at that point in time, the Natural Resource Specialist for Assateague Island National Seashore. The study was prepared in response to the search for management alternatives to effectively restore grass/ sedge meadow and open interdune plant communities that had been replaced by thick shrub communities. The purpose of the study was to assess the feasibility of using prescribed fire as a short-term tool used for the reduction of shrubs and fuel loading in the undeveloped zone, and as a long-term tool for maintaining open plant communities and low fuel loads in the developed zone. In some areas of the seashore, the proliferation of shrub communities had proliferated largely as the result of the construction of an artificial dune that was largely responsible for altering the natural overwash systems that had previously regulated

vegetation community development at the seashore. A secondary concern was the presence of unnatural fuel levels that existed in the shrub thickets and their potential for the creation of hazardous wildland fire conditions. Additionally, the presence of a large number of cultural resources in areas where hazardous fuel levels were believed to be found at elevated levels, raised concerns about protection of those resources from the heightened risk of wildland fire. The first application of prescribed fire under the auspices of this project was applied on March 20, 1994.

In addition, there has been substantial research completed in the areas of fire effects, occurrence, and vegetation that are relevant and applicable to the seashore's fire management program, even though they have not been conducted on the physical site of the seashore.

B. Needed Research

A thorough study of the role of fire, including an exhaustive look at historic island fire occurrence and land-use patterns, should be undertaken. Included in this study should be an analysis of fire regimes, both current and past, and the impacts that they have on current vegetation and natural resources. The ultimate objective would be to ascertain the role and relative importance of wildland fire in shaping ecosystem processes.

The seashore contains scattered populations of the highly invasive plant, common reed (*Phragmites australis*). While not yet found in large-scale monotropic stands, the potential exists for such areas to develop. Since prescribed fire has been used effectively (usually in conjunction with additional chemical and/ or mechanical treatments) as a method of controlling the large-scale spread and proliferation of this species in other habitats similar to Assateague island, research into the use of prescribed fire as a management tool to control common reed would seem to be a goal worth pursuing.

Research is needed to further investigate the effectiveness of the use of prescribed fire as a fuel reduction technique in a variety of vegetation types, determine species replacement under various burning regimes, describe fire behavior in certain regimes, and, if possible, develop fuel models that would more accurately predict fire risk assessment in representative fuel types.

As the seashore's Fire Management Plan is implemented and tested, additional research will inevitably be identified for such purposes as refining prescriptions, improving the understanding of fire behavior and fire effects on vegetation, refining monitoring protocols, defining desired future vegetation conditions, fire return cycles, describing the impacts on both cultural and natural resources, and gathering other information needed for operational fire and resource management activities.

VIII. PUBLIC SAFETY

A. Public Safety Issues and Concerns

The *primary* goal of the Assateague Island National Seashore fire management program is to ensure the safety of all staff and visitors, as well as federal, state, and private property adjacent to the seashore's boundary. Depending upon the circumstances, the Superintendent may close all or a portion of the seashore (including roads and trails) when wildfire or a prescribed fire pose an imminent threat to public safety.

B. Mitigation Safety Procedures

The seashore will implement a notification system to inform cooperators *and* visitors of all fire activity through normal communication channels. A fire activity report will be updated as significant changes occur, to inform seashore personnel of potential fire threats. Areas of fire activity will be clearly signed at visitor centers and seashore bulletin boards. Cooperating agencies, as well as island residents and landowners adjacent to the seashore will be notified in advance of any prescribed burns. In addition, if any unscheduled wildland fires pose a threat to resources outside of seashore boundaries, similar notifications will be provided for in a timely fashion. The cooperative use of local law enforcement personnel and/ or uniformed seashore staff to implement this portion of the program is recommended.

IX. PUBLIC INFORMATION AND EDUCATION

A. Public Information Capabilities and Needs

The seashore is committed to keeping the public informed about its fire management program and associated activities. Educational opportunities will be developed to reach as many segments of the public as possible. This may include special interest groups, schools, public organizations, and other groups. Materials and educational programs are available through the Area Fire Management Officer at SHEN that will help deliver information concerning the role fire plays in preserving and protecting cultural and natural resources of all public lands, including the seashore.

A Regional Fire Education, Prevention, and Information Specialist is a resource that is available to the seashore for consultation and support. See Appendix O.

B. Step-Up Public Information Activities

Information and education are important processes in public acceptance of the managed fire program at seashore. The Division of Interpretation and Visitor Services will coordinate all public information activities with the assistance of and other seashore staff. They will provide the Superintendent with accurate information regarding current fire situations and management activities. The public information program will be developed as follows:

- Concepts of the prescribed fire program will be incorporated, as appropriate, in seashore publications, brochures, and handouts.

- During periods when prescribed fires are to be ignited, handouts will be prepared and distributed to all visitors entering areas of fire activity.

- The fire management program will be incorporated into visitor contacts, interpretive talks, walks, and tour programs. Particular attention will be given when fires are conspicuous from trails, roads or visitor use areas.

- News releases will be distributed to the media as appropriate.

- The public information outlets of neighboring, cooperating agencies, as well as the Northeast Regional Office (through the Area FMO) will be provided with all fire management information.

- The role of the fire management program at the seashore will be developed and discussed, as appropriate, in off-site programs and talks.

- The fire management program will be discussed in informal talks with employees of all divisions, concessionaires, contractors, volunteers, residents, and seashore neighbors.

As outlined in the prevention section, emergency closures or restrictions may become necessary during periods of extreme or extended fire danger. Such closures will necessitate additional coordination and communication with the public, the media, and cooperating agencies and the public.

X. PROTECTION OF SENSITIVE RESOURCES

A. Archeological/Cultural/Historic Resources Needing Protection and/or Treatment

ASIS has valuable cultural and historic resources, including numerous historic buildings, hunting lodges, cemeteries, archeological sites, etc, within its boundaries. Also, the potential exists for significant resources to be uncovered during fire activities that disturb the mineral soils of the seashore. Therefore, fire management activities entailing soil disturbance activities will be especially closely coordinated and monitored.

Maps of the location of sensitive cultural resources are found in Appendix V.

Consultation with the State Historic Preservation Offices of both Maryland and Virginia (SHPO) will be considered if any potential exists to cumulatively or adversely affect any cultural resources in the applicable Fire Management Units (FMU's) contained within the states of Maryland and/ or Virginia. All effects will be evaluated on a case-by-case basis and/ or in accordance with an approved programmatic agreement for cultural resource management. This process will be clearly spelled-out in either the prescribed burn plan or in the Delegation of Authority in the event of a wildland fire. Non-fire treatments to remove hazardous fuels will also follow this same clearance process.

B. Natural Resources Needing Protection and/or Treatment

Information about plant and animal species that have been listed as federally threatened, endangered, or that are state listed species, and that live either on or in close proximity to Assateague Island National Seashore have been provided by the Natural Resource Management Staff of Assateague Island, as well as a number of other agencies, including the Maryland Department of Natural Resources, The Nature Conservancy, and the U.S. Fish and Wildlife Service. Detailed discussions of individual species are found in the section on threatened and endangered species beginning on page 26 of this Fire Management Plan.

Information relating to species located on the Virginia end of the island is generally omitted from further discussion. These lands, with the exception of a very small parcel, are managed by the U.S. Fish and Wildlife Service under an interagency agreement with Assateague Island National Seashore.

The Assateague Island National Seashore document *Critical Issues*, has identified a series of resource management concerns that are earmarked to receive priority management action. One of these identified issues is the need to protect and manage rare, threatened, and endangered species. Portions of the seashore provide suitable habitat for a variety of state and federally listed species both flora and fauna (table 9). The known and perceived threats to these species vary in intensity, and include a range of causative factors that include recreational activities, disruptions to natural coastal ecosystem processes, and interactions with both native and non-native and Invasive species. Several of the high-profile species, such as the piping plover (*Charadrius melodus)* and sea beach amaranth (*Amaranthus pumilus)* are being actively managed, but others remain poorly understood and are largely unmanaged at this point in time. In addition, a number of rare resident plant, insect, and transient bird species are in need of having additional studies conducted with regard to threat mitigation, routine evaluation of condition, and completion of appropriate levels of documentation.

National Park Service policy (NPS 2001) requires that protection be provided to state-listed flora and fauna that are designated as species of concern. The protective measures afforded the so-designated species are similar to the protection afforded to federally listed threatened and endangered species.

Table – 9 Threatened and Endangered Species and Species of Concern at Assateague Island National Seashore.

Federal Endangered and Threatened Species and State of Maryland Species of Concern at ASIS			
Common/ Scientific Name	**Federal**	**State**	**Other**
Plants			
Sea Beach Amaranth	LT	E	

Amaranthus pumilus			
Koehne's ammannia *Ammannia latifolia*		S2	
Sea-beach three-awn *Aristida tuberculosa*		S1	
Sea ox-eye *Borrichia frutescens*		SH, X	
Sea-beach-sedge *Carex silicea*		S1,E	
Coinleaf *Centella erecta*		S?	
Sessile-leaved tick-trefoil *Desmodium sessilifolium*		SH, X	
White Spikerush *Eleocharis albida*		S2, T	
Salt-marsh spikerush *Eleocharis halophila*		S?	
Beaked spikerush *Eleocharis rostellata*		S2?	
Meadow lovegrass *Eragrostis refracta*		S?	
White-bracted boneset *Eupatorium leucolepis*		S2,S3, T	
Carolina fimbry *Fimbristylis caroliniana*		S1,S2	
Smooth fuirena *Fuirena pumila*		S2,S3	
Coast bedstraw *Galium hispidulum*		S1, E	
Broad-leaved beardgrass *Gymnopogon brevifolius*		S1, E	
Sea-beach sandwort *Honckenya peploides*		S1, E	
Clasping-leaved St. John's wort *Hypericum gymnanthum*		S1, E	
Torrey's rush *Juncus torreyi*		S1, E	
Long-awned diplachne *Leptochloa fusca ssp.*		S?	

Fascicularis			
Swamp bay *Persea palustris*		S?	
Crested yellow orchid *Platanthera cristata*		S?	
Seaside knotweed *Polygonum glaucum*		S1, E	
Slender pondweed *Potamogeton pusillus*		S1	
Beach plum *Prunus maritime*		S1, E	
Clustered beakrush *Rhynchospora glomerata*		S?	
Sacciolepsis *Sacciolepsis striata*		S1, E	
Whorled nutrush *Scleria verticillata*		S1, E	
Sea-purslane *Sesuvium maritimum*		S1, E	
Grass-leaved ladies-tresses *Spiranthes praecox*		S1	
Mammals			
Finbacked whale *Balaenoptera physalus*	LE	E	
Humpback whale *Megaptera navaeangliae*	LE	E	
Sperm whale *Physeter catodon*	LE	E	
Delmarva fox squirrel *Sciurus niger cinereus*	LE	S1,E	Believed to be found only on the VA end of island
Birds			
Piping plover *Charadrius melodus*	LT	E	
Bald eagle *Haliaeetus leucocephalus*	LT	T	
Wilson's plover *Charadrius wilsonia*		E	
Northern harrier *Circus cyaneua*			

Sedge wren *Cistothorus pletensis*		E	
Swainson's warbler *Limnothlypis swainsonii*		E	
Yellow-billed cuckoo *Coccyzus americanus*	C		
Yellow-crowned night-heron *Nyctanassa violacea*		S?	
Pie-billed grebe *Podilymbus podiceps*		S?	
Black skimmer *Rynchops niger*		E	
Least tern *Sterna antillarum*		T	
Royal tern *Sterna maxima*		E	
Gull-billed tern *Sterna nilotica*		E	
Sandwich tern *Sterna sandvicensis*		S?	
Red-cockaded woodpecker *Picoides borealis*	LE	X	Former native of Worcester County MD. May be suitable habitat on ASIS
Amphibians and Reptiles			
Atlantic Loggerhead turtle *Caretta caretta*	LT	T	
Atlantic green turtle *Chelonia mydas*	LE	T	
Atlantic leatherback turtle *Dermochelys coriacea*	LE	E	
Atlantic Kemp's ridley turtle *Lepidochelys kempii*	LE	E	
Broadhead skink *Eumeces laticeps*		S?	
Red-bellied water snake *Nerodia e.*		S?	

erythrogaster			
Carpenter frog *Rana virgatipes*		I	
Eastern narrow-mouthed toad *Gastrophryne carolinensis*		E	
Barking treefrog *Hyla gratiosa*		E	
Insects			
Palamedes swallowtail *Papilio palamedes*		E	
A tiger beetle *Cicindela abdominalis*		E	
White tiger beetle *Cicindela dorsalis media*		E	
Little white tiger beetle *Cicindela lepida*		E	

CODES

Federal Status

LE Taxa listed as endangered; in danger of extinction throughout all or a significant portion of their range.

LT Taxa listed as threatened; likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

C Candidate taxa for listing for which the USFWS has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened.

State Rank

S1 Highly State rare. Critically impaired in Maryland because of the extreme rarity (typically 5 or fewer estimated occurrences or very few remaining individuals or acres in the State) or because of some factor(s) making it especially vulnerable to extirpation. Species with this rank are actively tracked by the Natural Heritage Program.

S2 State Rare. Imperiled in Maryland because of rarity (typically 6 to 20 estimated occurrences or very few individuals or acres in the State) or because of some factor(s) making it vulnerable to becoming extirpated. Species with this rank are actively tracked by the Natural Heritage Program.

S3 Rare to uncommon with the number of occurrences typically in the range of 21 to 100 in Maryland. It may have fewer occurrences but with a large number of individuals in some populations, and it may be susceptible to large-scale disturbances. Species with this rank are *not* actively tracked by the Natural Heritage Program.

SH Historically known from Maryland, but not verified for an extended period (usually 20 or more years), with the expectation that it may be re-discovered.

S? This species has not yet been ranked.

State Status

This is the status of a species as determined by the Maryland Department of Natural Resources, in accordance with the Non-game and Endangered Species Conservation Act. Definitions for the following categories have been taken from the Code of Maryland Regulations (COMAR) 08.03.08.

E Endangered; a species whose continued existence as a viable component of the State's flora or fauna is determined to be in jeopardy.

I In Need of Conservation; an animal species whose population is limited or declining in the State such that it may become threatened in the foreseeable future if current trends or conditions persist.

T Threatened; a species of flora or fauna which appears likely, within the foreseeable future, to become endangered in the State.

X Endangered Extirpated; a species that was ounce a viable component of the flora and fauna of the State, but for which no naturally occurring populations are known to exist in the State.

There are no other known critical natural resources needing special protection or treatment. .

Additional protective measures must be considered as new information emerges from the National Park Service's I&M and Vital Signs program.

C. Developments, Infrastructure, and Improvements Needing Protection and/or Treatment

As funding allows, defensible space will be maintained around developments, infrastructure, and other improvements located at the seashore. The ASIS Wildfire Prevention Analysis and Plan contains specific actions that are to be taken in order to protect critical cultural and capital resources. See Appendix U.

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

Fire reviews will be conducted in accordance with Directors Orders #18 and Reference Manual #18. Each review will be documented and filed with the final fire report. The Seashore Fire Coordinator will retain a copy for the seashore's files.

The Seashore Fire Coordinator will be responsible for completing an annual fire summary report of any critiques that have occurred during the year. The report will contain the number of fires by ignition type; acres burned by fuel type, a cost summary, personnel utilized, and fire effects.

The Seashore Fire Coordinator will review the Fire Management Plan annually for currency and incorporate changes into the appendix. Changes to the appendices require approval of the Seashore Fire Management Committee. **This fire management plan is subject to formal review every five years.**

The Incident Commander or the Prescribed Fire Burn Boss will critique wildland and prescribed fires respectively. This critique should take place with those directly involved in the management of the fire, and should be completed as soon as is practicable.

The Seashore Fire Management Committee should review prescribed and wildland fires of significant size, cost, or where minor safety issues or minimal levels of public concern occur. These findings should be forwarded to the Regional Fire Management Officer through the Area Fire Management Officer.

Prescribed or wildland fires involving an Incident Management Team or significant political, safety, or public issues should be reviewed by the Regional Fire Management Officer. If a fire generates a major political or public concern, and/ or involves multiple serious injuries or a fatality, the National Park Service Fire Management Program Center located at Boise should conduct or participate in the review.

XII. CONSULTATION AND COORDINATION

The seashore Superintendent is responsible for coordination and consultation with cooperators regarding fire management activities. Activities include involvement with local volunteer fire departments, state forestry officials and air quality boards, as well as nearby wildlife refuges, state parks, and the National Weather Service. As a practical matter, the performance of these activities will be delegated to a select member(s) of the seashore staff. Generally these duties will be undertaken by the Seashore Fire Coordinator.

The following people were involved in the formulation and preparation of this fire management plan:

Mike Anderson, Chief, Visitor Protection, Assateague Island National Seashore, National Park Service, Berlin, Maryland.

Allen Biller, Fire Management Officer (Retired), Shenandoah National Park, National Park Service, Luray, Virginia

KellyAnn Gorman, Fire Ecologist, Shenandoah National Park, National Park Service, Luray, Virginia

Paul Head, Fire Management Officer (Retired), Northeast Region, National Park Service, Boston, Massachusetts

Michael L. Hill, Former Superintendent, Assateague Island National Seashore, National Park Service, Berlin, Maryland

Jacki Katzmire, Environmental Coordinator, National Park Service, Northeast Region, Philadelphia, Pennsylvania

Jack Kumer, Natural Resource Specialist, Assateague Island National Seashore, Berlin, Maryland.

Doug Raeburn, Fire Ecologist and Fire Management Officer (Retired), Shenandoah National Park, National Park Service, Luray, Virginia

Andrew Roach, Cartographic Technician, Assateague Island National Seashore, Berlin, Maryland

Mark Sturm, Ecologist, Assateague Island National Seashore, National Park Service, Berlin, Maryland.

Douglas Wallner, Fuels/ Fire Ecology Program Manager, Northeast Region U.S. National Park Service, Philadelphia, Pennsylvania

Carl Zimmerman, Natural Resource Management Specialist, Assateague Island National Seashore, National Park Service, Berlin, Maryland

XIII. APPENDIX

A. Compliance Documents (NEPA and NHPA)

B. Fire Management Unit Maps (Maryland and Virginia FMU's)

C. Species Lists

D. Seashore Vegetation Maps

E. Wildland Fire Implementation Plan Stage I Form

F. Staffing Class (Class Day Designation for Step-Up Planning)

G. Charts for Determining Appropriate Management Response

H. Wildland Fire Situation Analysis

I. Limited Delegation of Authority

J. Minimum Impact Suppression Tactics Guideline

K. Five Year Fuels Management Plan

L. Historic Fuels Treatment Map/ Fire History

M. State Emission Standards for Open Burning (Maryland and Virginia)

N. Interagency Agreements

O. Interagency Contacts

P. Fire Related Agreements

Q. Fire Monitoring Plan

R. Individual Fire Report Form, DI 1202

S. Fire Equipment Inventory

T. Fire Call-Up List

U. Wildland Fire Prevention Analysis and Plan

V. Maps of Sensitive Natural and Cultural Resources

W. Glossary

X. Bibliography

Y. State of Virginia Prescribed Fire Fact Sheet

APPENDIX A

COMPLIANCE DOCUMENTS

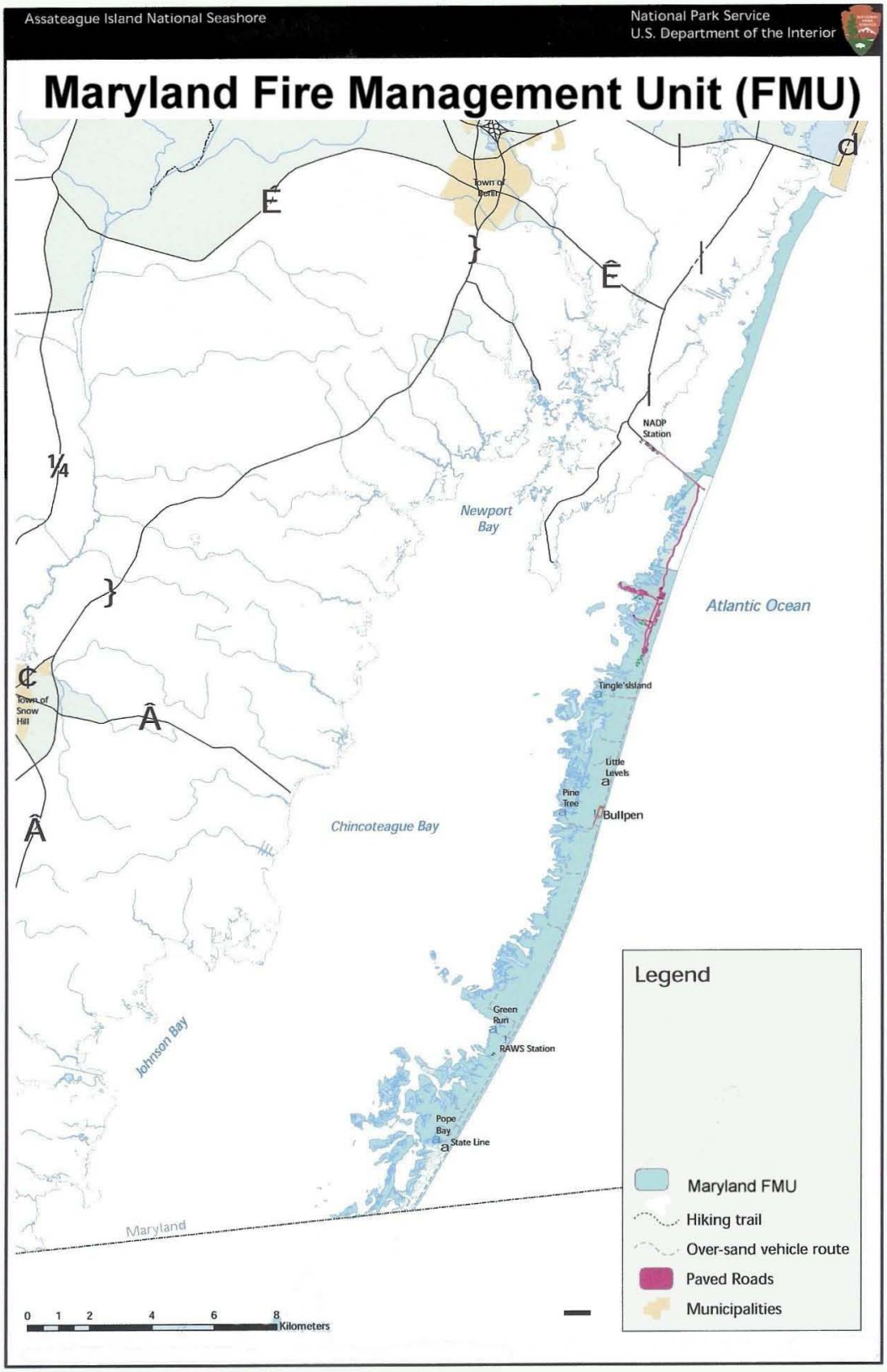
ENVIRONMENTAL ASSESSMENT

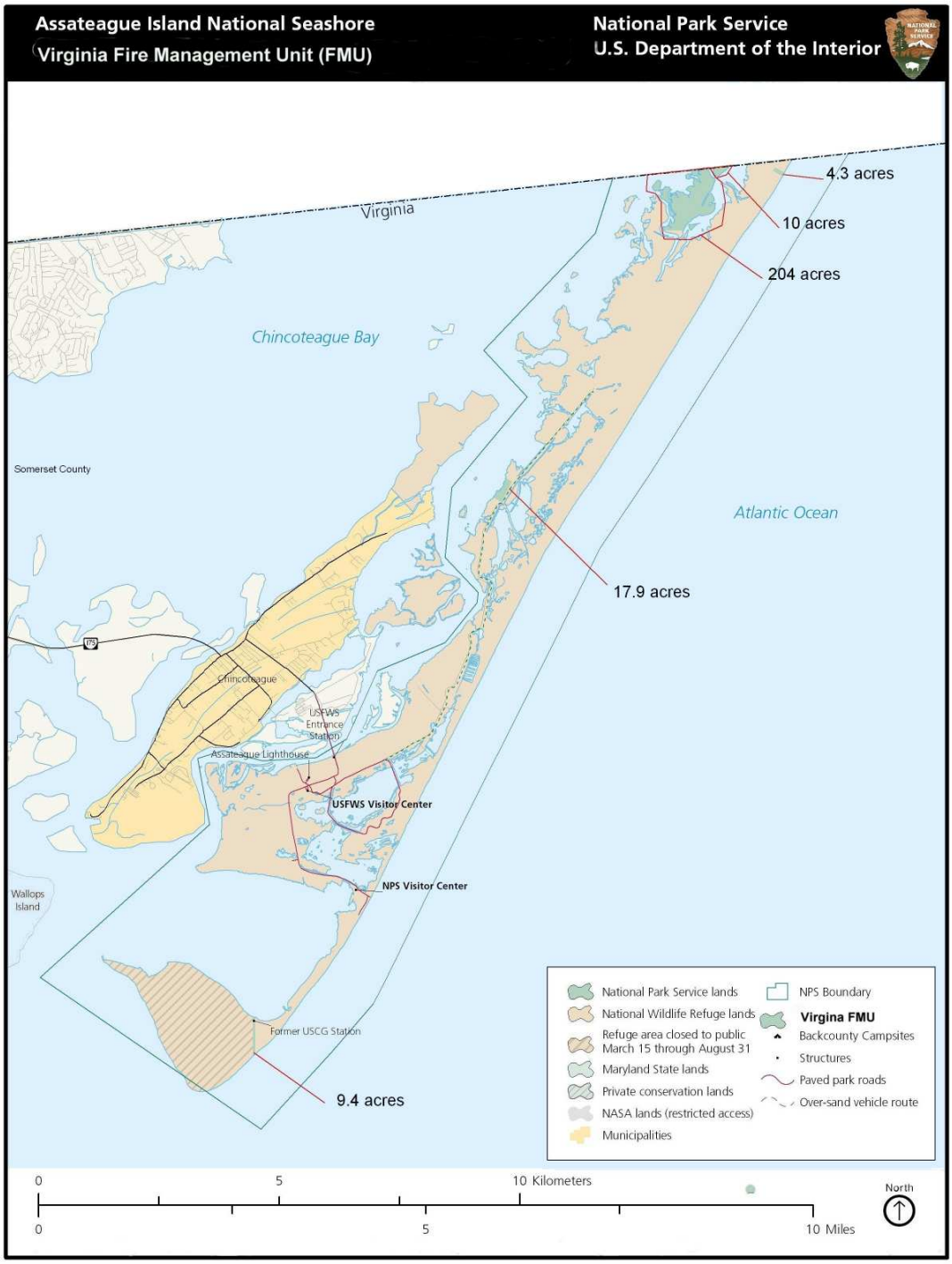
FINDING OF NO SIGNIFICANT IMPACT

The Environmental Assessment and the Finding of No Significant Impact are contained in separate documents under individual covers.

APPENDIX B

FIRE MANAGEMENT UNIT (FMU) MAPS


Assateague Island National Seashore
National Park Service
U.S. Department of the Interior
Maryland Fire Management Unit (FMU)
Town of Berlin
NADP Station
Newport Bay
Atlantic Ocean
Tingle Island
Town of Snow Hill
Little Levels
Pine Tree
Bullpen
Chincoteague Bay
Johnson Bay
Green Run
RAWS Station
Pope Bay
State Line
Maryland
0 1 2 4 6 8
Kilometers
Legend
Maryland FMU
Hiking trail
Over-sand vehicle route
Paved Roads
Municipalities


Assateague Island National Seashore
Virginia Fire Management Unit (FMU)
National Park Service
U.S. Department of the Interior
Virginia
Chincoteague Bay
Somerset County
Atlantic Ocean
4.3 acres
10 acres
204 acres
17.9 acres
9.4 acres
Chincoteague
USFWS Entrance Station
Assateague Lighthouse
USFWS Visitor Center
NPS Visitor Center
Wallops Island
Former USCG Station
National Park Service lands
National Wildlife Refuge lands
Refuge area closed to public March 15 through August 31
Maryland State lands
Private conservation lands
NASA lands (restricted access)
Municipalities
NPS Boundary
Virgina FMU
Backcounty Campsites
Structures
Paved park roads
Over-sand vehicle route
0
5
10 Kilometers
0
5
10 Miles
North

APPENDIX C

SPECIES LISTS

Assateague Island National Seashore Species List

Standard Scientific Name	Standard Common Name	Park-Status	Abundance
Abudefduf saxatilis	sergeant major	Present in Park	No data
Abutilon theophrasti	Indian mallow, butterprint, buttonweed, velvetleaf, velvetleaf (or butterprint), velvetleaf Indian mallow	Present in Park	Rare
Acalypha gracilens	slender copperleaf, slender threeseed mercury	Present in Park	Rare
Acalypha virginica	Virginia copperleaf, Virginia threeseed mercury, mercuryweed, threeseeded mercury, wax balls	Present in Park	Rare
Accipiter cooperii	Cooper's Hawk	Present in Park	No data
Acer rubrum	red maple	Present in Park	Common
Acer saccharinum	silver maple	Present in Park	Rare
Achillea millefolium	bloodwort, carpenter's weed, common yarrow, hierba de las cortaduras, milfoil, plumajillo, western yarrow, yarrow (common)	Present in Park	Uncommon
Actitis macularia	Spotted Sandpiper	Present in Park	No data
Aequipecten gibbus	No data	Present in Park	No data
Aequipecten irradians	No data	Present in Park	No data
Agalinis maritima	saltmarsh false foxglove, seaside gerardia	Present in Park	Uncommon
Agalinis purpurea	purple false foxglove	Present in Park	Common
Agardhiella tenera	No data	Present in Park	Unknown
Agelaius phoeniceus	Red-winged Blackbird	Present in Park	No data
Agrostis alba	No data	NA	NA
Agrostis alba var. palustris	No data	NA	NA
Agrostis hyemalis	winter bentgrass	NA	NA
Agrostis perennans	autumn bentgrass, upland bent, upland bentgrass	Present in Park	Common
Agrostis scabra	rough bent, rough bentgrass, ticklegrass	Present in Park	Uncommon
Agrostis stolonifera var. compacta	No data	NA	NA
Agrostis stolonifera var. major	No data	Present in Park	Common
Agrostis stolonifera var. palustris	No data	Present in Park	Uncommon
Ailanthus altissima	ailanthus, copal tree, tree of heaven, tree-of-heaven	Present in Park	Rare
Aira caryophyllea	silver hairgrass	Present in Park	Common
Aira praecox	yellow hairgrass	Present in Park	Occasional
Aix sponsa	Wood Duck	Present in Park	No data
Akebia quinata	chocolate vine	Present in Park	Rare
Albizia julibrissin	mimosa, mimosa tree, powderpuff tree, silk tree, silktree	Present in Park	Rare
Alcea rosea	hollyhock	Present in Park	Rare
Allium vineale	wild garlic	Present in Park	Rare
Alosa aestivalis	blueback herring, blueback shad	Present in Park	No data
Alosa pseudoharengus	alewife, bigeye herring, branch herring, freshwater herring, gray herring, grayback, kyak, sawbelly, white herring	Present in Park	No data
Alosa sapidissima	American shad, Atlantic shad, common shad, white shad	Present in Park	No data
Althaea rosea	No data	NA	NA
Aluterus schoepfi	orange filefish	Present in Park	No data
Amandinea punctata	No data	Present in Park	Abundant
Amaranthus cannabinus	tidalmarsh amaranth	Present in Park	Unknown
Amaranthus hybridus	green pigweed, slim amaranth, smooth amaranth, smooth pigweed	Present in Park	Rare
Amaranthus pumilus	Seabeach amaranth, seaside amaranth	Present in Park	Rare
Amathia dichotoma	No data	Present in Park	No data
Ambrosia artemisiifolia	Roman wormwood, annual ragweed, common ragweed, low ragweed, ragweed, short ragweed, small ragweed	Present in Park	Uncommon
Ambrosia trifida	blood ragweed, giant ragweed, great ragweed, horseweed, perennial ragweed (great), tall ragweed	Present in Park	Rare
Ameiurus catus	white bullhead, white catfish	Present in Park	No data
Ameiurus nebulosus	brown bullhead	Present in Park	No data

Amelanchier canadensis	Canadian serviceberry	Present in Park	Common
Ammannia latifolia	pink redstem	Historic	NA
Ammannia teres	No data	NA	NA
Ammodramus caudacutus	Saltmarsh Sharp-tailed Sparrow	No data	No data
Ammodramus caudacutus diversus	sharp-tailed saltmarsh sparrow	No data	No data
Ammodytes americanus	American sand lance, inshore sand lance, lance, sand eel	Present in Park	No data
Ammophila breviligulata	American beachgrass	Present in Park	Abundant
Anachis avara	greedy dovesnail	Present in Park	No data
Anadara ovalis	blood ark	Present in Park	No data
Anadara transversa	transverse ark	Present in Park	No data
Anagallis arvensis	pimpernel, scarlet pimpernel	Present in Park	Common
Anas acuta	Northern Pintail	Present in Park	No data
Anas americana	American Wigeon	Present in Park	No data
Anas clypeata	Northern Shoveler	Present in Park	No data
Anas crecca	Green-winged Teal	Present in Park	No data
Anas discors	Blue-winged Teal	Present in Park	No data
Anas penelope	Eurasian Wigeon	Present in Park	No data
Anas platyrhynchos	Mallard	Present in Park	No data
Anas rubripes	American Black Duck	Present in Park	No data
Anas strepera	Gadwall	Present in Park	No data
Anchoa hepsetus	broad-striped anchovy, striped anchovy	Present in Park	No data
Anchoa mitchilli	bay anchovy	Present in Park	No data
Andropogon glomeratus	bushy bluestem	Present in Park	Uncommon
Andropogon scoparius var. littoralis	No data	NA	NA
Andropogon ternarius	splitbeard bluestem	Present in Park	Rare
Andropogon virginicus	broomsedge, broomsedge bluestem, yellow bluestem	Present in Park	Common
Andropogon virginicus var. abbreviatus	No data	NA	NA
Andropogon virginicus var. glaucopsis	No data	NA	NA
Anguilla rostrata	American eel	Present in Park	No data
Anomalagrion	No data	Present in Park	No data
Anomia simplex	common jingle	Present in Park	No data
Anthemis arvensis	corn chamomile, mayweed, scentless chamomile	Present in Park	Uncommon
Anthoxanthum odoratum	sweet vernalgrass	Present in Park	Common
Apeltes quadracus	bloody stickleback, fourspine stickleback	Present in Park	No data
Apios americana	apios americana, groundnut, potatobean	Present in Park	Uncommon
Apocynum cannabinum	Indian hemp, Indian-hemp, Indianhemp, common dogbane, dogbane, hemp dogbane, prairie dogbane	Present in Park	Uncommon
Aquila chrysaetos	Golden Eagle	Present in Park	No data
Aquipecten irradians concentris	No data	Present in Park	No data
Arabidopsis thaliana	mouse-ear cress, mouseear cress	Present in Park	Uncommon
Arabis glabra	tower rockcress, tower-mustard	NA	NA
Aralia spinosa	angelicatree, devil's walkingstick, devils walkingstick	Present in Park	Common
Arbacia punctulata	purple-spined sea urchin	Present in Park	No data
Archosargus probatocephalus	sheepshead	Present in Park	No data
Arctica islandica	ocean quahog	Present in Park	No data
Arctium minus	bardane, beggar's button, burdock, common burdock, lesser burdock, lesser burrdock, small burdock, smaller burdock, wild burdock, wild rhubarb	Present in Park	Unknown
Ardea herodias	Great Blue Heron	Present in Park	No data
Arenaria interpres	Ruddy Turnstone	Present in Park	No data
Arenaria interpres morinella	No data	No data	No data
Arenaria peploides	No data	NA	NA
Arenaria serpyllifolia	thymeleaf sandwort	Present in Park	Rare
Argopecten irradians concentricus	No data	Present in Park	No data

Argopecten irradians irradians	bay scallop	Present in Park	No data
Aristida dichotoma	churchmouse threeawn	Present in Park	Unknown
Aristida intermedia	No data	Present in Park	Unknown
Aristida longispica	slimspike threeawn	Present in Park	Uncommon
Aristida oligantha	Oldfield (Prairie) 3-awn, oldfield threeawn, prairie threeawn	Present in Park	Rare
Aristida purpurascens	arrowfeather threeawn	Present in Park	Uncommon
Aristida tuberculosa	seaside threeawn	Present in Park	Common
Aronia arbutifolia	red chokeberry	Present in Park	Uncommon
Aronia prunifolia	hybrid chokeberry	Present in Park	Uncommon
Artemisia ludoviciana	Louisiana sagewort, Louisiana wormwood, cudweed sagewort, gray sagewort, mugwort wormwood, prairie sage, white sagebrush	Present in Park	Rare
Artemisia stelleriana	oldwoman	Present in Park	Rare
Artemisia vulgaris	common wormwood, mugwort	Present in Park	Rare
Arthonia	No data	NA	NA
Arthraxon hispidus	hairy jointgrass, small carpgrass	Present in Park	Common
Arthraxon hispidus var. cryptatherus	No data	Present in Park	Unknown
Asclepias incarnata	rose milkweed, swamp milkweed	NA	NA
Asclepias incarnata ssp. pulchra	swamp milkweed	Present in Park	Rare
Asclepias incarnata var. pulchra	No data	NA	NA
Asclepias lanceolata	fewflower milkweed	Present in Park	Rare
Asclepias syriaca	broadleaf milkweed, common milkweed	Present in Park	Rare
Asclepias tuberosa	butterfly milkweed, butterflyweed	Present in Park	Rare
Ascyrum hypericoides	No data	Present in Park	Common
Ascyrum hypericoides var. multicaule	No data	Present in Park	Common
Ascyrum stans	No data	Present in Park	Rare
Asellus kenki	No data	Present in Park	No data
Asparagus officinalis	asparagus, garden asparagus, garden-asparagus	Present in Park	Rare
Aspicilia	No data	NA	NA
Asplenium platyneuron	ebony spleenwort	Present in Park	Rare
Astarte castanea	smooth astarte	Present in Park	No data
Aster dumosus	rice button aster	Present in Park	Rare
Aster dumosus var. coridifolius	No data	Present in Park	Rare
Aster ericoides	heath aster, white aster, white heath aster	Present in Park	Rare
Aster pilosus	white heath aster, white oldfield aster	Present in Park	Unknown
Aster pilosus var. demotus	white oldfield aster	Present in Park	Uncommon
Aster pilosus var. pilosus	white oldfield aster	Present in Park	Rare
Aster simplex var. ramosissimus	No data	Present in Park	Rare
Aster spectabilis	western showy aster	NA	NA
Aster subulatus	annual saltmarsh aster	NA	NA
Aster subulatus var. euroauster	annual saltmarsh aster	NA	NA
Aster subulatus var. subulatus	annual saltmarsh aster	Present in Park	Uncommon
Aster tenuifolius	saline aster	Present in Park	Uncommon
Asterias forbesi	No data	Present in Park	No data
Astroscopus guttatus	northern stargazer	Present in Park	No data
Atriplex arenaria	No data	Present in Park	Uncommon
Atriplex patula ssp. hastata	No data	NA	NA
Atriplex patula var. hastata	No data	Present in Park	Common
Atriplex pentandra	crested saltbush	NA	NA
Aulacomnium palustre	aulacomnium moss	Present in Park	Common
Aythya affinis	Lesser Scaup	Present in Park	No data
Aythya americana	Redhead	Present in Park	No data
Aythya collaris	Ring-necked Duck	Present in Park	No data

Aythya marila	Greater Scaup	Present in Park	No data
Aythya valisineria	Canvasback	Present in Park	No data
Baccharis halimifolia	eastern baccharis	Present in Park	Common
Bacopa monnieri	coastal waterhyssop, herb of grace, herb-of-grace	Present in Park	Rare
Bairdiella chrysoura	silver perch	Present in Park	No data
Balaenoptera acutorostrata	minke whale, northern minke whale	Present in Park	Rare
Balaenoptera borealis	sei whale	Present in Park	Rare
Balaenoptera musculus	blue whale	Present in Park	Rare
Balaenoptera physalus	fin whale, finback whale	Present in Park	Rare
Balistes capriscus	gray triggerfish	Present in Park	No data
Balistes vetula	queen triggerfish	Present in Park	No data
Baptisia tinctoria	horseflyweed, yellow wildindigo	Present in Park	Rare
Barbarea verna	early yellowrocket	Present in Park	Uncommon
Barbarea vulgaris	garden yellow rocket, garden yellow-rocket, garden yellowrocket, winter cress, yellow rocket	Present in Park	Uncommon
Barnea truncata	Atlantic mud-piddock, atlantic mud piddock	Present in Park	No data
Bartonia virginica	yellow screwstem	Present in Park	Rare
Bassia hirsuta	hairy smotherweed	Present in Park	Common
Berchemia scandens	Alabama supplejack	Present in Park	Rare
Bidens bipinnata	Spanish needles, spanish-needles	Present in Park	Rare
Bidens frondosa	bur marigold, devil's beggartick, devil's beggarticks, devil's bootjack, devil's-pitchfork, devils beggartick, pitchfork weed, sticktight, sticktights, tickseed sunflower	Present in Park	Rare
Bidens laevis	burmarigold, smooth beggartick, smooth beggarticks	Present in Park	Unknown
Bidens polylepis	No data	Present in Park	Common
Bidens tripartita	three-lobe beggarticks, threelobe beggarticks	Present in Park	Common
Boehmeria cylindrica	small-spike false nettle, smallspike false nettle, smallspike falsenettle	Present in Park	Unknown
Boehmeria cylindrica var. cylindrica	No data	Present in Park	Uncommon
Boehmeria cylindrica var. drummondiana	No data	Present in Park	Common
Borrichia frutescens	bushy seaoxeye, bushy seaside tansy	Present in Park	Rare
Bos taurus	aurochs, domestic cattle (feral), domesticated cattle	Present in Park	No data
Botrychium biternatum	sparselobe grapefern	Present in Park	Rare
Brachythecium rutabulum	brachythecium moss	Present in Park	Uncommon
Branta bernicla	Brant	Present in Park	Abundant
Branta canadensis	Canada Goose	Present in Park	Abundant
Brassica rapa	bird's rape, birdsrape mustard, field mustard, rape, rape mustard, turnip rape, wild mustard, wild rutabaga, wild turnip	Present in Park	Uncommon
Brevoortia tyrannus	Atlantic menhaden, bugfish, bunker, fatback, menhaden, mossbunker	Present in Park	No data
Briza minor	little quakinggrass	Present in Park	Rare
Bromus commutatus	hairy brome, hairy chess, meadow brome	NA	NA
Bromus japonicus	Japanese brome, Japanese bromegrass, Japanese chess	Present in Park	Uncommon
Bromus mollis	soft brome, soft cheat, soft chess	Present in Park	Unknown
Bromus racemosus	bald brome	Present in Park	Uncommon
Bromus racemosus var. commutatus	No data	Present in Park	Unknown
Bromus sterilis	barren bromegrass, poverty brome, sterile brome	Present in Park	Uncommon
Bromus tectorum	cheat grass, cheatgrass, downy brome, early chess, military grass, wild oats	Present in Park	Uncommon
Bryum caespiticium	dry calcareous bryum moss	Present in Park	Common
Bryum capillare	bryum moss	Present in Park	Common
Bryum pseudotriquetrum	common green bryum moss	Present in Park	Common
Bubulcus ibis	Cattle Egret	Present in Park	No data
Buccinum undatum	waved whelk	Present in Park	No data
Bucephala	Goldeneyes	Present in Park	No data
Bucephala albeola	Bufflehead	Present in Park	Abundant
Bucephala clangula	Common Goldeneye	Present in Park	No data
Buellia polyspora	No data	Present in Park	Abundant

Buellia stillingiana	No data	Present in Park	Uncommon
Bufo woodhousii	Woodhouse's Toad	Present in Park	Common
Bufo woodhousii fowleri	Fowler's Toad	Present in Park	No data
Bulbostylis capillaris	densetuft hairsedge, threadleaf beakseed	Present in Park	Common
Busycon canaliculatum	No data	Present in Park	No data
Busycon carica	knobbed whelk	Present in Park	No data
Busycon contrarium	No data	Present in Park	No data
Cakile edentula	American searocket	Present in Park	Abundant
Calamagrostis cinnoides	No data	Present in Park	Rare
Calidris	Stints	Present in Park	No data
Calidris alba	Sanderling	Present in Park	No data
Calidris alpina	Dunlin	Present in Park	No data
Calidris canutus	Red Knot	Present in Park	No data
Calidris canutus rufa	No data	No data	No data
Calidris fuscicollis	White-rumped Sandpiper	No data	No data
Calidris maritima	Purple Sandpiper	Present in Park	No data
Calidris mauri	Western Sandpiper	Present in Park	No data
Calidris melanotos	Pectoral Sandpiper	No data	No data
Calidris minutilla	Least Sandpiper	Present in Park	No data
Calidris pusilla	Semipalmated Sandpiper	Present in Park	No data
Callianassa atlantica	No data	Present in Park	No data
Callinectes sapidus	blue crab, bluepoint	Present in Park	No data
Callitriche heterophylla	differentleaf waterstarwort, greater water starwort, larger waterstarwort, twoheaded water-starwort, variedleaf waterstarwort	Present in Park	Rare
Calonectris diomedea	Cory's Shearwater	Present in Park	No data
Caloplaca	No data	NA	NA
Calystegia sepium	bearbind, devil's guts, hedge bindweed, hedge false bindweed, hedge falsebindweed, hedgebell, large bindweed, old man's night cap, wild morning glory	Present in Park	Common
Camassia scilloides	Atlantic camas	Present in Park	Rare
Campsis radicans	common trumpetcreeper, cow-itch, trumpet creeper	Present in Park	Common
Cancer irroratus	Atlantic rock crab	Present in Park	No data
Candelaria concolor	No data	Present in Park	Common
Canoparmelia caroliniana	No data	Present in Park	Abundant
Capra hircus	domestic goat, goat (feral)	Present in Park	No data
Capsella bursa-pastoris	shepardspurse, shepherd's purse, shepherd's-purse, shepherdspurse	Present in Park	Occasional
Caranx crysos	blue runner	Present in Park	No data
Caranx fusus	blue runner	Present in Park	No data
Caranx hippos	crevalle jack	Present in Park	No data
Caranx latus	horse-eye jack	Present in Park	No data
Carcharhinus milberti	No data	Unconfirmed	No data
Carcharhinus plumbeus	sandbar shark	Present in Park	No data
Carcharias taurus	sand tiger, sand tiger shark	Present in Park	No data
Carcinus maenas	green crab	Present in Park	No data
Cardamine hirsuta	hairy bittercress	Present in Park	Uncommon
Cardamine parviflora	sand bittercress, smallflowered bittercress	Present in Park	Uncommon
Cardamine parviflora var. arenicola	sand bittercress	Present in Park	Unknown
Caretta caretta	Loggerhead, loggerhead sea turtle	Present in Park	No data
Caretta caretta caretta	No data	Present in Park	No data
Carex albolutescens	greenwhite sedge	NA	NA
Carex emmonsii	No data	Present in Park	Rare
Carex extensa	longbract sedge	Present in Park	Rare
Carex hormathodes	marsh straw sedge	Present in Park	Common
Carex kobomugi	Japanese sedge	Present in Park	Uncommon

Carex laxiflora var. blanda	No data	Present in Park	Unknown
Carex longii	Long's sedge	Present in Park	Common
Carex lurida	shallow sedge	Present in Park	Rare
Carex muehlenbergii	Muhlenberg's sedge, muhlenberg's sedge	Present in Park	Unknown
Carex silicea	beach sedge	Present in Park	Uncommon
Carex straminea var. invisa	No data	NA	NA
Carex swanii	Swan's sedge, swan sedge	Present in Park	Unknown
Carpodacus purpureus	Purple Finch	Present in Park	No data
Casmerodius albus	Great Egret	Present in Park	No data
Cassia fasciculata	partridge pea, showy partridgepea, sleepingplant	Present in Park	Uncommon
Cassia nictitans	No data	NA	NA
Cassia nictitans nictitans	No data	Present in Park	Common
Cathartes aura	Turkey Vulture	Present in Park	No data
Catoptrophorus semipalmatus	Willet	Present in Park	No data
Catoptrophorus semipalmatus inornatus	No data	No data	No data
Catoptrophorus semipalmatus semipalmatus	No data	No data	No data
Celtis occidentalis	common hackberry, hackberry, western hackberry	Present in Park	Rare
Cenchrus tribuloides	sanddune sandbur	Present in Park	Abundant
Centaurea maculosa	spotted knapweed	Present in Park	Rare
Centaurium umbellatum	No data	Present in Park	Unknown
Centella erecta	erect centella	Present in Park	Common
Centrarchidae	sunfishes	Present in Park	No data
Centropristis striata	black sea bass	Present in Park	No data
Centrosema virginianum	butterflypea, spurred butterfly pea	Present in Park	Rare
Cephalanthus occidentalis	buttonbush, common buttonbush	Present in Park	Unknown
Cephalozia macrostachya	cephalozia	Present in Park	Common
Cerastium semidecandrum	fivestamen chickweed	Present in Park	Uncommon
Cerastium viscosum	No data	Present in Park	Uncommon
Cerastium vulgatum	big chickweed, mouseear chickweed	NA	NA
Ceratodon purpureus	ceratodon moss	Present in Park	Common
Cervus nippon	Sika deer	Present in Park	Common
Ceryle torquata	Ringed Kingfisher	No data	No data
Cetacea	cetaceans, dolphins, marine mammals, porpoises, whales	Present in Park	No data
Chaetodipterus faber	Atlantic spadefish	Present in Park	No data
Chaetodon ocellatus	spotfin butterflyfish	Present in Park	No data
Charadrius melodus	Piping Plover	Present in Park	No data
Charadrius melodus melodus	No data	No data	No data
Charadrius semipalmatus	Semipalmated Plover	Present in Park	No data
Charadrius vociferus	Killdeer	Present in Park	No data
Charadrius vociferus vociferus	No data	No data	No data
Charadrius wilsonia	Wilson's Plover	Present in Park	No data
Chasmanthium laxum	slender woodoats, spike uniola	Present in Park	Uncommon
Chasmodes bosquianus	striped blenny	Present in Park	No data
Chelonia mydas	Green Sea Turtle, common green sea turtle	Present in Park	No data
Chelonia mydas mydas	No data	Present in Park	No data
Chelydra serpentina	Snapping Turtle, common snapping turtle	Present in Park	Common
Chelydra serpentina serpentina	Common Snapping Turtle	Present in Park	No data
Chen caerulescens	Snow Goose	Present in Park	No data
Chenopodium album	common lambsquarters, lambsquarters, lambsquarters goosefoot, white goosefoot	NA	NA
Chenopodium ambrosioides	Mexican tea, Mexican-tea	Present in Park	Common
Chenopodium missouriense	No data	Present in Park	Common

Chilara taylori	spotted cusk-eel	Present in Park	No data
Chilomycterus schoepfi	burrfish, porcupinefish, striped burrfish	Present in Park	No data
Chimaphila maculata	striped prince's pine, striped prince's-pine	Present in Park	Rare
Chione cancellata	cross-barred venus	Present in Park	No data
Chlidonias niger	Black Tern	Present in Park	No data
Chloris verticillata	Tumble Windmillgrass, tumble windmill grass, windmillgrass	Present in Park	Rare
Chondrilla juncea	hogbite, rush skeletonweed, skeletonweed	Present in Park	Uncommon
Chrysanthemum leucanthemum	ox-eye daisy, oxeye daisy	Present in Park	Uncommon
Chrysaora quinquecirrha	sea nettle	Present in Park	No data
Chrysemys picta	Painted Turtle	Present in Park	Common
Chrysemys picta picta	Eastern Painted Turtle	Present in Park	No data
Chrysemys rubriventris	No data	Present in Park	No data
Chrysopsis graminifolia	No data	Present in Park	Rare
Chrysopsis nervosa	No data	Present in Park	Rare
Cichorium intybus	Common chicory, blue sailors, chicory, coffeeweed, succory	Present in Park	Uncommon
Cicindela dorsalis	Eastern Beach Tiger Beetle, northeastern beach tiger beetle	No data	No data
Cicuta maculata	common water hemlock, poison parsnip, spotted cowbane, spotted parsley, spotted water hemlock, spotted water-hemlock, spotted waterhemlock, water hemlock	Present in Park	Rare
Circus cyaneus	Northern Harrier	Present in Park	No data
Cirsium horridulum	yellow thistle	Present in Park	Uncommon
Cirsium vulgare	bull thistle, common thistle, spear thistle	Present in Park	Rare
Citrullus lanatus	watermelon	Present in Park	Rare
Cladium mariscoides	smooth sawgrass	Present in Park	Rare
Cladonia	No data	NA	NA
Cladonia cristatella	No data	Present in Park	Abundant
Cladonia floerkeana	No data	Present in Park	Common
Cladonia macilenta bacillaris	No data	Present in Park	Common
Cladonia parasitica	No data	Present in Park	Common
Cladonia rangiferina	No data	Present in Park	Unknown
Cladonia rappii	No data	Present in Park	Unknown
Cladonia santensis	No data	Present in Park	Common
Cladonia squamosa	No data	Present in Park	Unknown
Clangula hyemalis	Oldsquaw	Present in Park	No data
Clematis terniflora	leatherleaf clematis, sweet autumn virginsbower, yam-leaved clematis	Present in Park	Rare
Clemmys guttata	Spotted Turtle	Present in Park	No data
Clethra alnifolia	coastal sweetpepperbush, summersweet clethra	Present in Park	Rare
Climacia areolaris	No data	Present in Park	No data
Clitoria mariana	Atlantic pigeonwings, pidgeonwings	Unconfirmed	NA
Clupea harengus	Atlantic herring, Baltic herring, herring	Present in Park	No data
Clupea harengus harengus	Atlantic herring, herring	Present in Park	No data
Coccyzus americanus	Yellow-billed Cuckoo	No data	No data
Codakia orbicularis	tiger lucine	Present in Park	No data
Colaptes auratus	Northern Flicker	Present in Park	No data
Coluber constrictor	Racer	Present in Park	No data
Coluber constrictor constrictor	Northern Black Racer	Present in Park	No data
Commelina communis	Asiatic dayflower, common dayflower	Present in Park	Rare
Conger conger	conger eel, sea eel	Present in Park	No data
Conger oceanicus	conger eel	Present in Park	No data
Convolvulus sepium	hedge false bindweed	NA	NA
Conyza canadensis	Canada horseweed, Canadian horseweed, horseweed, horseweed fleabane, mares tail, marestail	NA	NA
Conyza canadensis var. canadensis	Canadian horseweed	Present in Park	Uncommon
Conyza canadensis var. pusilla	Canadian horseweed	Present in Park	Uncommon

Coragyps atratus	Black Vulture	Present in Park	No data
Corbicula manilensis	asian clam	Present in Park	No data
Coreopsis grandiflora	bigflower coreopsis, largeflower tickseed	Present in Park	Rare
Cornus florida	flowering dogwood	Present in Park	Rare
Corvus brachyrhynchos	American Crow	Present in Park	No data
Coryphaenidae	dolphinfishes, dolphins, dorados	No data	No data
Crangon septemspinosa	sand shrimp, sevenspine bay shrimp	Present in Park	No data
Crassinella lunulata	lunate crassinella	Present in Park	No data
Crassostrea virginica	eastern oyster	Present in Park	No data
Crataegus crus-galli	bush hawthorne, cockspur hawthorn	Present in Park	Uncommon
Crepidula convexa	convex slippersnail	Present in Park	No data
Crepidula fornicata	common Atlantic slippersnail	Present in Park	No data
Crepidula plana	eastern white slippersnail	Present in Park	No data
Croton glandulosus var. septentrionalis	vente conmigo	Present in Park	Rare
Crucibulum striatum	striate cup-and-saucer	Present in Park	No data
Cryptotis parva	bee shrew, least shrew, little short-tailed shrew, small short-tailed shrew	Present in Park	Uncommon
Cucurbita pepo var. melopepo	field pumpkin	Present in Park	Rare
Cuscuta gronovii	scaldweed	Present in Park	Unknown
Cuscuta pentagona	bush-clover dodder, field dodder, fiveangled dodder, lespedeza dodder	Present in Park	Rare
Cyclichthys spinosus	striped burrfish	Present in Park	No data
Cyclocardia borealis	northern cyclocardia	Present in Park	No data
Cygnus columbianus	Tundra Swan	Present in Park	No data
Cygnus olor	Mute Swan	Present in Park	No data
Cynodon dactylon	Bermudagrass, chiendent pied-de-poule, common bermudagrass, devilgrass, grama-seda, manienie, motie molulu	Present in Park	Uncommon
Cynoscion nebulosus	spotted seatrout	Present in Park	No data
Cynoscion regalis	gray trout, sea trout, weakfish	Present in Park	No data
Cyperus erythrorhizos	red-root flat sedge, redroot flatsedge, redroot nutgrass	Present in Park	Unknown
Cyperus esculentus	No data	Present in Park	Common
Cyperus filicinus	fern flatsedge	Present in Park	Common
Cyperus filiculmis	No data	NA	NA
Cyperus flavescens	pale flatsedge, yellow flatsedge	Present in Park	Common
Cyperus grayi	Gray's flatsedge	Present in Park	Common
Cyperus odoratus	fragrant flatsedge, rusty flat sedge	Present in Park	Common
Cyperus polystachyos var. texensis	Texan flatsedge	Unconfirmed	NA
Cyperus retrorsus	pine barren flatsedge	Present in Park	Common
Cyperus strigosus	strawcolored flatsedge, strawcolor flatsedge, strawcolor nutgrass, strawcolored flatsedge, strawcolored nutgrass	Present in Park	Common
Cyprinodon variegatus	sheepshead minnow, sheepshead pupfish	Present in Park	No data
Cyprinus carpio	European carp, common carp	Present in Park	No data
Cypripedium acaule	lady's-slipper orchid, moccasin flower, pink lady's slipper, pink lady's-slipper, pink lady's-slipper orchid, pink ladyslipper, pink moccasin flower	Present in Park	Rare
Cyrtopleura costata	angelwing	Present in Park	No data
Cystophora cristata	bladdernose seal, hooded seal	Present in Park	Rare
Dactylis glomerata	cocksfoot, orchard grass, orchardgrass	Present in Park	Uncommon
Dasyatis americana	southern stingray	Present in Park	No data
Datura stramonium	Jamestown weed, jimsonweed, mad apple, moonflower, stinkwort, thorn apple	Present in Park	Uncommon
Daucus carota	Queen Anne's lace, bird's nest, wild carrot	Present in Park	Uncommon
Delphinus delphis	common dolphin, saddle-backed dolphin, short-beaked common dolphin, short-beaked saddle-backed dolphin, short-beaked saddleback dolphin	Present in Park	Common
Dendroica coronata	Yellow-rumped Warbler	Present in Park	No data
Dendroica coronata coronata	No data	No data	No data
Dendroica palmarum palmarum	No data	No data	No data
Dendroica petechia amnicola	No data	No data	No data
Dendroica striata	Blackpoll Warbler	No data	No data

Dermochelys coriacea	Leatherback, leatherback sea turtle, leatherback turtle, tinglar	Present in Park	No data
Desmodium canescens	hoary tickclover, hoary ticktrefoil	Present in Park	Rare
Desmodium ciliare	hairy small-leaf ticktrefoil, littleleaf tickclover	Present in Park	Rare
Desmodium glabellum	Dillenius' ticktrefoil	Present in Park	Rare
Desmodium paniculatum	narrow-leaf tick-trefoil, panicled tickclover, panicledleaf ticktrefoil	Present in Park	Rare
Desmodium rigidum	No data	Present in Park	Rare
Desmodium sessilifolium	Sessile tickclover, sessileleaf tickclover, sessileleaf ticktrefoil	Present in Park	Rare
Diadophis punctatus edwardsii	Northern Ringneck Snake	Present in Park	No data
Diamesa nivoriunda	No data	Present in Park	No data
Dichanthelium acuminatum	hotsprings panicum, hotsprings rosette grass, tapered rosette grass	NA	NA
Dichanthelium acuminatum var. acuminatum	tapered rosette grass	Present in Park	Uncommon
Dichanthelium acuminatum var. implicatum	No data	Present in Park	Abundant
Dichanthelium acuminatum var. lindheimeri	Lindheimer panicgrass	Present in Park	Rare
Dichanthelium acuminatum var. villosum	No data	Present in Park	Common
Dichanthelium clandestinum	deertongue	Present in Park	Common
Dichanthelium depauperatum	starved panicgrass	Present in Park	Rare
Dichanthelium dichotomum	cypress panicgrass	NA	NA
Dichanthelium dichotomum var. dichotomum	cypress panicgrass	Present in Park	Rare
Dichanthelium scoparium	velvet panicum	Present in Park	Uncommon
Dichanthelium sphaerocarpon	roundseed panicgrass, roundseed panicum	Present in Park	Uncommon
Dicranum condensatum	condensed dicranum moss	Present in Park	Common
Dicranum flagellare	dicranum moss	Present in Park	Common
Dicranum scoparium	dicranum moss	Present in Park	Occasional
Didelphis marsupialis	No data	Present in Park	Common
Digitaria filiformis	slender crabgrass	Present in Park	Uncommon
Digitaria filiformis filiformis	No data	NA	NA
Digitaria ischaemum	small crabgrass, smooth crab grass, smooth crabgrass	Present in Park	Unknown
Digitaria sanguinalis	Crabgrass, hairy crab grass, hairy crabgrass, large crabgrass, purple crabgrass, redhair crabgrass	Present in Park	Uncommon
Dinocardium robustum	Atlantic giant cockle	Present in Park	No data
Diodia teres	poor joe, poorjoe, rough buttonweed	Present in Park	Rare
Diodia teres var. hystricina	poorjoe	Present in Park	Common
Diodia teres var. teres	poor joe, poor-joe, poorjoe	Present in Park	Uncommon
Diodia virginiana	Virginia buttonweed	Present in Park	Common
Diodora cayenensis	Cayenne keyhole limpet	Present in Park	No data
Diospyros virginiana	Persimmon, common persimmon, eastern persimmon	Present in Park	Uncommon
Distichlis spicata	desert saltgrass, inland saltgrass, marsh spikegrass, saltgrass, seashore saltgrass	Present in Park	Common
Divaricella quadrisulcata	cross-hatched lucine	Present in Park	No data
Donax variabilis	variable coquina	Present in Park	No data
Dorosoma cepedianum	American gizzard shad, eastern gizzard shad, gizzard shad, hickory shad, mud shad, skipjack	Present in Park	No data
Draba verna	spring Whitlowgrass, spring draba	Present in Park	Uncommon
Drosera intermedia	spoonleaf sundew	Present in Park	Uncommon
Dryopteris thelypteris	No data	NA	NA
Duchesnea indica	India mockstrawberry, Indian strawberry	Present in Park	Rare
Dumetella carolinensis	Gray Catbird	No data	No data
Echeneis naucrates	sharksucker	Present in Park	No data
Echinochloa crus-galli	Japanese millet, barnyard grass, barnyardgrass, cockspur, large barnyard grass, watergrass	NA	NA
Echinochloa crusgalli	No data	Present in Park	Rare
Echinochloa muricata	rough barnyard grass, rough barnyardgrass	Present in Park	Rare

Echinochloa pungens	No data	NA	NA
Echinochloa pungens var. microstachya	No data	NA	NA
Echinochloa walteri	coast cockspur, coast cockspur grass, walter's barnyard grass	Present in Park	Uncommon
Echinochloa walteri laevigata	No data	Present in Park	Uncommon
Eclipta alba	No data	Present in Park	Common
Eclipta prostrata	eclipta, false daisy, yerba de tago, yerba de tajo	Present in Park	Common
Ectocarpus	No data	NA	NA
Elaeagnus angustifolia	Russian olive, Russian-olive, oleaster	Present in Park	Unknown
Elaeagnus multiflora	cherry silverberry	Present in Park	Rare
Elaphe obsoleta	Rat Snake, Texas Ratsnake	Present in Park	No data
Elaphe obsoleta obsoleta	Black Rat Snake	Present in Park	No data
Eleocharis albida	white spikerush	Present in Park	Uncommon
Eleocharis halophila	saltmarsh spikerush	Present in Park	Rare
Eleocharis obtusa	blunt spikerush, blunt spikesedge	Present in Park	Rare
Eleocharis olivacea	bright green spikerush	Present in Park	Uncommon
Eleocharis palustris	common spikerush, creeping spikerush, spikesedge	Present in Park	Common
Eleocharis parvula	dwarf spikerush, dwarf spikesedge, little-head spike-rush, little-head spikerush	Present in Park	Common
Eleocharis quadrangulata	squarestem spikerush, squarestem spikesedge	Present in Park	Unknown
Eleocharis rostellata	beaked spike-rush, beaked spikerush, beaked spikesedge	Present in Park	Common
Eleocharis tuberculosa	cone-cup spikerush	Present in Park	Rare
Elephantopus nudatus	naked elephantfoot, smooth elephantsfoot	Present in Park	Common
Elephantopus tomentosus	devil's grandmother, hairy elephantfoot	NA	NA
Eleusine indica	Indian goose grass, Indian goosegrass, crowsfoot grass, goose grass, goosegrass, manienie ali'I, silver crabgrass, wiregrass	Present in Park	Uncommon
Elops saurus	ladyfish	Present in Park	No data
Elymus virginicus	Virginia wild rye, Virginia wildrye	Present in Park	Unknown
Elymus virginicus var. halophilus	Virginia wildrye	Present in Park	Common
Enneacanthus gloriosus	bluespotted sunfish	Present in Park	No data
Ensis	No data	Present in Park	No data
Ensis directus	Atlantic jackknife, atlantic jackknife clam	Present in Park	No data
Enteromorpha	No data	NA	NA
Enteromorpha plumosa	No data	Present in Park	Unknown
Entodon seductrix	seductive entodon moss	Present in Park	Uncommon
Ephippus lippei	No data	Present in Park	No data
Epilobium coloratum	purple-leaf willowherb, purpleleaf willowherb, willowweed	Present in Park	Rare
Epitonium angulatum	angulate wentletrap	Present in Park	No data
Epitonium humphreysii	No data	Present in Park	No data
Epitonium rupicola	brown-band wentletrap	Present in Park	No data
Equisetum arvense	field horsetail, scouring rush, western horsetail	Historic	NA
Equus caballus	horse, horse (feral)	Present in Park	Common
Eragrostis	lovegrass, lovegrass spp.	NA	NA
Eragrostis capillaris	lace grass, lacegrass	Present in Park	Unknown
Eragrostis cilianensis	candy grass, lovegrass, stink grass, stinkgrass, strongscented lovegrass	Present in Park	Rare
Eragrostis curvula	weeping lovegrass	Present in Park	Common
Eragrostis pectinacea	purple love grass, purple lovegrass, spreading lovegrass, tufted lovegrass	Present in Park	Uncommon
Eragrostis refracta	coastal lovegrass	Present in Park	Common
Eragrostis spectabilis	petticoat-climber, purple lovegrass	Present in Park	Common
Erechtites hieracifolia	burnweed	NA	NA
Erechtites hieraciifolia	American burnweed	Present in Park	Common
Erianthus giganteus	No data	NA	NA
Erigeron annuus	annual fleabane, eastern daisy fleabane	Present in Park	Rare
Erigeron canadensis	No data	NA	NA

Erigeron philadelphicus	Philadelphia daisy, Philadelphia fleabane	Present in Park	Rare
Erigeron strigosus	Daisy Fleabane, prairie fleabane, rough fleabane	Present in Park	Rare
Erigeron strigosus var. strigosus	prairie fleabane	NA	NA
Erodium cicutarium	California filaree, alfilaree, alfilaria, cutleaf filaree, filaree, red-stem stork's-bill, redstem, redstem filaree, redstem stork's bill, stork's bill, storksbill	Present in Park	Uncommon
Eromophila alpestris	No data	Present in Park	No data
Esox americanus	grass pickerel, redfin or grass pickerel, redfin pickerel	Present in Park	No data
Esox niger	chain pickerel	Present in Park	No data
Etheostoma blennioides	greenside darter	Present in Park	No data
Etropus microstomus	smallmouth flounder	Present in Park	No data
Eubalaena glacialis	black right whale, northern right whale	Present in Park	Rare
Eucinostomus argenteus	spotfin mojarra	Present in Park	No data
Eukiefferiella devonica	No data	Present in Park	No data
Eupatorium album	white thoroughwort	Present in Park	Rare
Eupatorium capillifolium	dogfennel	Present in Park	Uncommon
Eupatorium hyssopifolium var. hyssopifolium	hyssopleaf thoroughwort	Present in Park	Common
Eupatorium hyssopifolium var. laciniatum	hyssopleaf thoroughwort	Present in Park	Uncommon
Eupatorium leucolepis	justiceweed	Present in Park	Rare
Eupatorium leucolepis var. leucolepis	justiceweed	Present in Park	Uncommon
Eupatorium pilosum	rough boneset	NA	NA
Eupatorium pubescens	No data	NA	NA
Eupatorium rotundifolium	roundleaf eupatorium, roundleaf thoroughwort	NA	NA
Eupatorium rotundifolium ssp. ovatum	No data	NA	NA
Eupatorium rotundifolium var. ovatum	roundleaf thoroughwort	Present in Park	Rare
Eupatorium rotundifolium var. rotundifolium	roundleaf thoroughwort	Present in Park	Common
Eupatorium rotundifolium var. saundersii	No data	Present in Park	Uncommon
Eupatorium rugosum	richweed, snakeroot, white snakeroot	NA	NA
Eupatorium serotinum	late eupatorium, lateflowering thoroughwort	Present in Park	Uncommon
Euphorbia maculata	No data	Present in Park	Common
Euphorbia nutans	eyebane	Present in Park	Uncommon
Euphorbia polygonifolia	No data	Present in Park	Common
Euphorbia supina	No data	Present in Park	Rare
Eupleura caudata	thick-lip drill	Present in Park	No data
Euthamia graminifolia	flat-top goldentop, flattop goldentop	Present in Park	Uncommon
Euthamia tenuifolia	slender goldentop	Present in Park	Common
Falco columbarius	Merlin	Present in Park	No data
Falco peregrinus	Peregrine Falcon	Present in Park	No data
Falco sparverius	American Kestrel	Present in Park	No data
Favella	No data	Present in Park	No data
Festuca arundinacea	Alta fescue, coarse fescue, reed fescue, tall fescue	Present in Park	Common
Festuca ovina	No data	Unconfirmed	NA
Festuca ovina var. duriuscula	No data	NA	NA
Festuca pratensis	No data	Present in Park	Rare
Festuca rubra	ravine fescue, red fescue	Present in Park	Common
Fimbristylis autumnalis	slender fimbry	Present in Park	Common
Fimbristylis caroliniana	Carolina fimbry	Present in Park	Rare
Fimbristylis castanea	marsh fimbry, saltmarsh fimbristylis	Present in Park	Common
Fistularia tabacaria	bluespotted cornetfish, tobacco trumpetfish	Present in Park	No data
Flavoparmelia caperata	No data	Present in Park	Common
Fragaria virginiana	Virginia strawberry, thickleaved wild strawberry, wild strawberry	Present in Park	Rare

Froelichia floridana	Florida snakecotton, cottonweed, field snakecotton, plains snakecotton, prairie froelichia	Present in Park	Rare
Froelichia gracilis	slender snake-cotton, slender snakecotton	Present in Park	Rare
Frullania eboracensis	No data	Present in Park	Uncommon
Fucus vesiculosus	No data	Present in Park	Unknown
Fuirena pumila	dwarf umbrella-sedge, dwarf umbrellasedge	Present in Park	Uncommon
Fulica americana	American Coot	No data	No data
Fundulus	topminnows	Present in Park	No data
Fundulus diaphanus	banded killifish	Present in Park	No data
Fundulus heteroclitus	mummichog	Present in Park	No data
Fundulus luciae	spotfin killifish	Present in Park	No data
Fundulus majalis	striped killifish	Present in Park	No data
Gadus morhua	Atlantic cod, cod, rock cod	Present in Park	No data
Gaillardia pulchella	Indian blanket, Indianblanket, firewheel, rosering gaillardia	Present in Park	Rare
Galium aparine	bedstraw, catchweed bedstraw, cleavers, cleaverwort, goose grass, scarthgrass, sticky-willy, stickywilly, white hedge	Present in Park	Rare
Galium hispidulum	coastal bedstraw	Present in Park	Rare
Galium mollugo	false baby's breath	Present in Park	Rare
Galium obtusum	blunt-leaf bedstraw, bluntleaf bedstraw, bristly bedstraw	Present in Park	Common
Galium obtusum var. floridanum	No data	Present in Park	Unknown
Galium parisiense	wall bedstraw	NA	NA
Galium pilosum	hairy bedstraw	Present in Park	Rare
Gambusia affinis	mosquitofish, western mosquitofish	Present in Park	No data
Gambusia holbrooki	eastern mosquitofish	Present in Park	No data
Gasterosteus aculeatus	Alaskan stickleback, threespine stickleback	Present in Park	No data
Gavia arctica	Arctic Loon	Present in Park	No data
Gavia immer	Common Loon	Present in Park	No data
Gavia stellata	Red-throated Loon	Present in Park	No data
Gaylussacia baccata	black huckleberry	Present in Park	Rare
Gemma gemma	amethyst gemclam	Present in Park	No data
Geothlypis trichas trichas	No data	No data	No data
Geranium carolinianum	Carolina crane's-bill, Carolina geranium	Present in Park	Common
Geranium molle	awnless geranium, dovefoot geranium	Present in Park	Uncommon
Gerardia maritima	No data	NA	NA
Gerardia purpurea	No data	NA	NA
Geukensia demissa	ribbed mussel, ribbed-mussel	Present in Park	No data
Geum canadense	white avens	Historic	NA
Girella cyanea	bluefish	Present in Park	No data
Glecoma hederacea	No data	Present in Park	Rare
Globicephala macrorhynchus	short-finned pilot whale	Present in Park	No data
Globicephala melaena	long-finned pilot whale	Present in Park	Rare
Globicephala melas	long-finned pilot whale	No data	No data
Glyceria pallida	No data	NA	NA
Glyceria septentrionalis	floating mannagrass	Present in Park	Rare
Gnaphalium chilense	No data	Present in Park	Unknown
Gnaphalium obtusifolium	No data	Present in Park	Uncommon
Gnaphalium purpureum var. americanum	No data	Present in Park	Uncommon
Gnaphalium purpureum var. falcatum	No data	NA	NA
Gnaphalium purpureum var. purpureum	No data	Present in Park	Unknown
Gobiesox strumosus	skilletfish	Present in Park	No data
Gobiosoma bosc	naked goby	Present in Park	No data
Gobiosoma ginsburgi	seaboard goby	Present in Park	No data
Gobiosoma molestum	naked goby	Present in Park	No data

Grampus griseus	Risso's dolphin, grampus	Present in Park	Rare
Graphina	No data	NA	NA
Graphis	No data	Present in Park	No data
Graphis	No data	NA	NA
Gratiola pilosa	shaggy hedgehyssop	Present in Park	Unknown
Grinnellia americana	No data	Present in Park	Unknown
Gymnopogon brevifolius	shortleaf skeletongrass	Present in Park	Rare
Gymnura micrura	smooth butterfly ray	Present in Park	No data
Habenaria cristata	No data	Present in Park	Rare
Haematopus bachmani	Black Oystercatcher	Present in Park	No data
Haliaeetus leucocephalus	Bald Eagle	Present in Park	No data
Halichoerus grypus	Atlantic gray seal, Atlantic seal, Baltic gray seal, gray seal, horsehead	Present in Park	Rare
Haminoea solitaria	solitary glassy-bubble	Present in Park	No data
Hedera helix	English ivy	Present in Park	Unknown
Helenium amarum	bitter sneezeweed, yellowdicks	Present in Park	Unknown
Helianthemum canadense	canada frostweed, longbranch frostweed	Present in Park	Rare
Helianthus giganteus	giant sunflower	Present in Park	Unknown
Helianthus petiolaris ssp. petiolaris	prairie sunflower	Present in Park	Rare
Heliotropium curassavicum	quail plant, salt heliotrope, seaside heliotrope	Present in Park	Unknown
Hemerocallis fulva	orange day lily, orange daylily, tawny daylily	Present in Park	Rare
Hemigrapsus sanguineus	No data	Present in Park	No data
Hemiaria cinerea	No data	NA	NA
Hemiaria hirsuta	hairy rupturewort	Present in Park	Rare
Heterodermia granuifera	No data	Present in Park	Common
Heterodon platirhinos	Eastern Hog-nosed Snake	Present in Park	No data
Heterodon platyrhinos	No data	Present in Park	No data
Heterotheca subaxillaris	camphorweed, golden aster	Present in Park	Uncommon
Hibiscus moscheutos	crimsoneyed rosemallow, swamp rosemallow	NA	NA
Hibiscus moscheutos ssp. moscheutos	crimsoneyed rosemallow	Present in Park	Common
Hibiscus palustris	No data	Present in Park	Rare
Hibiscus palustris f. peckii	No data	Present in Park	Unknown
Hieracium caespitosum	meadow hawkweed, yellow hawkweed	Present in Park	Rare
Hieracium florentinum	No data	NA	NA
Hieracium gronovii	Gronovis hawkweed, queendevil	Present in Park	Common
Hieracium piloselloides	tall hawkweed	Present in Park	Rare
Hieracium pratense	field hawkweed, meadow hawkweed, yellow hawkweed, yellow kingdevil	NA	NA
Hippa talpoida	No data	Present in Park	No data
Hippocampus erectus	lined seahorse, spotted seahorse	Present in Park	No data
Hippocampus hudsonius	No data	Present in Park	No data
Hirundo rustica	Barn Swallow	Present in Park	No data
Holcus lanatus	Yorkshire fog, common velvetgrass, velvetgrass	Present in Park	Common
Holosteum umbellatum	jagged chickweed	Present in Park	Rare
Honckenya peploides	seaside sandplant	Present in Park	Rare
Hordeum pusillum	little barley, little wildbarley	Present in Park	Uncommon
Houstonia nigricans	No data	NA	NA
Houstonia purpurea	Venus' pride, purple bluets	Unconfirmed	NA
Hudsonia tomentosa	sand golden-heather, sand-heather, woolly beachheather	Present in Park	Common
Hydrobiidae	No data	Present in Park	No data
Hydrocotyle umbellata	manyflower marshpennywort, umbrella pennyroyal	Present in Park	Uncommon
Hydrocotyle verticillata	whorled marsh pennywort, whorled marshpennywort, whorled pennyroyal	Present in Park	Rare
Hydrocotyle verticillata var. verticillata	whorled marsh pennywort, whorled marshpennywort	NA	NA

Hyla cinerea	Green Tree Frog, Green Treefrog	Present in Park	Common
Hypericum boreale	northern St. Johnswort	NA	NA
Hypericum canadense	lesser Canadian St. Johnswort	Present in Park	Rare
Hypericum gentianoides	orangegrass, pinweed st. johnswort	Present in Park	Uncommon
Hypericum gymnanthum	claspingleaf St. Johnswort	Historic	NA
Hypericum hypericoides var. multicaule	No data	Present in Park	Unknown
Hypericum mutilum	dwarf St. Johnswort	Present in Park	Common
Hypericum perforatum	Klamath weed, Klamathweed, St. John's wort, St. Johnswort, common St Johnswort, common St. John's wort, common St. Johnswort	Present in Park	Rare
Hypericum stans	No data	Present in Park	Unknown
Hypericum virginicum	No data	Present in Park	Uncommon
Hypochaeris radicata	common cat's-ear, false dandelion, frogbit, gosmore, hairy cat's ear, hairy catsear, spotted catsear	Present in Park	Uncommon
Hyporhamphus	halfbeaks	Present in Park	No data
Hyporhamphus unifasciatus	Atlantic silverstripe halfbeak, halfbeak, silverstripe halfbeak	Present in Park	No data
Hypoxis hirsuta	common goldstar, eastern yellow star-grass	Historic	NA
Hypsoblennius hentz	feather blenny	Present in Park	No data
Ictalurus catus	white bullhead, white catfish	Present in Park	No data
Ictalurus nebulosus	brown bullhead	Present in Park	No data
Ilex glabra	inberry, inkberry	Present in Park	Common
Ilex illacebrosus	No data	Present in Park	No data
Ilex opaca	American holly	Present in Park	Common
Ilyanassa obsoleta	eastern mudsnail	Present in Park	No data
Impatiens capensis	jewelweed, spotted touch-me-not	Present in Park	Unknown
Inodrillia dalli	No data	Present in Park	No data
Ipomoea hederacea	No data	Present in Park	Uncommon
Ipomoea lacunosa	pitted morningglory, white morninglory, whitestar	Present in Park	Rare
Iris versicolor	harlequin blueflag	Present in Park	Unknown
Ischadium recurvum	hooked mussel	Present in Park	No data
Isopterygium tenerum	isopterygium moss	Present in Park	Common
Iva frutescens	Jesuit's bark, bigleaf sumpweed	Present in Park	Common
Juglans nigra	black walnut	Present in Park	Rare
Juncus acuminatus	sharp-fruit rush, tapertip rush	Present in Park	Common
Juncus biflorus	bog rush	NA	NA
Juncus bufonius	toad rush	Present in Park	Common
Juncus canadensis	Canadian rush	Present in Park	Rare
Juncus coriaceus	leathery rush	Present in Park	Uncommon
Juncus dichotomus	forked rush	Present in Park	Abundant
Juncus dichotomus var. platyphyllus	No data	NA	NA
Juncus effusus	common rush, lamp rush	Present in Park	Rare
Juncus effusus var. solutus	lamp rush	Probably Present	NA
Juncus gerardii	saltmarsh rush, saltmeadow rush	Present in Park	Common
Juncus marginatus	grassleaf rush	Present in Park	Uncommon
Juncus marginatus var. biflorus	No data	NA	NA
Juncus platyphyllus	No data	Present in Park	Rare
Juncus roemerianus	needlegrass rush	Present in Park	Common
Juncus scirpoides	needlepod rush	Present in Park	Common
Juncus scirpoides var. compositus	No data	NA	NA
Juncus tenuis	field rush, path rush, poverty rush, slender rush, slender yard rush, wiregrass	Present in Park	Common
Juncus torreyi	Torrey's rush, torrey rush	Historic	NA
Juniperus virginiana	eastern red-cedar, eastern redcedar, red cedar juniper	Present in Park	Uncommon
Kickxia elatine	cancerwort, fluvellin, roundleaf fluvellin, sharpleaf cancerwort, sharpoint fluevellin, sharppoint fluvellin	Present in Park	Rare
Kinosternon subrubrum	Eastern Mud Turtle, common mud turtle	Present in Park	No data

Kinosternon subrubrum subrubrum	eastern mud turtle	Present in Park	No data
Kogia breviceps	pygmy sperm whale	Present in Park	Rare
Kogia sima	dwarf sperm whale	Present in Park	No data
Kosteletzkya virginica	Virginia saltmarsh mallow, Virginia saltmarsh willow	Present in Park	Common
Krigia virginica	Virginia dwarfdandelion	Present in Park	Common
Kyllinga gracillima	pasture spikesedge	Present in Park	Rare
Lactophrys trigonus	trunkfish	Present in Park	No data
Lactuca canadensis	Canada lettuce, Florida blue lettuce, wild lettuce	Present in Park	Unknown
Lactuca canadensis var. latifolia	Canada lettuce	Present in Park	Uncommon
Lactuca canadensis var. longifolia	Canada lettuce	Present in Park	Rare
Lactuca canadensis var. obovata	Canada lettuce	Present in Park	Rare
Lactuca scariola	No data	NA	NA
Lactuca serriola	China lettuce, prickly lettuce, wild lettuce	Present in Park	Rare
Lagenorhynchus acutus	Atlantic white-sided dolphin	Present in Park	Uncommon
Lagodon rhomboides	pinfish	Present in Park	No data
Lamium amplexicaule	common henbit, giraffehead, henbit, henbit deadnettle	Present in Park	Uncommon
Lampropeltis getula getula	Eastern Kingsnake	Present in Park	No data
Larimus fasciatus	banded drum	Present in Park	No data
Larus argentatus	Herring Gull	Present in Park	No data
Larus argentatus smithsonianus	No data	No data	No data
Larus atricilla	Laughing Gull	Present in Park	No data
Larus delawarensis	Ring-billed Gull	Present in Park	No data
Larus fuscus	Lesser Black-backed Gull	Present in Park	No data
Larus fuscus graellsii	No data	No data	No data
Larus hyperboreus	Glaucous Gull	Present in Park	No data
Larus marinus	Great Black-backed Gull	Present in Park	No data
Larus philadelphia	Bonaparte's Gull	Present in Park	No data
Larus ridibundus	Black-headed Gull, Common Black-headed Gull	Present in Park	No data
Larus tridactyla	Black-legged Kittiwake	Present in Park	No data
Lasionycteris noctivagans	silver-haired bat	Present in Park	Common
Lasiurus borealis	eastern red bat, red bat	Present in Park	Common
Laterallus jamaicensis	Black Rail	No data	No data
Lecanora caesiorubella caesiorubella	No data	Present in Park	Abundant
Lecanora dispersa	No data	NA	NA
Lecanora hybocarpa	No data	Present in Park	Common
Lecanora strobilina	No data	Present in Park	Abundant
Lechea leggettii	No data	NA	NA
Lechea maritima	beach pinweed	Present in Park	Uncommon
Lechea maritima var. virginica	Virginia pinweed	Present in Park	Common
Lechea pulchella	Leggett's pinweed	Present in Park	Rare
Leersia virginica	white grass, whitegrass	Present in Park	Rare
Leiostomus xanthurus	spot	Present in Park	No data
Lemna minor	common duckweed, least duckweed, lesser duckweed	Present in Park	Common
Lepas anatifera	duck barnacle	Present in Park	No data
Lepidium campestre	cream-anther field pepperwort, field pepperweed	Present in Park	Uncommon
Lepidium virginicum	Virginia pepperweed, Virginian peppercress, peppergrass, poorman pepperweed, poorman's pepper, poorman's-pepperwort	Present in Park	Common
Lepidochelys kempi	No data	Present in Park	No data
Lepomis gibbosus	kiver, pumpkinseed	Present in Park	No data
Lepomis macrochirus	bluegill	Present in Park	No data
Lepraria	No data	NA	NA
Lepraria lobificans	No data	Present in Park	Common

Leptobryum pyriforme	leptobryum moss	Present in Park	Uncommon
Leptochloa fascicularis	bearded sprangletop, sprangletop	NA	NA
Leptochloa fascicularis var. maritima	bearded sprangletop	Present in Park	Uncommon
Leptochloa filiformis	No data	NA	NA
Lespedeza capitata	roundhead lespedeza	Probably Present	NA
Lespedeza cuneata	Chinese lespedeza, sericea lespedeza	Present in Park	Common
Lespedeza hirta	hairy lespedeza	NA	NA
Lespedeza procumbens	trailing lespedeza	Present in Park	Rare
Lespedeza repens	creeping lespedeza	Present in Park	Rare
Lespedeza stipulacea	No data	Present in Park	Rare
Lespedeza striata	No data	Present in Park	Rare
Lespedeza violacea	violet lespedeza	Present in Park	Unknown
Leucobryum albidum	leucobryum moss	Present in Park	Common
Leucobryum glaucum	leucobryum moss	Present in Park	Uncommon
Libinia dubia	longnose spider crab	No data	No data
Libinia emarginata	portly spider crab	Present in Park	No data
Ligustrum vulgare	European privet, wild privet	Present in Park	Rare
Limnodromus	Dowitchers	Present in Park	No data
Limnodromus griseus	Short-billed Dowitcher	No data	No data
Limnodromus griseus griseus	No data	No data	No data
Limonium carolinianum	Carolina sea-lavender, Carolina sealavender	Present in Park	Rare
Limonium nashii	No data	NA	NA
Limonium nashii var. trichogonum	No data	Present in Park	Common
Limosa	Godwits	Present in Park	No data
Limosa fedoa	Marbled Godwit	Present in Park	No data
Limosa haemastica	Hudsonian Godwit	No data	No data
Limulus polyphemus	No data	Present in Park	No data
Linaria canadensis	Canada toadflax	Present in Park	Abundant
Lindernia anagallidea	No data	Present in Park	Uncommon
Lindernia dubia var. anagallidea	false pimpernel, falsepimpernel, yellow-seed false pimpernel, yellowseed false pimpernel	NA	NA
Linum medium	stiff yellow flax	Present in Park	Common
Linum virginianum	woodland flax	NA	NA
Lippia lanceolata	No data	NA	NA
Liquidambar styraciflua	sweetgum	Present in Park	Common
Liriodendron tulipifera	tulip poplar, tuliptree, yellow poplar, yellow-poplar	Present in Park	Uncommon
Listera australis	southern twayblade	Present in Park	Rare
Littorina irrorata	marsh periwinkle	Present in Park	No data
Littorina littorea	common periwinkle	Present in Park	No data
Liza tricuspidens	striped mullet	Present in Park	No data
Lobelia cardinalis	Cardinal flower, cardinalflower	Present in Park	Rare
Lobelia siphilitica	great blue lobelia	Unconfirmed	NA
Loligo pealeii	longfin inshore squid	Present in Park	No data
Lolium multiflorum	Italian ryegrass, annual ryegrass	NA	NA
Lolium perenne	italian ryegrass, perennial rye grass, perennial ryegrass	Present in Park	Uncommon
Lonicera japonica	Chinese honeysuckle, Japanese honeysuckle	Present in Park	Common
Lonicera sempervirens	trumpet honeysuckle	Present in Park	Uncommon
Lophocolea minor	No data	Present in Park	Common
Lophodytes cucullatus	Hooded Merganser	Present in Park	No data
Lophopsetta maculata	No data	Present in Park	No data
Lucania parva	rainwater killifish	Present in Park	No data
Ludwigia alternifolia	bushy seedbox, seedbox	Present in Park	Uncommon

Ludwigia palustris var. americana	No data	Present in Park	Common
Lunaria annua	annual honesty	Present in Park	Rare
Lunatia triseriata	No data	Present in Park	No data
Lutjanus campechanus	northern red snapper, red snapper	Present in Park	No data
Lutjanus gibbus	humpback red snapper, paddletail, red snapper	Present in Park	No data
Lutra canadensis	river otter	Present in Park	Uncommon
Luxilus cornutus	common shiner	Present in Park	No data
Lychnis alba	white cockle	Present in Park	Rare
Lycopersicon esculentum	garden tomato	Historic	NA
Lycopersicon lycopersicum	No data	NA	NA
Lycopodium appressum	No data	Present in Park	Uncommon
Lycopodium inundatum var. bigelovii	No data	False Report	NA
Lycopus americanus	American bugleweed, American water horehound, American waterhorehound, cut-leaf water-horehound, water horehound, waterhorehound	Present in Park	Common
Lycopus rubellus	taperleaf bugleweed, taperleaf water horehound	NA	NA
Lythrum lineare	wand lythrum	Present in Park	Abundant
Lythrum salicaria	purple loosestrife, purple loosestrife or lythrum, purple lythrum, rainbow weed, salicaire, spiked loosestrife	Present in Park	Occasional
Macoma balthica	Baltic macoma	Present in Park	No data
Magnolia grandiflora	southern magnolia	Present in Park	Rare
Magnolia virginiana	sweetbay	Present in Park	Uncommon
Malaclemys	Diamondback Terrapins	Present in Park	No data
Malaclemys terrapin	Diamondback Terrapin	Present in Park	Common
Malaclemys terrapin terrapin	Northern Diamondback Terrapin	Present in Park	No data
Malus angustifolia	southern crabapple	Present in Park	Unknown
Marginella roscida	seaboard marginella	Present in Park	No data
Martesia cuneiformis	wedge piddock, wedge-shaped piddock	Present in Park	No data
Matricaria matricarioides	disc mayweed, pineappleweed	Present in Park	Rare
Medicago lupulina	black medic, black medic clover, black medick, hop clover, hop medic, nonesuch, yellow trefoil	Present in Park	Rare
Megaptera novaeangliae	humpback whale	Present in Park	Rare
Melampus bidentatus	eastern melampus	Present in Park	No data
Melampus cinera	No data	Present in Park	No data
Melanella intermedia	No data	Present in Park	No data
Melanitta fusca	White-winged Scoter	Present in Park	No data
Melanitta nigra	Black Scoter	Present in Park	Abundant
Melanitta perspicillata	Surf Scoter	Present in Park	Abundant
Melilotus alba	white sweetclover	Present in Park	Uncommon
Melilotus officinalis	yellow sweet-clover, yellow sweetclover	Present in Park	Rare
Mellita testudinata	No data	Present in Park	No data
Melospiza melodia	Song Sparrow	Present in Park	No data
Membras martinica	rough silverside	Present in Park	No data
Menidia beryllina	inland silverside, tidewater silverside	Present in Park	No data
Menidia menidia	Atlantic silverside	Present in Park	No data
Mentha arvensis	wild mint	Present in Park	Unknown
Menticirrhus saxatilis	Gulf minkfish, northern kingfish	Present in Park	No data
Mercenaria mercenaria	northern quahog	Present in Park	No data
Mergus merganser	Common Merganser	Present in Park	No data
Mergus serrator	Red-breasted Merganser	Present in Park	No data
Merluccius bilinearis	silver hake	Present in Park	No data
Mesoplodon mirus	True's beaked whale	Present in Park	Rare
Microgobius thalassinus	green goby	Present in Park	No data
Micropogon undulatus	No data	Present in Park	No data
Micropogonias undulatus	Atlantic croaker	Present in Park	No data

Micropterus salmoides	largemouth bass	Present in Park	No data
Microstomus microcephalus	smallmouth flounder	Present in Park	No data
Microtus pennsylvanicus	meadow vole	Present in Park	Common
Mikania scandens	climbing hempvine, climbing hempweed	Present in Park	Common
Mirabilis jalapa	common four o'clock, common four-o'clock, marvel of Peru, marvel-of-Peru	Present in Park	Rare
Miscanthus sinensis	Chinese silvergrass, eulalia	Present in Park	Rare
Mitchella repens	partridgeberry	Present in Park	Rare
Mitrella lunata	lunar dovesnail	Present in Park	No data
Modiolus demissus	No data	Present in Park	No data
Molanna	No data	Present in Park	No data
Molgula	No data	Present in Park	No data
Molgula manhattensis	No data	Present in Park	No data
Mollugo verticillata	carpetweed, green carpetweed	Present in Park	Common
Molothrus ater	Brown-headed Cowbird	Present in Park	No data
Monacanthus hispidus	planehead filefish	Present in Park	No data
Monarda fistulosa	Oswego-tea, mintleaf beebalm, wild bergamot, wildbergamot beebalm, wildbergamot horsemint	Present in Park	Rare
Monarda punctata	spotted beebalm	Present in Park	Unknown
Monarda punctata ssp. punctata	spotted beebalm	Present in Park	Common
Monarda punctata var. villicaulis	spotted beebalm	NA	NA
Monotropa hypopithys	many-flower Indian-pipe, pinesap	Probably Present	NA
Monotropa uniflora	Indianpipe, one-flower Indian-pipe	Present in Park	Rare
Morone americana	white perch	Present in Park	No data
Morone saxatilis	rockfish, striped bass	Present in Park	No data
Morus alba	mulberry, white mulberry	Present in Park	Rare
Morus bassanus	Northern Gannet	Present in Park	Uncommon
Moxostoma macrolepidotum	shorthead redhorse	Present in Park	No data
Mugil cephalus	black mullet, gray mullet, striped mullet	Present in Park	No data
Mugil curema	silver mullet, white mullet	Present in Park	No data
Muhlenbergia schreberi	nimblewill, nimblewill muhly	Present in Park	Rare
Muhlenbergia schreberi var. palustris	No data	Present in Park	Rare
Mulinia lateralis	dwarf surfclam	Present in Park	No data
Mus musculus	house mouse	Present in Park	Common
Mus musculus domesticus	long-tailed house mouse	No data	No data
Mustela frenata	long-tailed weasel	Present in Park	Rare
Mustelus canis	dusky smooth-hound, smooth dogfish	Present in Park	No data
Mya arenaria	softshell, softshell clam	Present in Park	No data
Mya truncata	truncate softshell, truncate softshell clam	Present in Park	No data
Mycteroperca microlepis	charcoal belly, gag	Present in Park	No data
Myiarchus crinitus	Great Crested Flycatcher	No data	No data
Myliobatis freminvillei	bullnose ray	Present in Park	No data
Myocastor coypus	coypu, nutria	Present in Park	No data
Myosotis micrantha	No data	Present in Park	Rare
Myotis lucifugus	little brown bat, little brown myotis	Present in Park	Common
Myrica	sweetgale	NA	NA
Myrica cerifera	southern bayberry, wax myrtle	Present in Park	Abundant
Myrica pensylvanica	northern bayberry	Present in Park	Common
Myriophyllum pinnatum	cut-leaf water-milfoil, cutleaf watermilfoil, green parrotfeather	Present in Park	Rare
Mysidopsis almyra	No data	Present in Park	No data
Mytilus edulis	blue mussel, edible blue mussel	Present in Park	No data
Narcissus pseudonarcissus	common daffodil, daffodil	Present in Park	Rare
Nassariidae	No data	Present in Park	No data

Nassarius trivittatus	threeline mudsnail	Present in Park	No data
Nassarius vibex	bruised nassa	Present in Park	No data
Natrix sipedon	No data	Present in Park	Uncommon
Naucrates ductor	pilotfish	Present in Park	No data
Neopanope texana sayi	No data	Present in Park	No data
Nepeta cataria	catmint, catnip, catwort, field balm	Present in Park	Rare
Nerodia sipedon sipedon	Northern Water Snake	Present in Park	No data
Noetia ponderosa	ponderous ark	Present in Park	No data
Notemigonus crysoleucas	golden shiner	Present in Park	No data
Numenius phaeopus	Whimbrel	Present in Park	No data
Nyctea scandiaca	snowy owl	Present in Park	No data
Nyssa sylvatica	black gum, black tupelo, blackgum	Present in Park	Common
Oceanodroma leucorhoa	Leach's Storm-Petrel	No data	No data
Odocoileus virginianus	white-tailed deer	Present in Park	Uncommon
Odontaspis taurus	sand tiger	Present in Park	No data
Odontoschisma prostratum	No data	Present in Park	Common
Oecetis	No data	Present in Park	No data
Oenothera biennis	common evening primrose, common evening-primrose, common eveningprimrose, evening primrose (common), hoary eveningprimrose, king's-cureall	Present in Park	Common
Oenothera fruticosa	narrowleaf evening-primrose	Present in Park	Common
Oenothera fruticosa var. humifusa	No data	NA	NA
Oenothera fruticosa var. linearis	No data	NA	NA
Oenothera fruticosa var. unguiculata	No data	NA	NA
Oenothera humifusa	seabeach evening-primrose, seabeach eveningprimrose	Present in Park	Common
Oenothera laciniata	cut-leaf evening-primrose, cut-leaved evening primrose, cutleaf evening-primrose, cutleaf eveningprimrose	Present in Park	Uncommon
Oldenlandia uniflora	clustered mille graines, oneflower oldenlandia	Probably Present	NA
Olivella mutica	variable dwarf olive	Present in Park	No data
Ondatra zibethicus	muskbeaver, muskrat	Present in Park	Common
Onoclea sensibilis	sensitive fern	Present in Park	Uncommon
Opheodrys aestivus	Rough Green Snake, Rough Greensnake	Present in Park	No data
Ophidion marginatum	striped cusk-eel	Present in Park	No data
Ophioderma brevispina	No data	Present in Park	No data
Ophiogomphus mainensis	No data	Present in Park	No data
Opisthonema oglinum	Atlantic thread herring	Present in Park	No data
Opsanus tau	oyster toadfish	Present in Park	No data
Opuntia humifusa	devil's-tongue, pricklypear	Present in Park	Uncommon
Oquilla empusa	No data	Present in Park	No data
Orobanche minor	hellroot, small broomrape	False Report	NA
Orthopristis chrysoptera	pigfish	Present in Park	No data
Oryzomys palustris	marsh rice rat	Present in Park	Common
Oryzomys palustris natator	rice rat, silver rice rat	Present in Park	No data
Oryzomys palustris palustris	marsh rice rat	No data	No data
Osmunda cinnamomea	cinnamon fern	Present in Park	Uncommon
Osmunda regalis	royal fern	Present in Park	Uncommon
Osmunda regalis var. spectabilis	royal fern	Present in Park	Uncommon
Ovalipes ocellatus	lady crab, ocellate lady crab	Present in Park	No data
Oxalis dillenii	Dillen's oxalis	Present in Park	Common
Oxalis europaea bushii subglabrata	No data	NA	NA
Oxalis europaea villicaulis	No data	NA	NA
Oxalis stricta	common yellow oxalis, erect woodsorrel, sheep sorrel, sourgrass, toad sorrel, upright yellow wood-sorrel, upright yellow woodsorrel, yellow woodsorrel	Present in Park	Rare
Oxyura jamaicensis	Ruddy Duck	Present in Park	No data
Pagurus longicarpus	long-armed hermit crab, longwrist hermit	Present in Park	No data

Pagurus pollicaris	flatclaw hermit, gray hermit crab	Present in Park	No data
Palaemonetes	No data	Present in Park	No data
Palaemonetes pugio	daggerblade grass shrimp	Present in Park	No data
Pallavicinia lyellii	No data	Present in Park	Common
Pandion haliaetus	Osprey	Present in Park	No data
Panicum	low panicum sp, panicgrass, panicum	NA	NA
Panicum agrostoides	No data	NA	NA
Panicum agrostoides var. condensum	No data	Present in Park	Common
Panicum amarulum	No data	Present in Park	Abundant
Panicum amarum	bitter panicgrass, bitter panicum	Present in Park	Uncommon
Panicum anceps	beaked panicgrass, beaked panicum	Present in Park	Rare
Panicum capillare	annual witchgrass, common panic grass, common witchgrass, panicgrass, ticklegrass, tumble panic, tumbleweed grass, witches hair, witchgrass	Present in Park	Common
Panicum columbianum var. oricola	No data	NA	NA
Panicum commonsianum	No data	Present in Park	Unknown
Panicum commutatum	No data	Present in Park	Unknown
Panicum dichotomiflorum	fall panic, fall panicgrass, fall panicum, western witchgrass	Present in Park	Unknown
Panicum dichotomiflorum var. dichotomiflorum	fall panicgrass, fall panicum, western witchgrass	Present in Park	Uncommon
Panicum dichotomiflorum var. geniculatum	No data	Present in Park	Uncommon
Panicum dichotomum	No data	Present in Park	Rare
Panicum lanuginosum lanuginosum	No data	NA	NA
Panicum lanuginosum var. fasciculatum	No data	NA	NA
Panicum lanuginosum var. implicatum	No data	Present in Park	Unknown
Panicum lanuginosum var. lindheimeri	No data	NA	NA
Panicum leucothrix	No data	Present in Park	Unknown
Panicum longifolium	No data	Present in Park	Rare
Panicum malacophyllum	No data	Present in Park	Unknown
Panicum meridionale var. albemarlense	No data	NA	NA
Panicum scoparium	No data	NA	NA
Panicum sphaerocarpon	No data	NA	NA
Panicum verrucosum	warty panicgrass	Present in Park	Uncommon
Panicum villosissimum	No data	Present in Park	Unknown
Panicum virgatum	old switch panic grass, switchgrass	Present in Park	Abundant
Panopeus	No data	Present in Park	No data
Paralichthys dentatus	fluke, summer flounder	Present in Park	No data
Paralichthys oblongus	fourspot flounder	Present in Park	No data
Parathemisto compressa	No data	Present in Park	No data
Parietaria floridana	Florida pellitory, pellitory	NA	NA
Parietaria pensylvanica	Pennsylvania pellitory	Present in Park	Rare
Parmotrema crinita	No data	Present in Park	Common
Parmotrema hypoleucinum	No data	Present in Park	Common
Parmotrema hypotropum	No data	Present in Park	Abundant
Parmotrema perforatum	No data	Present in Park	Abundant
Parmotrema rampoddense	No data	Present in Park	Common
Parthenocissus quinquefolia	American ivy, Virginia creeper, fiveleaved ivy, woodbine	Present in Park	Common
Paspalum ciliatifolium	No data	Present in Park	Unknown
Paspalum dilatatum	dallas grass, dallis grass, dallisgrass, herbe de miel, herbe sirop, hiku nua, palpalum dilate, water grass	Present in Park	Uncommon
Paspalum floridanum	Florida paspalum	Present in Park	Uncommon
Paspalum laeve	field paspalum	Present in Park	Common
Paspalum setaceum	fringeleaf paspalum, sand paspalum, slender crown grass, thin paspalum	Present in Park	Uncommon
Passer domesticus	House Sparrow	Present in Park	No data

Passiflora lutea	passionflower, yellow passionflower	Present in Park	Unknown
Pelecanus occidentalis	Brown Pelican	Present in Park	No data
Peltandra virginica	Virginia peltandra, green arrow arum	Present in Park	Rare
Penaeus aztecus	brown shrimp, northern brown shrimp	Present in Park	No data
Pentapodus vitta	butterfish, striped whiptail	Present in Park	No data
Peponocephala electra	melon-headed whale	Present in Park	Rare
Peprilus alepidotus	harvestfish	Present in Park	No data
Peprilus triacanthus	butterfish	Present in Park	No data
Peromyscus leucopus	white-footed mouse	Present in Park	Common
Peromyscus leucopus noveboracensis	northern white-footed mouse	No data	No data
Persea borbonia	redbay	Present in Park	Uncommon
Persea palustris	swamp bay	Present in Park	Rare
Pertusaria	No data	NA	NA
Pertusaria valliculata	No data	Present in Park	Common
Petricola pholadiformis	false angelwing	Present in Park	No data
Phaeographis sericea	No data	Present in Park	Abundant
Phalacrocorax auritus	Double-crested Cormorant	Present in Park	No data
Phalaropus lobatus	Red-necked Phalarope	No data	No data
Phalaropus tricolor	Wilson's Phalarope	No data	No data
Phleum pratense	common timothy, timothy	Present in Park	Rare
Phlox drummondii	annual phlox, drummond phlox	Present in Park	Rare
Phoca groenlandica	harp seal	Present in Park	No data
Phoca vitulina	harbor seal	Present in Park	Rare
Phocoena	common porpoises, harbor porpoises	Present in Park	Rare
Phocoena phocoena	common porpoise, harbor porpoise	Present in Park	No data
Phragmites australis	common reed	Present in Park	Abundant
Phragmites communis	common reed	NA	NA
Phyla lanceolata	frog fruit, lanceleaf fogfruit, lanceleaf frog fruit, northern fogfruit	Present in Park	Uncommon
Physalia physalis	portuguese man-of-war	Present in Park	No data
Physalis heterophylla	clammy ground-cherry, clammy groundcherry	Present in Park	Unknown
Physcia millegrana	No data	Present in Park	Abundant
Physeter catodon	sperm whale	Present in Park	Rare
Physeter macrocephalus	sperm whale	Present in Park	No data
Phytolacca americana	American pokeweed, common pokeweed, inkberry, pigeonberry, poke, pokeberry, pokeweed	Present in Park	Uncommon
Picea pungens	blue spruce, colorado blue spruce, silver spruce	Present in Park	Rare
Pinus echinata	arkansas pine, shortleaf pine, shortleaf yellow pine, shortstraw pine, southern yellow pine, yellow pine	Present in Park	Rare
Pinus nigra	Austrian pine, australian pine, european black pine	Present in Park	Uncommon
Pinus rigida	pitch pine	Present in Park	Rare
Pinus taeda	loblolly pine	Present in Park	Abundant
Pinus virginiana	Virginia pine, jersey pine, scrub pine	Present in Park	Uncommon
Pituophis melanoleucus	Pine Snake, Pinesnake	Unconfirmed	No data
Placopecten magellanicus	sea scallop	Present in Park	No data
Placynthiella uliginosa	No data	Present in Park	Common
Plantago aristata	bottlebrush Indianwheat, largebracted plantain	Present in Park	Uncommon
Plantago lanceolata	English plantain, buckhorn plantain, lanceleaf Indianwheat, lanceleaf plantain, narrowleaf plantain, ribgrass, ribwort	Present in Park	Uncommon
Plantago major	broadleaf plantain, buckhorn plantain, common plantain, great plantain, ripplseed plantain	Present in Park	Uncommon
Plantago maritima	goose tongue	Present in Park	Rare
Plantago rugelii	Rugels plantain, black-seed plantain, blackseed plantain	Present in Park	Uncommon
Plantago virginica	Virginia plantain, paleseed Indianwheat	Present in Park	Uncommon
Platanthera cristata	crested yellow orchid	NA	NA
Platanus occidentalis	American sycamore, sycamore	Present in Park	Rare

Plectrophenax nivalis	Snow Bunting	Present in Park	No data
Plethodon cinereus	Eastern Red-backed Salamander, Red-backed Salamander, Redback Salamander	Present in Park	No data
Pleuronectes americanus	winter flounder	Present in Park	No data
Pluchea foetida	stinking camphorweed	Present in Park	Uncommon
Pluchea odorata	marsh fleabane, sweetscent	Present in Park	Common
Pluchea purpurascens	No data	NA	NA
Pluvialis dominica	American Golden Plover, American Golden-Plover, Lesser Golden-Plover	Present in Park	No data
Pluvialis squatarola	Black-bellied Plover	Present in Park	No data
Poa annua	annual blue grass, annual bluegrass, walkgrass	Present in Park	Uncommon
Poa compressa	Canada bluegrass, flat-stem blue grass	Present in Park	Common
Poa pratensis	Kentucky bluegrass	Present in Park	Common
Podiceps auritus	Horned Grebe	Present in Park	No data
Podiceps grisegena	Red-necked Grebe	Present in Park	No data
Podilymbus podiceps	Pied-billed Grebe	Present in Park	No data
Podophyllum peltatum	may apple, mayapple	Present in Park	Unknown
Pogonia ophioglossoides	snake-mouth orchid, snakemouth orchid	Present in Park	Rare
Pogonias cromis	black drum	Present in Park	No data
Pohlia	pohlia moss	NA	NA
Polinices duplicatus	No data	Present in Park	No data
Pollachius virens	coalfish, pollock, saithe	Present in Park	No data
Polygala curtissii	Curtiss' milkwort	Present in Park	Unknown
Polygala verticillata var. isocycla	whorled milkwort	Present in Park	Rare
Polygonella articulata	coastal jointweed	Present in Park	Common
Polygonum amphibium var. stipulaceum	water smartweed	Historic	NA
Polygonum aviculare	prostrate knotweed, yard knotweed	Present in Park	Uncommon
Polygonum cespitosum var. longisetum	oriental ladysthumb	Present in Park	Unknown
Polygonum densiflorum	denseflower knotweed	Unconfirmed	NA
Polygonum glaucum	seaside knotweed	Present in Park	Uncommon
Polygonum hydropiperoides	swamp smartweed	Present in Park	Unknown
Polygonum pensylvanicum	Pennsylvania knotweed, Pennsylvania smartweed, pinkweed, pinweed	Present in Park	Common
Polygonum persicaria	lady's-thumb, ladysthumb, ladysthumb smartweed, smartweed, spotted knotweed, spotted ladysthumb, spotted smartweed	Present in Park	Uncommon
Polygonum punctatum	dotted smartweed	Present in Park	Common
Polypogon monspeliensis	annual rabbit's-foot grass, annual rabbitsfoot grass, rabbit'sfootgrass, rabbitfoot beardgrass, rabbitfoot grass, rabbitfoot polypogon, rabbitfootgrass	Present in Park	Common
Polypremum procumbens	juniper leaf	Present in Park	Rare
Polysporina simplex	No data	Present in Park	Common
Polytrichum ohioense	Ohio polytrichum moss	Present in Park	Common
Pomatomus saltatrix	bluefish	Present in Park	No data
Pomolobus aestivalis	No data	Present in Park	No data
Pomoxis nigromaculatus	black crappie	Present in Park	No data
Populus alba	white poplar	Present in Park	Common
Populus canescens	No data	NA	NA
Populus deltoides	common cottonwood, cottonwood, eastern cottonwood, plains cottonwood	Present in Park	Rare
Populus X canescens	gray poplar	Present in Park	Uncommon
Poronotus triacanthus	No data	Present in Park	No data
Poronotus triacanthus	No data	Present in Park	No data
Portulaca grandiflora	mossrose, rose moss	Present in Park	Rare
Portulaca oleracea	akulikuli-kula, common purslane, duckweed, garden purslane, little hogweed, little-hogweed, purslane, pursley, pusley, wild portulaca	Present in Park	Rare
Portunidae	swimming crabs	Present in Park	No data
Potamogeton pectinatus	sago pondweed	Present in Park	Rare
Potamogeton pusillus	baby pondweed, small pondweed	Present in Park	Rare
Potentilla canadensis	dwarf cinquefoil	Present in Park	Uncommon

Potentilla norvegica	Norwegian cinquefoil	Historic	NA
Potentilla recta	roughfruit cinquefoil, sulfur (or erect) cinquefoil, sulfur cinquefoil, sulphur cinquefoil	Present in Park	Rare
Prionotus carolinus	common searobin, northern searobin	Present in Park	No data
Prionotus evolans	striped searobin	Present in Park	No data
Procyon lotor	common raccoon, northern raccoon, raccoon	Present in Park	Common
Proserpinaca palustris	marsh mermaid-weed, marsh mermaidweed	Present in Park	Rare
Prunella vulgaris	common selfheal, heal all, healall, selfheal	Present in Park	Rare
Prunus maritima	beach plum	Present in Park	Rare
Prunus persica	peach	Present in Park	Rare
Prunus serotina	black cherry, black chokecherry	Present in Park	Abundant
Pseudacris triseriata kalmi	No data	Present in Park	No data
Pseudemys rubriventris	American red-bellied turtle, Northern Red-bellied Cooter, red-bellied turtle	Present in Park	No data
Pseudemys rubriventris rubriventris	Red-bellied Turtle	Present in Park	No data
Pseudopleuronectes americanus	Georges Bank flounder, blackback, lemon sole, rough flounder, winter flounder	Present in Park	No data
Pseudorhombus dupliciocellatus	fourspot flounder	Present in Park	No data
Pseudotolithes typus	weakfish	Present in Park	No data
Pteridium aquilinum	bracken, bracken fern, brackenfern, northern bracken fern, western brackenfern	Present in Park	Unknown
Pteridium aquilinum var. pseudocaudatum	bracken, bracken fern, western brackenfern	Present in Park	Rare
Ptilanthura tricarina	No data	Present in Park	No data
Ptilimnium capillaceum	herbwilliam, threadleaf mockbishopweed	Present in Park	Uncommon
Puccinellia distans	European alkaligrass, spreading alkali grass, weeping alkaligrass	Present in Park	Rare
Puccinellia fasciculata	Torrey alkaligrass, saltmarsh alkaligrass	Present in Park	Rare
Puccinellia pallida	No data	Historic	NA
Puffinus gravis	Greater Shearwater	No data	No data
Punctelia rudecta	No data	Present in Park	Abundant
Pylaisiella polyantha	pylaisiella moss	Present in Park	Common
Pyrrhopappus carolinianus	Carolina desert chicory, Carolina desert-chicory, Carolina false dandelion, Carolina false-dandelion	Present in Park	Uncommon
Pyrrhospora varians	No data	Present in Park	Abundant
Pyrus angustifolia	No data	NA	NA
Pyrus angustifolia var. spinosa	No data	Present in Park	Unknown
Pyrus arbutifolia	No data	NA	NA
Pyrus malus	No data	Present in Park	Unknown
Quamoclit coccinea	No data	Present in Park	Unknown
Quercus acutissima	sawtooth oak	Present in Park	Unknown
Quercus falcata	southern red oak	Present in Park	Common
Quercus nigra	water oak	Present in Park	Uncommon
Quercus palustris	pin oak	Present in Park	Rare
Quercus phellos	willow oak	Present in Park	Common
Quercus stellata	post oak	Present in Park	Uncommon
Quiscalus quiscula	Common Grackle	Present in Park	No data
Rachycentron canadum	cobia	Present in Park	No data
Raja eglanteria	clearnose skate	Present in Park	No data
Raja erinacea	little skate	Present in Park	No data
Ramalina americana	No data	Unconfirmed	NA
Rana catesbeiana	American Bullfrog, Bullfrog	Present in Park	No data
Rana clamitans melanota	Green Frog, Northern Green Frog	Present in Park	No data
Rana palustris	Pickerel Frog	Present in Park	No data
Rana pipiens	Northern Leopard Frog	Present in Park	No data
Rana sphenocephala	Southern Leopard Frog	Present in Park	No data
Rana utricularia	Southern Leopard Frog	Present in Park	No data
Ranunculus bulbosus	St. Anthony's turnip, blister flower, bulbous buttercup, bulbous crowfoot, gowan, yellow weed	Present in Park	Uncommon

Ranunculus parviflorus	smallflower buttercup, sticktight buttercup	Present in Park	Uncommon
Ranunculus sardous	hairy buttercup	Unconfirmed	NA
Ranunculus sceleratus	celeryleaf buttercup, cursed buttercup	Present in Park	Rare
Raphanus raphanistrum	wild radish	Present in Park	Rare
Rattus norvegicus	Norway rat	Present in Park	Uncommon
Rhamnus frangula	European alder, columnar buckthorn, fen buckthorn, glossy buckthorn, tall hedge buckthorn	Probably Present	NA
Rhexia aristosa	awnpetal meadowbeauty	Present in Park	Unknown
Rhexia mariana	Maryland meadowbeauty	Present in Park	Uncommon
Rhexia mariana var. mariana	Maryland meadowbeauty	NA	NA
Rhexia virginica	common meadowbeauty, handsome Harry	NA	NA
Rhinoptera bonasus	cownose ray	Present in Park	No data
Rhithropanopeus harrisii	Harris mud crab, estuarine mud crab	No data	No data
Rhus copallina	dwarf sumac, shining sumac	Present in Park	Common
Rhus radicans	poison ivy	NA	NA
Rhus trilobata	Skunkbush, skunkbush sumac	Historic	NA
Rhynchospora capitellata	brownish beakrush, brownish beaksedge	Present in Park	Uncommon
Rhynchospora glomerata	clustered beaksedge	Probably Present	NA
Rhynchospora gracilenta	slender beaksedge	Present in Park	Uncommon
Rhynchospora inundata	narrowfruit horned beaksedge	Present in Park	Unknown
Rimelia reticulata	No data	Present in Park	Abundant
Rimelia subisidiosa	No data	Present in Park	Common
Rissola marginata	striped cusk-eel	Present in Park	No data
Robinia pseudoacacia	black locust, false acacia, yellow locust	Present in Park	Rare
Roccus americanus	No data	Present in Park	No data
Roccus saxatilis	No data	Present in Park	No data
Rosa multiflora	multiflora rose	Present in Park	Uncommon
Rosa palustris	swamp rose	Present in Park	Common
Rosa rugosa	rugosa rose	Present in Park	Uncommon
Rotala ramosior	lowland rotala, lowland toothcup, rotala	Present in Park	Rare
Rubus allegheniensis	Allegheny blackberry	Present in Park	Unknown
Rubus argutus	prickly Florida blackberry, sawtooth blackberry	Present in Park	Common
Rubus cuneifolius	sand blackberry	Present in Park	Common
Rubus flagellaris	northern dewberry, whiplash dewberry	Present in Park	Common
Rubus pensilvanicus	Pennsylvania blackberry	Present in Park	Common
Rudbeckia hirta var. pulcherrima	blackeyed Susan	Present in Park	Rare
Rumex acetosella	common sheep sorrel, field sorrel, red (or sheep) sorrel, red sorrel, sheep sorrel	Present in Park	Common
Rumex crispus	Curley dock, curly dock, narrowleaf dock, sour dock, yellow dock	Present in Park	Uncommon
Rumex obtusifolius	bitter dock, bluntleaf dock	Present in Park	Unknown
Rumex patientia	patience dock	NA	NA
Ruppia maritima	widgeongrass	Present in Park	Uncommon
Rynchops niger	Black Skimmer	No data	No data
Rynchops nigra	No data	Present in Park	No data
Sabatia angularis	rosepink, squarestem rosegentian	Present in Park	Unknown
Sabatia campanulata	slender rose gentian, slender rosegentian	NA	NA
Sabatia stellaris	rose of Plymouth	Present in Park	Common
Sabatia stellaris f. albiflora	No data	Present in Park	Uncommon
Saccharum giganteum	sugarcane plumegrass	Present in Park	Rare
Sacciolepis striata	American cupscale	Present in Park	Rare
Sagina decumbens	beach pearlwort, trailing pearlwort	Present in Park	Uncommon
Salicornia bigelovii	dwarf saltwort	Present in Park	Uncommon

Salicornia europaea	No data	Present in Park	Common
Salicornia virginica	Virginia glasswort	Present in Park	Uncommon
Salix babylonica	weeping willow	Present in Park	Common
Salix nigra	black willow	Present in Park	Common
Salsola kali	Russian thistle, prickly Russian thistle, tumbleweed	Present in Park	Unknown
Salsola kali ssp. kali	Russian thistle, tumbleweed	NA	NA
Salsola kali var. caroliniana	No data	NA	NA
Salsola kali var. kali	No data	Present in Park	Common
Salvia lyrata	lyreleaf sage	Present in Park	Rare
Sambucus canadensis	american elder	Present in Park	Common
Samolus parviflorus	water-pimpernel	NA	NA
Samolus valerandi ssp. parviflorus	seaside brookweed, smaliflower water pimpernel, water brookweed	Present in Park	Common
Sanicula canadensis	Canada sanicle, Canadian blacksnakeroot	Present in Park	Rare
Sassafras albidum	sassafras	Present in Park	Common
Sceloporus undulatus	Eastern Fence Lizard, Fence Lizard, Plateau Lizard, Prairie Lizard	Present in Park	No data
Sceloporus undulatus hyacinthinus	Northern Fence Lizard	Present in Park	No data
Schizachyrium scoparium ssp. littorale	little bluestem	NA	NA
Schizachyrium scoparium var. littorale	No data	Present in Park	Common
Sciaenops ocellatus	red drum	Present in Park	No data
Scincella lateralis	Ground Skink, Little Brown Skink	Present in Park	No data
Scirpus americanus	No data	Present in Park	Abundant
Scirpus cyperinus	bulrush, woolgrass	Present in Park	Uncommon
Scirpus robustus	No data	Present in Park	Rare
Sciurus carolinensis	eastern gray squirrel, gray squirrel	Present in Park	Rare
Sciurus niger cinereus	Delmarva Peninsula fox squirrel, eastern fox squirrel	Present in Park	Uncommon
Scleranthus annuus	German knotgrass, knawel	Present in Park	Uncommon
Scleria verticillata	low nutrush	Present in Park	Common
Scolopax minor	American Woodcock	Present in Park	Uncommon
Scomberesox saurus	Atlantic saury, skipper garfish	Present in Park	No data
Scomberomorus cavalla	king mackerel	Present in Park	No data
Scomberomorus maculatus	Atlantic Spanish mackerel, Spanish mackerel	Present in Park	No data
Scophthalmus aquosus	brill, sand dab, spotted flounder, windowpane	Present in Park	No data
Seila adamsi	No data	Present in Park	No data
Selene setapinnis	Atlantic moonfish	Present in Park	No data
Selene vomer	lookdown	Present in Park	No data
Senecio tomentosus	woolly ragwort	Present in Park	Uncommon
Senecio vulgaris	common groundsel, old-man-in-the-Spring	Present in Park	Uncommon
Sesuvium maritimum	slender seapurslane	Present in Park	Uncommon
Setaria faberi	Chinese foxtail, Chinese millet, Japanese bristlegrass, giant bristlegrass, giant foxtail, nodding foxtail, tall green bristlegrass	Present in Park	Common
Setaria geniculata	marsh bristlegrass	Present in Park	Common
Setaria glauca	pearl millet, pigeongrass, wild millet, yellow bristlegrass, yellow foxtail	Present in Park	Common
Setophaga ruticilla	American Redstart	No data	No data
Silene alba	bladder campion, white campion, white cockle	Present in Park	Unknown
Sinum perspectivum	white baby ear	Present in Park	No data
Sisyrinchium atlanticum	eastern blue-eyed grass, eastern blueeyed grass	Present in Park	Common
Sitta canadensis	Red-breasted Nuthatch	No data	No data
Smilacina racemosa	No data	Present in Park	Unknown
Smilax bona-nox	saw greenbrier	Present in Park	Rare
Smilax glauca	cat greenbrier	Present in Park	Common
Smilax rotundifolia	bullbriar, common catbriar, common greenbrier, greenbrier, horsebriar, roundleaf greenbriar, roundleaf greenbrier	Present in Park	Abundant
Smilax walteri	coral greenbrier	Present in Park	Rare

Solanum americanum	American black nightshade, purple nightshade (common), smallflower nightshade	Present in Park	Rare
Solanum carolinense	Carolina horsenettle, apple of Sodom, bull nettle, devil's tomato, horsenettle, sand briar	Present in Park	Uncommon
Solanum nigrum	black nightshade, deadly nightshade, garden nightshade	Present in Park	Common
Solanum nigrum vulgare	No data	NA	NA
Solen	No data	Present in Park	No data
Solen viridis	green jackknife, green jackknife clam	Present in Park	No data
Solidago canadensis var. scabra	Canada goldenrod, Canadian goldenrod	Present in Park	Rare
Solidago fistulosa	pinebarren goldenrod	Present in Park	Uncommon
Solidago graminifolia	No data	NA	NA
Solidago juncea	early goldenrod	Present in Park	Rare
Solidago rugosa ssp. aspera	wrinkled goldenrod, wrinkleleaf goldenrod	Present in Park	Uncommon
Solidago rugosa var. aspera	No data	NA	NA
Solidago sempervirens	seaside goldenrod	NA	NA
Solidago sempervirens var. mexicana	seaside goldenrod	Present in Park	Common
Solidago sempervirens var. sempervirens	seaside goldenrod	Present in Park	Common
Solidago tenuifolia	No data	Present in Park	Uncommon
Somateria mollissima	Common Eider	Present in Park	No data
Somateria spectabilis	King Eider	Present in Park	No data
Sonchus asper	perennial sowthistle, prickly sowthistle, spiny sowthistle, spiny-leaf sow-thistle	Present in Park	Common
Sonchus oleraceus	annual sowthistle, common sow-thistle, common sowthistle, pualele, sow thistle, sow-thistle	Present in Park	Rare
Spartina alterniflora	Atlantic cordgrass, saltmarsh cordgrass, smooth cordgrass	Present in Park	Abundant
Spartina cynosuroides	big cordgrass	Present in Park	Uncommon
Spartina patens	marshhay cordgrass, salt meadow cordgrass, saltmeadow cordgrass	Present in Park	Abundant
Specularia perfoliata	No data	NA	NA
Spergularia marina	No data	Present in Park	Uncommon
Spergularia rubra	purple sandspurry, red sandspurry	Present in Park	Rare
Sphacelaria	No data	NA	NA
Sphagnum capillifolium var. tenellum	No data	Present in Park	Uncommon
Sphagnum palustre	prairie sphagnum	Present in Park	Common
Sphagnum recurvum	recurved sphagnum	Present in Park	Uncommon
Sphenopholis obtusata	prairie wedgegrass, prairie wedgescale	Present in Park	Uncommon
Sphinctrina anglica	No data	Present in Park	Common
Sphoeroides maculatus	northern puffer	Present in Park	No data
Sphoeroides nephelus	southern puffer	Present in Park	No data
Sphyraena barracuda	great barracuda	Present in Park	No data
Sphyraena borealis	northern sennet	Present in Park	No data
Sphyrapicus varius	Yellow-bellied Sapsucker	No data	No data
Sphyrna zygaena	smooth hammerhead	No data	No data
Spiranthes cernua	nodding ladies'-tresses, nodding ladiestresses, white nodding ladies'-tresses	Present in Park	Rare
Spiranthes praecox	greenvein ladies'-tresses, greenvein ladiestresses	Probably Present	NA
Spiranthes vernalis	spring ladies'-tresses, upland ladiestresses	Present in Park	Uncommon
Spirodela polyrhiza	giant duckweed	Present in Park	Rare
Spisula solidissima	Atlantic surfclam	Present in Park	No data
Sporobolus indicus	Rattail smutgrass, smut grass, smutgrass	Present in Park	Uncommon
Sporobolus poiretii	No data	NA	NA
Sporobolus vaginiflorus	poverty dropseed, poverty grass	Present in Park	Rare
Squalus acanthias	dogfish, grayfish, piked dogfish, spiny dogfish, spurdog	Present in Park	No data
Squilla empusa	No data	Present in Park	No data
Stellaria media	chickweed, common chickweed, nodding chickweed	Present in Park	Uncommon
Stenella	spinner dolphins, spotted dolphins, striped dolphins	Present in Park	No data

Stenella coeruleoalba	striped dolphin	Present in Park	No data
Stenella frontalis	Atlantic spotted dolphin	No data	No data
Stenella plagiodon	No data	Present in Park	Rare
Steno bredanensis	rough-toothed dolphin	Present in Park	Rare
Stenotomus chrysops	porgy, scup	Present in Park	No data
Stercorarius parasiticus	Parasitic Jaeger	Present in Park	Unknown
Sterna antillarum	Least Tern	Present in Park	No data
Sterna caspia	Caspian Tern	Present in Park	No data
Sterna dougallii dougallii	No data	Present in Park	No data
Sterna forsteri	Forster's Tern	Present in Park	No data
Sterna hirundo	Common Tern	Present in Park	No data
Sterna maxima	Royal Tern	Present in Park	No data
Sterna nilotica	Gull-billed Tern	Present in Park	No data
Sterna sandvicensis	Sandwich Tern	Present in Park	No data
Storeria dekayi dekayi	Northern Brown Snake	Present in Park	No data
Stromateus fiatola	harvestfish	Present in Park	No data
Strongylura marina	Atlantic needlefish, silver gar	Present in Park	No data
Strophostyles helvola	No data	Present in Park	Common
Strophostyles umbellata	perennial wildbean, pink fuzzybean	Present in Park	Uncommon
Sturnella magna	Eastern Meadowlark	Present in Park	No data
Sturnus vulgaris	European Starling	Present in Park	No data
Suaeda linearis	annual seepweed	Present in Park	Rare
Suaeda maritima	herbaceous seepweed	Present in Park	Rare
Sula bassanus	Northern Gannet	Present in Park	No data
Sylvilagus floridanus	eastern cottontail	Present in Park	Common
Symphurus plagiusa	blackcheek tonguefish	Present in Park	No data
Syngnathus floridae	dusky pipefish	Present in Park	No data
Syngnathus fuscus	northern pipefish	Present in Park	No data
Synodus foetens	inshore lizardfish	Present in Park	No data
Tachybaptus dominicus bangsi	Least Grebe	Present in Park	No data
Tachycineta bicolor	Tree Swallow	Present in Park	No data
Tagelus plebeius	stout tagelus	Present in Park	No data
Tagetes erecta	Aztec marigold	Present in Park	Rare
Tamarix	tamarisk	NA	NA
Taraxacum officinale	blowball, common dandelion, dandelion, faceclock	Present in Park	Uncommon
Tautoga onitis	tautog	Present in Park	No data
Tautogolabrus adspersus	cunner	Present in Park	No data
Teesdalia nudicaulis	barestem teesdalia	Present in Park	Uncommon
Telaranea nematodes	No data	Present in Park	Uncommon
Tellina agilis	northern dwarf tellin, northern dwarf-tellin	Present in Park	No data
Terebra dislocata	eastern auger	Present in Park	No data
Terrapene carolina carolina	Eastern Box Turtle	Present in Park	No data
Teucrium canadense	American germander, Canada germander, Candad germander, germander, hairy germander, wood sage	NA	NA
Teucrium canadense var. canadense	American germander, Canada germander	Present in Park	Uncommon
Thais haemastoma floridana	Florida rocksnail	Present in Park	No data
Thamnophis sirtalis	Common Garter Snake	Present in Park	No data
Thelypteris palustris	eastern marsh fern, marsh fern, meadow fern	Present in Park	Common
Thyone briareus	No data	Present in Park	No data
Toxicodendron radicans	eastern poison ivy, poison ivy, poisonivy	Present in Park	Abundant
Toxicodendron vernix	poison sumac	Present in Park	Unknown
Trachinotus blochii	tropical pompano	Present in Park	No data

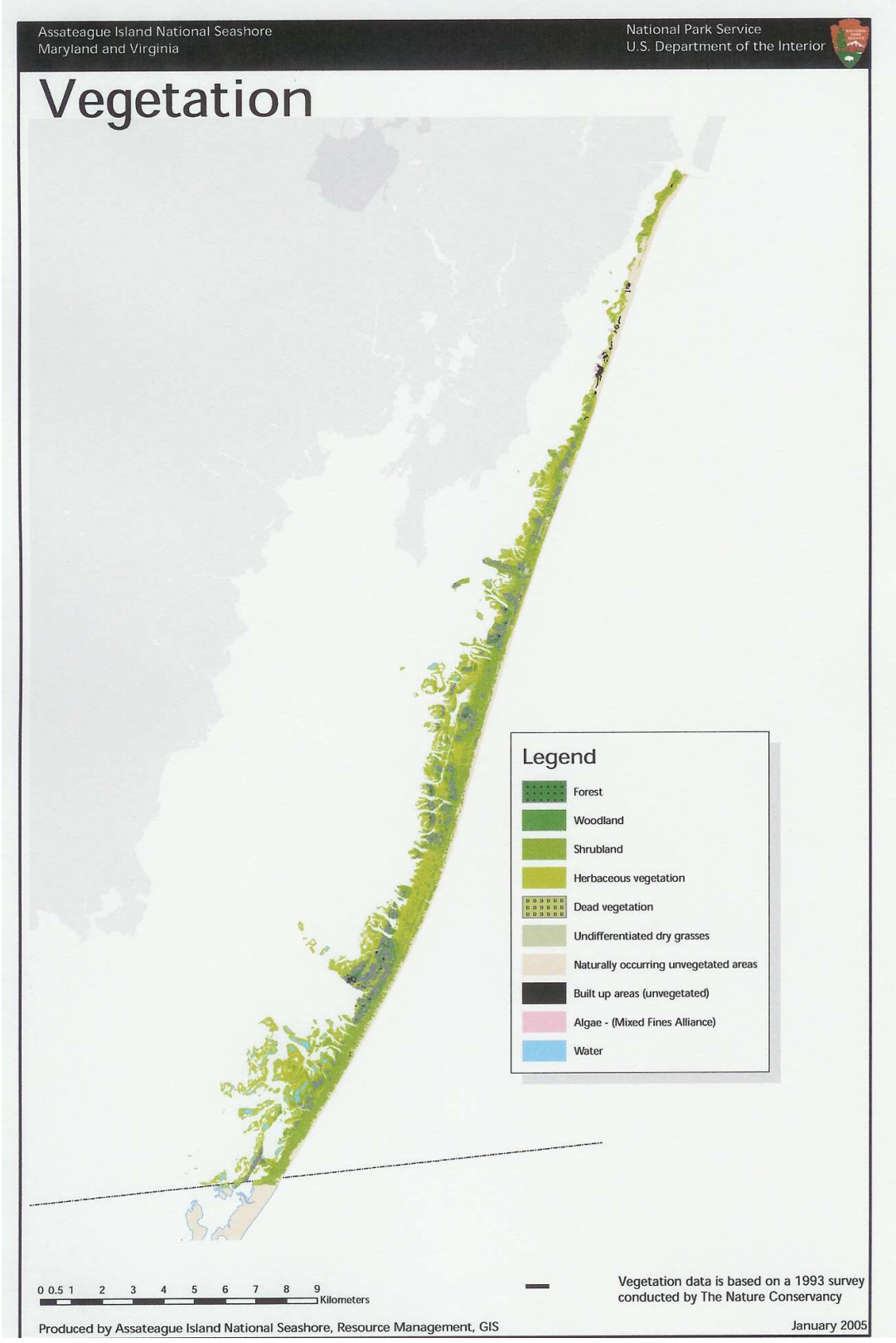
Trachinotus carolinus	Florida pompano	Present in Park	No data
Trachinotus falcatus	permit	Present in Park	No data
Trachurus trachurus	horse mackerel	Present in Park	No data
Tragopogon pratensis	Jack-go-to-bed-at-noon, meadow salsify	NA	NA
Triadenum virginicum	Virginia marsh St. Johnswort, marsh st. john's wort	Present in Park	Unknown
Trichiuridae	cutlassfishes, hairtails, ribbonfishes	Present in Park	No data
Trichiurus lepturus	Atlantic cutlassfish, Australian hairtail, largehead hairtail	No data	No data
Trichostema dichotomum	blue curls, forked bluecurls	NA	NA
Trichostema dichotomum dichotomum	No data	Present in Park	Common
Tridens flavus	Purpletop, purpletop tridens	Present in Park	Uncommon
Trifolium agrarium	No data	Present in Park	Unknown
Trifolium arvense	hairy clover, hare's foot clover, oldfield clover, rabbit-foot clover, rabbitfoot clover, stone clover	Present in Park	Uncommon
Trifolium dubium	hop clover, smallhop clover, suckling clover	Present in Park	Uncommon
Trifolium incarnatum	crimson clover	Present in Park	Rare
Trifolium pratense	red clover	Present in Park	Rare
Trifolium procumbens	No data	Present in Park	Uncommon
Trifolium repens	Dutch clover, ladino clover, white clover	Present in Park	Uncommon
Trinectes maculatus	hogchoker	Present in Park	No data
Tringa flavipes	Lesser Yellowlegs	No data	No data
Tringa melanoleuca	Greater Yellowlegs	Present in Park	No data
Tringa solitaria	Solitary Sandpiper	Present in Park	No data
Triodanis perfoliata	Venus lookingglass, clasping Venus' looking-glass, clasping Venus' lookingglass, clasping bellwort, clasping venuslookingglass, clasping-leaf venus'-looking-glass, common Venus' lookingglass, roundleaved triodanis	Present in Park	Uncommon
Triodia flava	No data	NA	NA
Triplasis purpurea	purple sand grass, purple sandgrass	Present in Park	Common
Tripsacum dactyloides	eastern gamagrass	Present in Park	Rare
Triticum aestivum	common wheat, wheat	Historic	NA
Trypethelium virens	No data	Present in Park	Common
Tubifex tubifex	No data	Present in Park	No data
Turbonilla interrupta	No data	Present in Park	No data
Turbonilla pocahontasae	No data	Present in Park	No data
Turbonilla virginica	No data	Present in Park	No data
Tursiops truncatus	bottlenose dolphin, bottlenosed dolphin	Present in Park	Common
Tylosurus marinus	No data	Present in Park	No data
Tylosurus marinus	No data	Present in Park	No data
Typha angustifolia	narrow-leaf cat-tail, narrowleaf cattail	Present in Park	Common
Typha latifolia	broadleaf cattail, cattail, cattail (common), common cattail	Present in Park	Uncommon
Tyrannus tyrannus	Eastern Kingbird	Present in Park	No data
Uca pugilator	Atlantic sand fiddler	Present in Park	No data
Uca pugnax	Atlantic marsh fiddler	Present in Park	No data
Ulmus rubra	slippery elm	Present in Park	Rare
Ulva lactuca	No data	Present in Park	Unknown
Uniola laxa	No data	NA	NA
Uniola paniculata	seaoats	Present in Park	Rare
Upeneus parvus	dwarf goatfish	Present in Park	No data
Urophycis chuss	red hake, squirrel hake	Present in Park	No data
Urophycis regia	spotted codling, spotted hake	Present in Park	No data
Urophycis regius	No data	Present in Park	No data
Urophycis regius	No data	Present in Park	No data
Urosalpinx cinerea	Atlantic oyster drill	Present in Park	No data
Usnea strigosa	No data	Present in Park	Abundant
Utricularia subulata	zigzag bladderwort	Present in Park	Rare

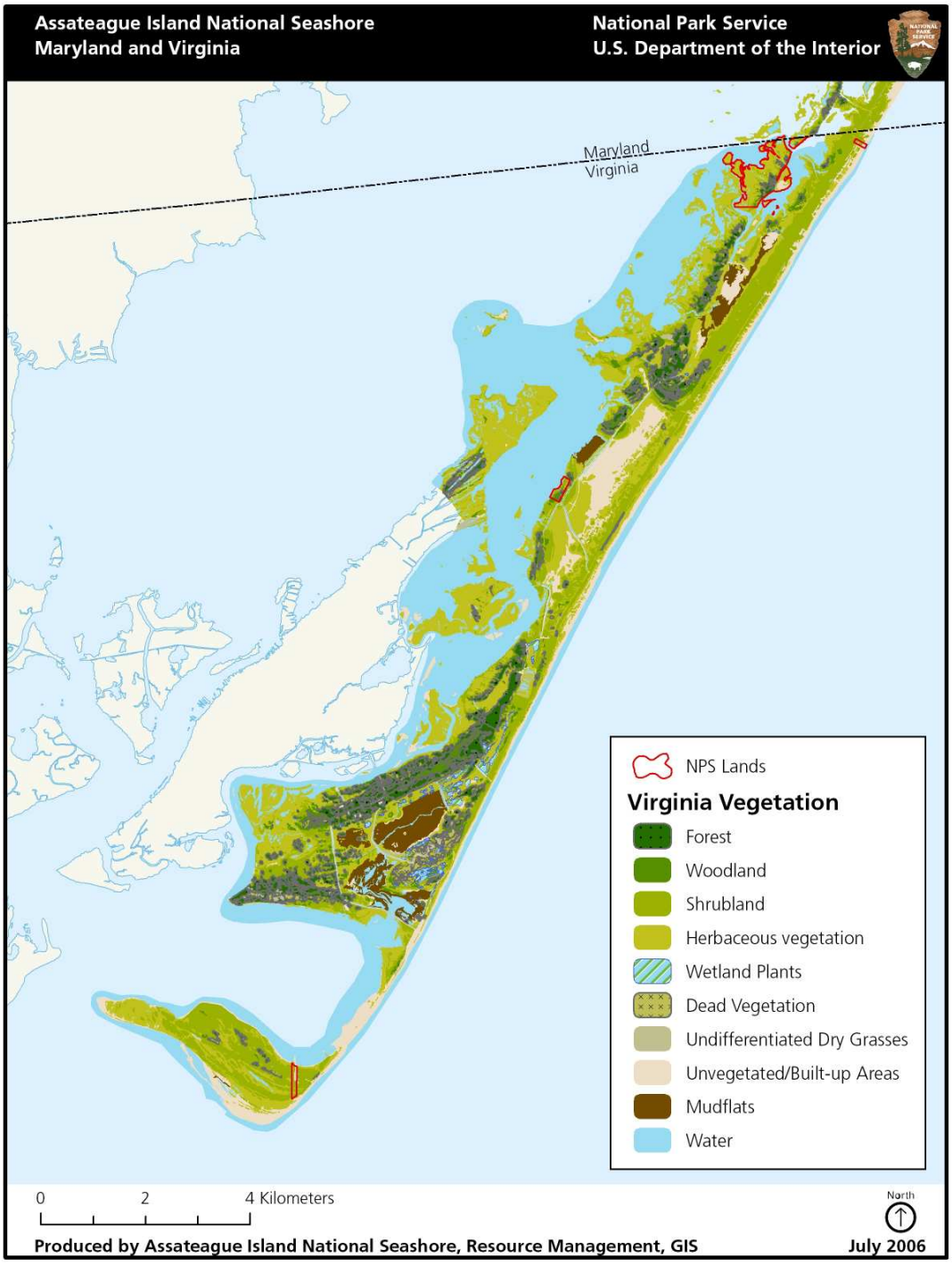
Vaccinium atrococcum	No data	NA	NA
Vaccinium caesariense	New Jersey blueberry	NA	NA
Vaccinium corymbosum	highbush blueberry	Present in Park	Common
Vaccinium macrocarpon	cranberry	Present in Park	Rare
Valerianella radiata	beaked cornsalad	Present in Park	Rare
Verbascum blattaria	moth mullein, white moth mullein	Present in Park	Uncommon
Verbascum thapsus	big taper, common mullein, flannel mullein, flannel plant, great mullein, mullein, velvet dock, velvet plant, woolly mullein	Present in Park	Rare
Verbena officinalis	herb of the cross	Present in Park	Rare
Verbena urticifolia	white verbena, white vervain	Present in Park	Unknown
Verbesina occidentalis	yellow crownbeard	Present in Park	Unknown
Vermicularia spirata	West Indian wormsnail	Present in Park	No data
Vernonia noveboracensis	New York ironweed	Present in Park	Unknown
Veronica arvensis	common speedwell, corn speedwell, rock speedwell, wall speedwell	Present in Park	Common
Veronica peregrina	neckweed, purslane speedwell	Present in Park	Uncommon
Viburnum dentatum var. lucidum	southern arrowwood	NA	NA
Viburnum recognitum	northern arrow-wood	Present in Park	Common
Vicia angustifolia	garden vetch	Present in Park	Uncommon
Vicia cracca	bird vetch, cow vetch	NA	NA
Vicia dasycarpa	No data	Present in Park	Rare
Vicia hirsuta	tiny vetch	Present in Park	Unknown
Vinca minor	common periwinkle, lesser periwinkle, myrtle	Present in Park	Rare
Viola cucullata	marsh blue violet	Present in Park	Rare
Viola lanceolata	bog white violet, lanceleaf violet	Present in Park	Common
Viola palmata	early blue violet, trilobed violet	Present in Park	Unknown
Viola primulifolia	No data	Present in Park	Rare
Viola sagittata	arrow-leaved violet, arrowleaf violet	Present in Park	Unknown
Virginia valeriae valeriae	Eastern Earth Snake	Present in Park	No data
Vitis aestivalis	summer grape	Present in Park	Common
Vitis rotundifolia	muscadine, muscadine grape	Present in Park	Abundant
Vomer setapinnis	No data	Present in Park	No data
Vulpes vulpes	red fox	Present in Park	Common
Vulpes vulpes fulva	black fox, cross fox, red fox, silver fox	No data	No data
Vulpia bromoides	brome fescue, brome six-weeks grass, desert fescue	Historic	NA
Vulpia elliotea	No data	NA	NA
Vulpia myuros	foxtail fescue, rat-tail fescue, rat-tailed fescue, rattail fescue	Present in Park	Common
Vulpia octoflora	eight-flower six-weeks grass, pullout grass, sixweeks fescue, sixweeks grass	Present in Park	Uncommon
Vulpia octoflora var. tenella	No data	Present in Park	Common
Weissia controversa	controverial weissia moss	Present in Park	Uncommon
Woodwardia areolata	chainfern, netted chainfern	Present in Park	Common
Woodwardia virginica	Virginia chainfern, virginia chainfern	Present in Park	Rare
Xanthium strumarium	cocklebur, cockleburr, common cocklebur, rough cocklebur, rough cockleburr	Present in Park	Common
Xanthoxylum clava-herculis	No data	Present in Park	Rare
Xyris caroliniana	Carolina yelloweyed grass	Present in Park	Uncommon
Xyris torta	common yelloweyed grass, slender yelloweyed grass	Present in Park	Uncommon
Yucca filamentosa	Adam's needle	Present in Park	Rare
Zapus hudsonius	meadow jumping mouse	Present in Park	Common
Zapus hudsonius americanus	meadow jumping mouse	No data	No data
Zenaida macroura	Mourning Dove	Present in Park	No data
Ziphius cavirostris	Cuvier's beaked whale, goose-beaked whale, goosebeak whale	Present in Park	Rare
Zostera marina	seawrack	Present in Park	Abundant

(Park = Assateague Island National Seashore) ORDER BY Standard Scientific Name
Report generated by the NPS Inventory and Monitoring Program on 07/10/2006

APPENDIX D

VEGETATION MAPS


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Vegetation
Legend
Forest
Woodland
Shrubland
Herbaceous vegetation
Dead vegetation
Undifferentiated dry grasses
Naturally occurring unvegetated areas
Built up areas (unvegetated)
Algae - (Mixed Fines Alliance)
Water
0 0.5 1 2 3 4 5 6 7 8 9
Kilometers
Vegetation data is based on a 1993 survey conducted by The Nature Conservancy
Produced by Assateague Island National Seashore, Resource Management, GIS
January 2005


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Maryland
Virginia
NPS Lands
Virginia Vegetation
Forest
Woodland
Shrubland
Herbaceous vegetation
Wetland Plants
Dead Vegetation
Undifferentiated Dry Grasses
Unvegetated/Built-up Areas
Mudflats
Water
0
2
4 Kilometers
North
Produced by Assateague Island National Seashore, Resource Management, GIS
July 2006

APPENDIX E

WILDLAND FIRE IMPLEMENTATION PLAN
STAGE I

APPENDIX E
WILDLAND FIRE IMPLEMENTATION PLAN STAGE 1

Fire Name					
Fire Number					
Jurisidiction(s)					
Administrative Unit(s)					
FMP Unit(s)					
Geographic Area					
Management Code					
Start Date/Time					
Discovery Date/Time					
Current Date/Time					
Current Size					
Location:	Legal Description(s)	T.	R.	Sec.	Sub.
	Latitude				
	Longitude				
	UTM:				
	County:				
	Local Description				
Cause					
Fuel Model/Conditions					
Current Weather					
Predicted Weather					

Availability of Resources	

DECISION CRITERIA CHECKLIST

Decision Element	Yes	No
Is there a threat to life, property, or resources that cannot be mitigated?		
Are potential effects on cultural and natural resources outside the range of acceptable effects?		
Are relative risk indicators and/or risk assessment results unacceptable to the appropriate Agency Administrator?		
Is there other proximate fire activity that limits or precludes successful management of this fire?		
Are there other Agency Administrator issues that preclude wildland fire use?		

The Decision Criteria Checklist is a process to assess whether or not the situation warrants continued wildland fire use implementation. A “Yes” response to any element on the checklist indicates that the appropriate management response should be suppression-oriented.

Recommended Response Action (check appropriate box)	NO-GO (Initial attack/suppression action)	
	GO (Other appropriate management response)	

Signature	Date

APPENDIX F

ADJECTIVE CLASS DESIGNATION
STAFFING CLASS DUTIES

Staffing Activity Class

I (LOW) No additional activity necessary. Normal eight (8) hour tours of duty. If the seashore has any red-carded employees on staff, they will be prepared to respond to any reported fires.

Fire Conditions: Fires do not readily start. If an ignition occurs, fires will present a low level of control difficulty. Fires occurring at this level can generally be controlled with existing local resources.

II (MODERATE)

Normal eight (8) hour tours of duty. If the seashore has any red-carded employees on staff, they will be prepared to respond to reported fires.

Fire Conditions: Fires will present a moderate level of control activity. Multiple fires in the same burning period will begin to affect other services. Wind speed and/ or the presence of drought will determine severity of fire spread. Fire fuels will be dry. Effectiveness of initial attack forces will be critical. Rapid response time will be important to the potential success of suppression operations.

III (HIGH) Normal eight (8) hour tours of duty. ***All*** Seashore personnel are prepared to respond to a report of a fire (within the limits of their training and certification). All relevant personnel know location of red-carded personnel. Red-carded personnel have personal protective equipment immediately available at their work site.

A Step-up to Staffing Class IV should be considered if one or more of the following conditions exist:

- A high visitation period is determined to pose an exceptional human-caused risk of wildland fire.
- Hunting season opens or is in progress outside the seashore (contingent upon local conditions).
- Red Flag Warning is posted by the National Weather Service.
- Eastern Interagency Regional Coordination Center (GACC) or Southern Interagency Regional Coordination Center (SACC) are at Staffing Class IV or V.

Fire Conditions: Fires will present a high level of control difficulty. All of the seashore's red-carded personnel may be involved in control efforts, especially if there is a large fire. Light fuels are very dry. Heavy fuels are nearly dry. Fires will spread rapidly. Multiple fire situations are very possible. Quick response and short control time are critical. Spotting may occur. Mop-up will be more difficult and time-consuming and require considerable personnel to accomplish.

IV (VERY HIGH)

All activities in Staffing Class III are continued. All red-carded firefighters are on duty during the peak burning period (1000-1800). Lieu days and leave may be cancelled for red-carded firefighters. High Fire Danger notices will be posted at the Seashore's Visitor Centers and at site bulletin boards.

If the seashore desires to utilize preparedness activities for wildland fire during the period of very high fire danger, the approval for expenditure of emergency preparedness funds should be first obtained from the area FMO (SHEN).

Fire Conditions: Fires will be extremely difficult to control. Initial attack and reinforcing crews will have difficulty controlling a fire at this level. Only effective initial attack with the proper resources will allow effective control. Light fuels are extremely dry, and heavy fuels are dry as well.

V (EXTREME)

All activities in Staffing Class IV are continued. All fires may be prohibited including the use of fire grates, grills, and stoves. Restrictions and closures at the seashore may be deemed necessary (i.e.; smoking may be limited to paved parking areas only, no open fires, etc). All interpretive activities should include a fire safety message.

Fire Conditions: Temperatures are high and relative humidity is low. *All* fire fuels are very dry. Fires ignite easily and spread rapidly. Use of aircraft and/ or mechanized equipment may be indicated.

APPENDIX G

CHARTS FOR THE DETERMINATION

OF

APPROPRIATE MANAGEMENT RESPONSE

APPENDIX G
Charts Utilized for Determining Appropriate Management Response

Wildland and Prescribed Fire Management Policy, Implementation Procedures Reference Guide, April 1998

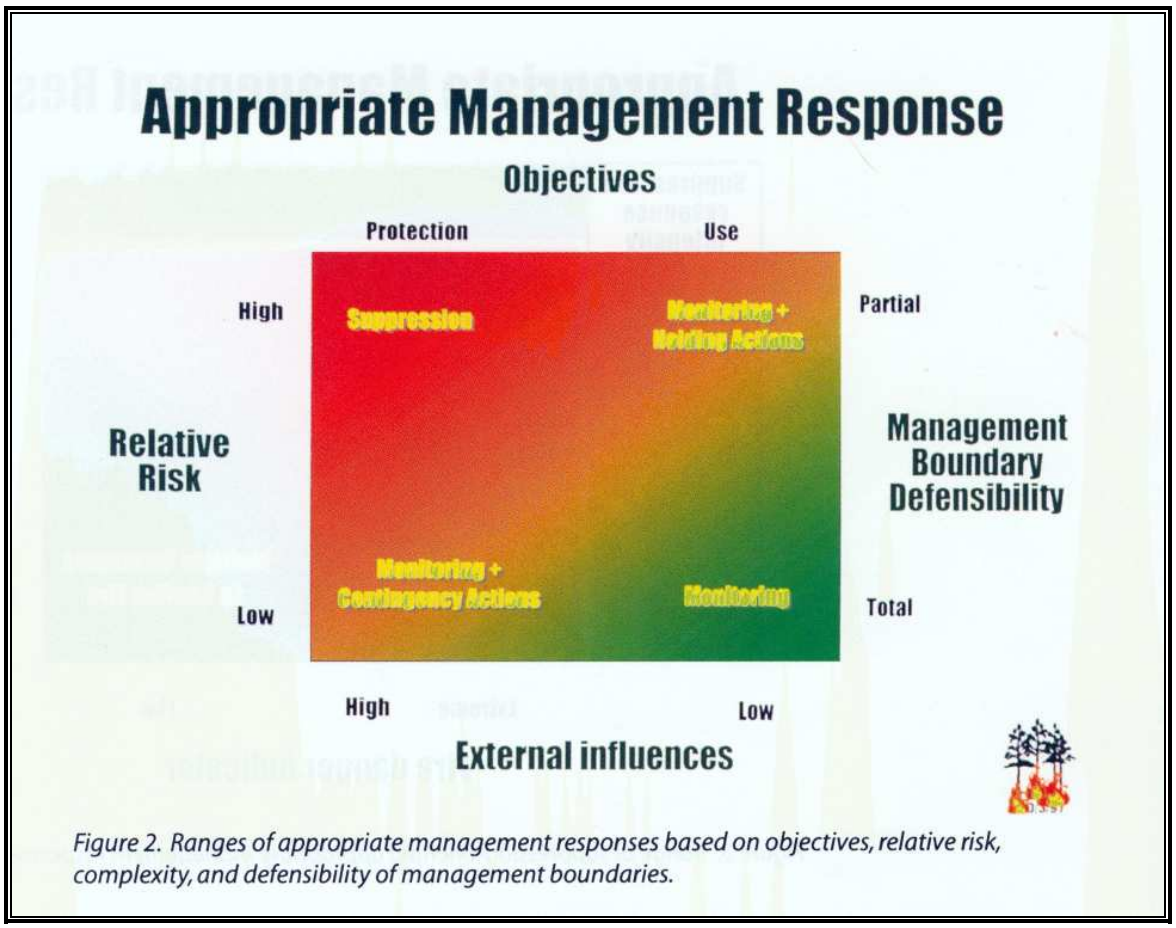


Figure 2. Ranges of appropriate management responses based on objectives, relative risk, complexity, and defensibility of management boundaries.

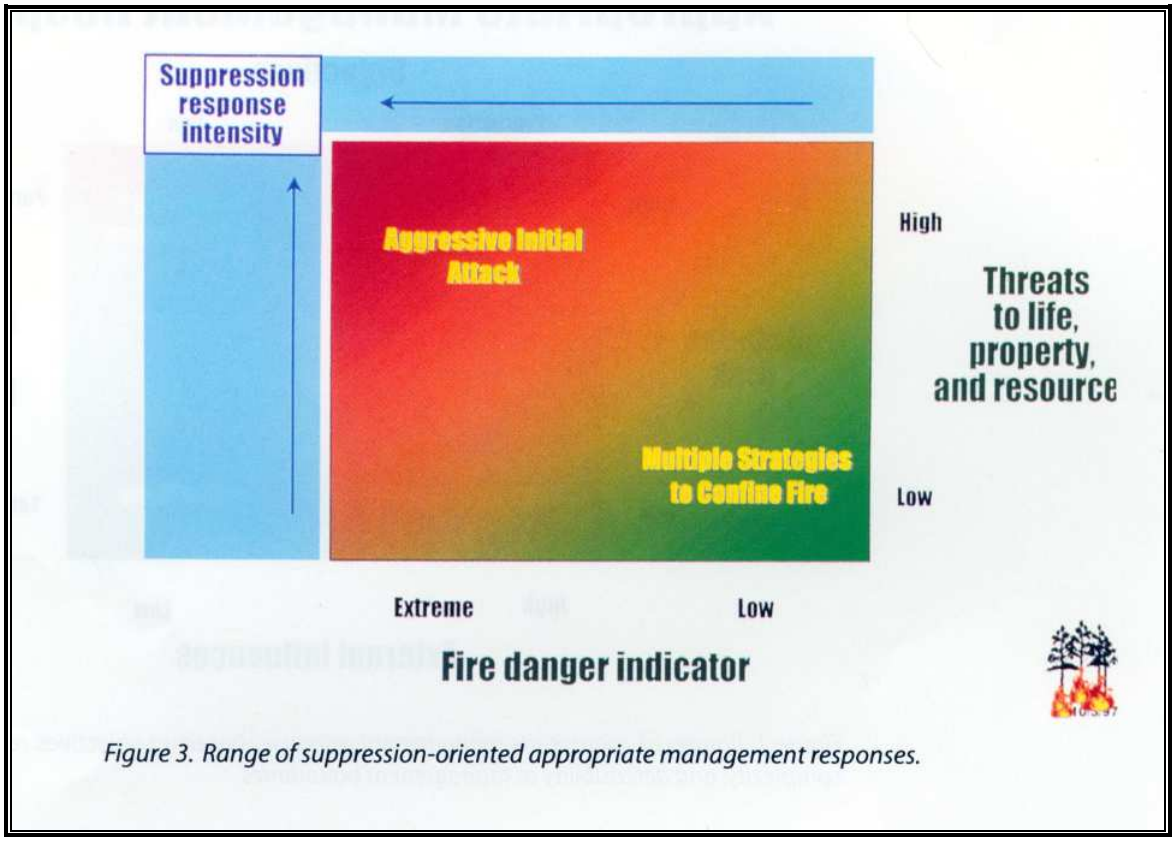


Figure 3. Range of suppression-oriented appropriate management responses.

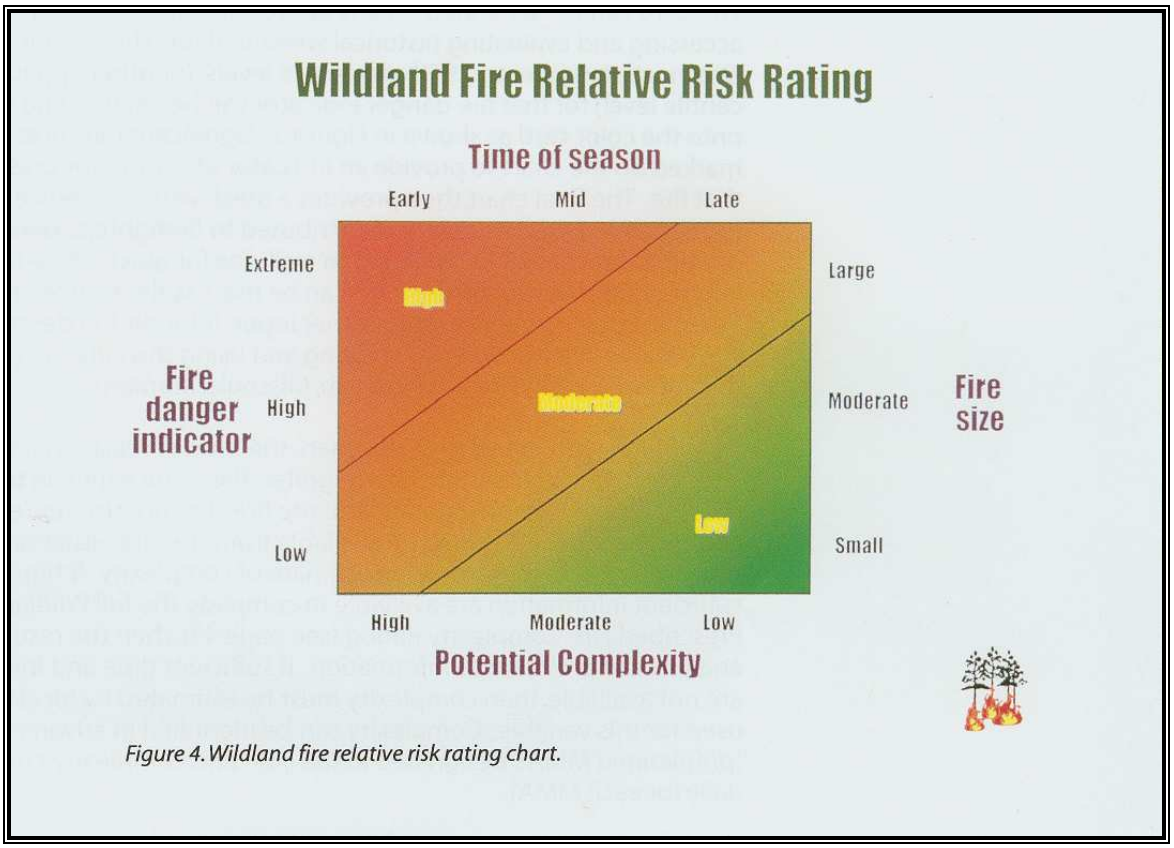


Figure 4. Wildland fire relative risk rating chart.

APPENDIX H

WILDLAND FIRE SITUATION ANALYSIS

(WFSA)

A GUIDE FOR ASSESSING FIRE COMPLEXITY

The following questions are presented as a guide to assist the Agency Administrator(s) and staff in analyzing the complexity or predicted complexity of a wildland fire situation. Because of the time required to assemble or move an Incident Management Team to a wildland fire, this checklist should be completed when a wildland fire escapes initial attack and be kept as a part of the fire records. This document is prepared concurrently with the preparation of (and attached to) a new or revised Wildland Fire Situation Analysis***. It must be emphasized this analysis should, where possible, be based on predictions to allow adequate time for assembling and transporting the ordered resources.***

Use of the Guide:

1. Analyze each element and check the response "yes" or "no."

2. If positive responses exceed, or are equal to, negative responses within any primary factor (A through G), the primary factor should be considered as a positive response.

3. If any three of the primary factors (A through G) are positive responses, this indicates the fire situation is, or is predicted to be, Type I.

4. Factor H should be considered after all the above steps. If more than two of these items are answered "yes," and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF WFSA TERMS

Potential for blow-up conditions - Any combination of fuels, weather, and topography excessively endangering personnel.

Rate or endangered species - Threat to habitat of such species or, in the case of flora, threat to the species itself.

Smoke management - Any situation which creates a significant public response, such as smoke in a metropolitan area or visual pollution in high-use scenic areas.

Extended exposure to unusually hazardous line conditions - Extended burnout or backfire situations, rockslide, cliffs, extremely steep terrain, abnormal fuel situation such as frost killed foliage, etc.

Disputed fire management responsibility - Any wildland fire where responsibility for management is not agreed upon due to lack of agreements or different interpretations, etc.

Disputed fire policy – Example: differing fire policies between suppression agencies when a fire involves multiple ownership.

Pre-existing controversies - These may or may not be fire management related. Any controversy drawing public attention to an area may present unusual problems to the fire overhead and local management.

Have overhead overextended themselves mentally or physically? - This is a critical item that requires judgment by the responsible agency. It is difficult to write guidelines for this judgment because of the wide differences between individuals. If, however, the Agency Administrator feels the existing overhead cannot continue to function efficiently and take safe and aggressive action due to mental or physical reasons, assistance is mandatory.

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted **Yes/ No**

1. Burning Index (from on-site measurement of weather conditions predicted to be above the 90% level using the major fuel model in which the fire is burning. (**Adjective Class High or above).**

___ ___

2. Potential exists for "blowup" conditions (fuel moisture, winds, etc.). ___ ___

3. Crowning, profuse or long-range spotting. ___ ___

4. Weather forecast indicating no significant relief or worsening conditions. ___ ___

Total: ___ ___

B. RESOURCES COMMITTED

1. 200 or more personnel assigned. ___ ___

2. Three or more divisions. ___ ___

3. Wide variety of special support personnel. ___ ___

4. Substantial air operation which is not properly staffed. ___ ___

5. Majority of initial attack resources committed. ___ ___

Total ___ ___

C. RESOURCES THREATENED

1. Urban interface. ___ ___

2. Developments and facilities. ___ ___

3. Restricted, threatened or endangered species habitat .___ ___

4. Cultural sites. ___ ___

5. Unique natural resources, special designation zones or wilderness. ___ ___

6. Other special resources. ___ ___

Total ___ ___

D. SAFETY

1. Unusually hazardous fire line conditions. ___ ___

2. Serious accidents or facilities. ___ ___

3. Threat to safety of visitors from fire and related operations.___ ___

4. Restricted and/or closures in effect or being considered. ___ ___

5. No night operations in place for safety reasons. ___ ___

Total ___ ___

E. OWNERSHIP **Yes/No**

1. Fire burning or threatening more than one jurisdiction. ___ ___

2. Potential for claims (damages). ___ ___

3. Conflicting management objectives. ___ ___

4. Disputes over fire management responsibility. ___ ___

5. Potential for unified command. ___ ___

Total ___ ___

F. EXTERNAL INFLUENCES

1. Controversial wildland fire management policy. ___ ___

2. Pre-existing controversies/relationships. ___ ___

3. Sensitive media relationships. ___ ___

4. Smoke management problems. ___ ___
5. Sensitive political interests. ___ ___
6. Other external influences. ___ ___

Total ___ ___

G. CHANGE IN STRATEGY

1. Change in strategy to control from confine or contain. ___ ___
2. Large amount of unburned fuel within planned perimeter. ___ ___
3. WFSA invalid or requires updating. ___ ___

Total ___ ___

H. EXISTING OVERHEAD

1. Worked two operational periods without achieving initial attack objectives. ___ ___
2. Existing management organization ineffective. ___ ___
3. IMT overextended themselves mentally and/or physically. ___ ___
4. Incident action plans, briefings, etc., missing or poorly prepared. ___ ___

Total ___ ___

Signature_____

Date_____ Time_____

Appendix H
Wildland Fire Situation Analysis (WFSA)

Section I, WFSA Information Page (*This page is completed by the Agency Administrator(s).*

A. Jurisdiction(s): *Assign the agency or agencies that have or could have fire protection responsibility, e.g., USFWS, BLM, etc.*

B. Geographic Area: *Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northeast, Southeast, Southern, Northwest, Northern Rockies, etc.*

C. Unit(s): *Designate the local administrative unit(s), e.g., Assateague Island National Seashore.*

D. WFSA #: *Identify the number assigned to the most recent WFSA for this fire.*

E. Fire Name: *Self-explanatory*.

F. Incident #: *Identify the incident number assigned to the fire*.

G. Accounting Code: *Insert the local unit's accounting code.*

H. Date/Time Prepared: *Self-explanatory.*

I. Attachments: *Check here to designate items used to complete the WFSA. "Other could include data or models used in the development of the WFSA. Briefly describe the "other" items used.*

I. Wildland Fire Situation Analysis	
To be completed by the Agency Administrator(s)	
A. Jurisdiction(s)	B. Geographic Area
C. Unit(s)	D. WFSA #
E. Fire Name	F. Incident #
G. Accounting Code:	
H. Date/Time Prepared _____@_____	
I. Attachments	

- Complexity Matrix/Analysis *
- Risk Assessment/Analysis *
  Probability of Success *
  Consequences of Failure *
- Maps *
- Decision Tree **
- Fire Behavior Projections *
- Calculations of Resource Requirements *
- Other (specify)

* Required

** Required by FWS

Section II. Objectives and Constraints (*This page is completed by the Agency Administrator(s).*

A. Objectives: Specify objectives that must be considered in the development of alternatives. Safety objectives for firefighters, aviation resources, and the public *must* receive the highest priority. Suppression objectives must relate to resource management objectives in the seashore's resource management plan.

Economic objectives could include closure of all or portions of an area, thus impacting the public, or impacts to transportation, communication, and resource values.

Environmental objectives could include management objectives for airshed, water quality, wildlife, etc.

Social objectives could include any local attitudes toward fire or smoke that might affect decisions on the fire.

Other objectives might include legal or administrative constraints which would have to be considered in the analysis of the fire situation, such as the need to keep the fire off other agency lands, etc.

B. Constraints: List constraints on wildland fire action. These could include constraints to designated wilderness, wilderness study areas, environmentally or culturally sensitive areas, irreparable damage to resources or smoke management/air quality concerns. Economic constraints, such as public and agency cost, could be considered here.

II. Objectives and Constraints

To be Completed by the Agency Administrator(s)

A. Objectives (Must be specific and measurable)

1. Safety

   - Public

   - Firefighter

2. Economic

3. Environmental

4. Social

5. Other

B. Constraints

Section III. Alternatives (*This page is completed by the Incident Commander.)*

A. Wildland Fire Management Strategy: Briefly describe the general wildland fire strategies for each alternative. Alternatives must meet resource management plan objectives.

B. Narrative: Briefly describe each alternative with geographic names, locations, etc., that would be used when implementing a wildland fire strategy. For example: "Contain within the Starvation Meadows' watershed by the first burning period."

C. Resources Needed: Resources described must be reasonable to accomplish the tasks described in Section III.B. It is critical to also look at the reality of the availability of these needed resources.

D. Final Fire Size: Estimated final fire size for each alternative at time of containment.

E. Estimated Contain/Control Date: Estimates of each alternative shall be made based on predicted weather, fire behavior, resource availability, and the effects of suppression efforts.

F. Cost: Estimate all incident costs for each alternative. Consider mop-up, rehabilitation, and other costs as necessary.

G. Risk Assessment: Probability of Success/Consequences of Failure: Describe probability as a percentage and list associated consequences for success and failure. Develop this information from models, practical experience, or other acceptable means. Consequences described will include fire size, days to contain, days to control, costs, and other information such as seashore closures and effect on critical habitat. Include fire behavior and long-term fire weather forecasts to derive this information.

H. Complexity: Assign the complexity rating calculated in "Fire Complexity Analysis" for each alternative, e.g., Type II, Type I.

I. Map: A map for each alternative should be prepared. The map will be based on the "Probability of Success/Consequences of Failure" and include other relative information.

III. Alternatives (*To be completed by FMO / IC*)			
[redacted]	A	B	C
A. Wildland Fire Strategy			
B. Narrative			
C. Resources needed			
Handcrews			
Engines			
Dozers			
Airtankers			
Helicopters			
Other			
D. Final Size			
E. Est. Contain/ Control Date			
F. Costs			
G. Risk Assessment			
- Probability of success			

- Consequence of failure			
H. Complexity			
I. Attach maps for each alternative			

Section IV. Evaluation of Alternatives (*This page is completed by the Agency Administrator(s), FMO and/or Incident Commander.)*

A. Evaluation Process: Conduct an analysis for each element of each objective and each alternative. Objectives shall match those identified in Section II.A. (Those listed are defaults only – not all will be applicable to every fire – add or delete as appropriate for each incident.) Use the best estimates available and quantify whenever possible. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, - 100 to +100, etc.) to each consideration, then arrives at a weighted average. If you have the ability to estimate dollar amounts for natural resource and cultural values, this data is preferred. Use those methods which are most useful to managers and most appropriate for the situation and agency. To be able to evaluate positive fire effects, the area must be included in the resource management plan and consistent with prescriptions and objectives of the fire management plan.

Sum of Economic Values: Calculate for each element the net effect of the rating system used for each alternative. This could include the balance of:
pluses (+) and minuses (-), numerical rating (-3 and +3), or natural and cultural resource values in dollar amounts. (Again, resource benefits may be used as part of the analysis process when the wildland fire is within a prescription consistent with approved Fire Management Plans and in support of the unit's Resource Management Plan.)

IV. Evaluation of Alternatives			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
A. Evaluation Process	A	B	C
Safety Firefighter			
Aviation			
Public			
Sum of Safety Values			
Economic			
Forage			
Improvements			
Recreation			
Timber			
Water			
Wilderness			
Wildlife			
Other (specify)			
3Sum of Economic Values			
Environmental			
Air			
Visual			
Fuels			
T & E Species			
Other (specify)			
Sum of Environmental Values			
Social			

Employment			
Public Concern			
Cultural			
Other (Specify)			
Sum of Social Values			
Other			

Section V. Analysis Summary (*This page is completed by the Agency Administrator(s) and Fire Manager and/or Incident Commander.)*

A. Compliance with Objectives: Prepare narratives that summarize each alternative's effectiveness in meeting each objective. Alternatives that do not comply with objectives are not acceptable. Narrative could be based on effectiveness and efficiency. For example: "most effective and least efficient," "least effective and most efficient," or "effective and efficient." Or answers could be based on a two-tiered rating system such as "complies with objective" and "fully complies with or exceeds objective." Use a system that best fits the manager's needs.

B. Pertinent Data: Data for this Section has already been presented, and is duplicated here to help the Agency Administrator(s) confirm their selection of an alternative. Final Fire Size is displayed in Section III.D. Complexity is calculated in the attachments and displayed in Section III.H. Costs are displayed on page 4. Probability of Success/Consequences of Failure is calculated in the attachments and displayed in Section III.G.

C. External and Internal Influences: Assign information and data occurring at the time the WFSA is signed. Identify the Preparedness Index (1 through 5) for the National and Geographic levels. If available, indicate the Incident Priority assigned by the MAC Group. Designate the Resource Availability status. This information is available at the Geographic Coordination Center, and is needed to select a viable alternative. Designate "yes," indicating an up-to-date weather forecast has been provided to, and used by, the Agency Administrator(s) to evaluate each alternative. Assign information to the "Other" category as needed by the Agency Administrator(s).

Section IV. Decision

Identify the alternative selected. Their must be a clear and concise rationale for the decision, and a signature with date and time. Agency Administrator(s) signature is mandatory.

V. Analysis Summary			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
Alternatives	A	B	C
A. Compliance with Objectives			
Safety			
Economic			
Environmental			
Social			
Other			
B. Pertinent Data			
Final Fire Size			
Complexity			
Suppression Cost			
Resource Values			
Probability of Success			
Consequences of Failure			
C. External / Internal Influences			
National & Geographic Preparedness Level _____ Incident Priority _____ Resource Availability _____			

Weather Forecast
(long-range)

_____

Fire Behavior Projections

_____

VI. Decision

The Selected Alternative is:

_____

Rationale:

_____ _____

Agency Administrator's Signature Date/Time

APPENDIX I

LIMITED DELEGATION OF AUTHORITY

Delegation of Authority

If an Incident Commander is one of the resources ordered, the transfer of responsibility for suppression actions on the fire will be done only through a Limited Delegation of Authority signed by the Superintendent or designated Acting. It is the responsibility of the Seashore Fire Coordinator to prepare the Limited Delegation of Authority for the Superintendent's signature. (The Area Fire Management Officer may assist in this development)

LIMITED DELEGATION OF AUTHORITY

Memorandum

To: _____, Incident Commander

From: Superintendent, Assateague Island National Seashore
Subject: Limited Delegation of Authority

As of _____ hours, on this date _____, I have delegated limited authority to manage the _____ fire, number _____, in Assateague Island National Seashore.

As Superintendent I have the ultimate responsibility for protection of the seashore's resources and the lives of seashore visitors and employees. Your expertise in the area of wildfire incident management will assist me in fulfilling that responsibility during the present situation.

My considerations for management of this fire are:

1. Provide for firefighter, visitor, resident and adjacent agency safety. *This consideration is to receive top priority in all decision making evolutions.*

2. I would like the fire managed under a _____ strategy with the suppression actions done with as little environmental damage as possible. Attached are Minimum Impact Suppression Guidelines.

3. Key cultural features requiring priority protection are:
   _____
   _____

4. Key resource considerations are: _____
   _____
   _____

5. Restrictions for suppression actions are: no tracked or wheeled vehicles off of established roads except where roads exist that are identified for emergency use. Helicopters, powersaws, portable pumps, and leaf blowers may be used as required. Chemical retardant is authorized as stipulated in the Seashore's Fire Management Plan.

6. My agency Advisor/Representative will be _____.

7. Managing the fire cost effectively for the values at risk is a significant concern.

8. Providing training opportunities for seashore personnel is requested to strengthen our organizational capabilities.

9. Minimum disruption of visitor access to the seashore consistent with public safety.

(Signed)

_____
Superintendent, Assateague Island National Seashore

Date: _____

APPENDIX J

Minimum Impact Suppression Tactics Guidelines

MINIMUM IMPACT SUPPRESSION TACTICS (MIST)

The change in emphasis from fire control to fire management has added a new perspective to the role of fire manager and firefighter. The old objective of putting the fire "dead-out", by a specified period of time has been replaced by the need to make unique decisions for each fire start, to consider the land and resource objectives, and to decide the appropriate management response and tactics which result in minimum costs and resource damage. Fire management activities within the seashore will be carried out in a manner that minimizes impacts to the seashore's natural and cultural resources. Incident facilities, when practical, will be located outside of natural and historic zones. Suppression forces will choose methods and equipment commensurate with suppression needs and a strategy that will least alter the landscape or disturb seashore resources. Of primary importance is the need to impress upon suppression forces the minimum impact suppression guidelines found in RM-18, Chapter 9. These guidelines take the National Park Service preservation ethic into account during firefighting practices; they are not an excuse to relax normal safe firefighting practices. Techniques and policies of minimum impact firefighting that will be used at the seashore include (but are not limited to):

a. Minimize use of retardant. The seashore's aquatic ecosystems require protection for various reasons. Tidal areas support a diverse fish population with state-listed species, plus some of the most diverse aquatic insect populations in the area. **As a result, it will be standard practice to keep chemical retardant use at <u>least</u> 200 yards from any water source.**

b. Cold-trailing the fire edge when practical.

c. Use of natural firebreaks or wet lines wherever possible (in lieu of handline construction). Water bars will be constructed on all handline on steep slopes (15%>).

d. Use of soaker hose or foggers in mop-up to avoid "boring" and hydraulic action on soils.

e. Fireline kept to the minimum width needed to allow backfiring, burnout, or the creation of a safe backline. Natural barriers should be used wherever possible.

f. Minimal tree-falling. Snags within or adjacent to fireline will be removed only if they show evidence of fire, present hazard to firefighters, or constitute a legitimate threat to the fireline integrity. Living trees will be undisturbed whenever possible. Lower branches will be limbed whenever possible to remove ladder fuels rather than removing the tree.

g. Maximize archeological protection measures in order to protect cultural resources.

h. Debris scattered or removed as prescribed by the Resource Advisor.

i. All fire lines, camps, or other disturbance in visually sensitive areas will be rehabilitated to maintain a natural appearance.

j. After the fire emergency is over, transport of personnel, equipment, and trash out of the area, consistent with existing resource management objectives.

k. Engines used only on established roads within seashore boundaries, unless approval from the Superintendent or FMO has been obtained to leave seashore roads.

l. Bulldozers and tractor plows will be allowed only with written authorization from the Superintendent, who may authorize their use when high value resources are at risk. In these cases, Archeologists, Para-archeologists and/or Natural Resource Specialists will be assigned (if possible) to minimize damage to resources.

m. Utilize a "consumption strategy" when dealing with mop-up operations. This minimizes the exposure of firefighters to the physical hazards present along fire lines, i.e.; falling snags, rolling material, stump holes, etc., and allows for opportunities for the fire to consume fuels inside of the line without placing firefighters at unnecessary risk. Firefighters can monitor particularly hazardous areas along the line by initiating patrol actions from outside the line. Maximize the opportunity for the fire to consume fuels inside of the line without extensive mop-up activity by crews. The use of this strategy does NOT imply that the fire is left to its own devices, but rather that a coordinated approach of mop-up activity is utilized that allows for minimum exposure to firefighters during this phase of the fire suppression effort.

n. Using resource maps, ensure, to the maximum extent possible, Streamside Management Zones (SMZ's) are protected according to the buffer zone protection limits established for each. This will be accomplished through a variety of tactical choices that preserve existing vegetation located within each of the designated areas.

APPENDIX K

Five-Year Fuels Management Plan

Note: Target Acres were determined through C-SET (Course Scale Evaluation Technology).

Prescribed Fire/ Hazard Fuel Unit Data

Alpha	WUI/RM CS or HF	Planning Year	Project Name	Activity Type	Treat Type	NEPA	Target Acres
ASIS	HF	YR01	Hungerford	Monitoring	Fire/Non-Fire	Within FMP NEPA	63.8
ASIS	HF	YR02	Hungerford	Treatment	Fire/Non-Fire	Within FMP NEPA	63.8
ASIS	HF	YR03	Hungerford	Monitoring	Fire/Non-Fire	Within FMP NEPA	63.8
ASIS	HF	YR04	Hungerford	Monitoring	Fire/Non-Fire	Within FMP NEPA	63.8
ASIS	HF	YR05	Hungerford	Treatment	Fire/Non-Fire	Within FMP NEPA	63.8
ASIS	HF	YR01	High Winds Lodge	Monitoring	Non-Fire	Within FMP NEPA	0.31
ASIS	HF	YR02	High Winds Lodge	Treatment	Non-Fire	Within FMP NEPA	0.31
ASIS	HF	YR03	High Winds Lodge	Monitoring	Non-Fire	Within FMP NEPA	0.31
ASIS	HF	YR04	High Winds Lodge	Monitoring	Non-Fire	Within FMP NEPA	0.31
ASIS	HF	YR05	High Winds Lodge	Monitoring	Non-Fire	Within FMP NEPA	0.31
ASIS	HF	YR01	Peoples-Lynch	Monitoring	Non-Fire	Within FMP NEPA	0.4
ASIS	HF	YR02	Peoples-Lynch	Treatment	Non-Fire	Within FMP NEPA	0.4
ASIS	HF	YR03	Peoples-Lynch	Monitoring	Non-Fire	Within FMP NEPA	0.4
ASIS	HF	YR04	Peoples-Lynch	Monitoring	Non-Fire	Within FMP NEPA	0.4
ASIS	HF	YR05	Peoples-Lynch	Monitoring	Non-Fire	Within FMP NEPA	0.4
ASIS	HF	YR01	Jackson-Green Run	Monitoring	Fire/Non-Fire	Within FMP NEPA	122.7
ASIS	HF	YR02	Jackson-Green Run	Treatment	Fire/Non-Fire	Within FMP NEPA	122.7
ASIS	HF	YR03	Jackson-Green Run	Monitoring	Fire/Non-Fire	Within FMP NEPA	122.7
ASIS	HF	YR04	Jackson-Green Run	Monitoring	Fire/Non-Fire	Within FMP NEPA	122.7
ASIS	HF	YR05	Jackson-Green Run	Treatment	Fire/Non-Fire	Within FMP NEPA	122.7
ASIS	HF/CS	YR01	NB Life-Saving Station	Monitoring	Non-Fire	Within FMP NEPA	0.2
ASIS	HF/CS	YR02	NB Life-Saving Station	Treatment	Non-Fire	Within FMP NEPA	0.2
ASIS	HF/CS	YR03	NB Life-Saving Station	Monitoring	Non-Fire	Within FMP NEPA	0.2
ASIS	HF/CS	YR04	NB Life-Saving Station	Monitoring	Non-Fire	Within FMP NEPA	0.2
ASIS	HF/CS	YR05	NB Life-Saving Station	Monitoring	Non-Fire	Within FMP NEPA	0.2

Legend

Primary Objective(s) to be accomplished:

WUI Wildland Urban Interface Protection
RM Resource Management
CS Cultural Scene Protection/ Restoration/ Enhancement
HF Hazardous Fuel Reduction
FIRE Prescribed Fire
NON-FIRE Hazard Fuel Reduction (Manual/ herbicide/ combination)

Assateague Island National Seashore (ASIS)
Fuels Treatment Unit Designations
PROPOSED NON-FIRE / PRESCRIBED FIRE TREATMENT AREAS

Unit	Primary Fuel Model(s)	Acres	Treatment Objectives
Hungerford	1(5%) 3(5%) 4(20%) 9(70%)	63.8	Reduce hazard fuels to protect structure from wildland fire. Maintain/ enhance cultural scene
High Winds Lodge	9 (40%) 1(10%) 4(50%)	0.31	Reduce hazard fuel loading adjacent to structures; restore and maintain cultural scene.
Peoples-Lynch	9 (40%) 4(55%) 3(5%)	0.4	Hazardous fuel reduction. Reduce hazard fuels adjacent to structures; restore and maintain cultural scene.
Jackson-Green Run	9 (60%) 3(15%) 4(25%)	122.7	Reduce hazard fuels to protect structures from wildland fire; restore and enhance cultural scene.
North Beach Life-Saving Station	4 (80%) 1(10%) 9(10%)	0.2	Reduce hazard fuels around structure; maintain cultural scene of the Life-Saving Station and immediate vicinity.

Assateague Island National Seashore (ASIS) PROPOSED PRESCRIBED FIRE/ NON-FIRE FUEL TREATMENT UNITS

Name of the Unit: Hungerford
Area: 63.8 acres
Type of Burn: Early Spring/ backfire/ strip-head fire ignitions
Fuels: Forest fuels (litter, dead and down), shrub/ scrub and saplings/ various herbaceous species/ grasses, sedges, etc
Purpose of the Burn: Reduce hazard fuels as a means to protect structure from the potential adverse effects of a catastrophic wildland fire. Maintain cultural scene.

Vegetation Type	Acres	Hectares	
Loblolly/ mixed hardwood forest, scrub/ shrub in mid-story, grasses, forbs in understory.	63.8		
TOTAL	**63.8**		
Geology / Soils	Shallow, hillocked , moderately well drained, generally of the Brockatonorton Sand 2-5% slope association. Also Askecksy Loamy Sand association.		
Water Resources	Open water to north and west (marsh).		
Flood Plain / Wetlands	Marsh		
Vegetation	Loblolly Pine, mixed hardwoods, common shrubs/ herbaceous species/ grasses		
Wildlife / Fisheries	Species typical of coastal estuarine habitat.		
Threatened / Endangered / Sensitive Species	**Animals**	Piping Plover Nests 200 m east	
	Plants	None known	
Proposed Wilderness	No		

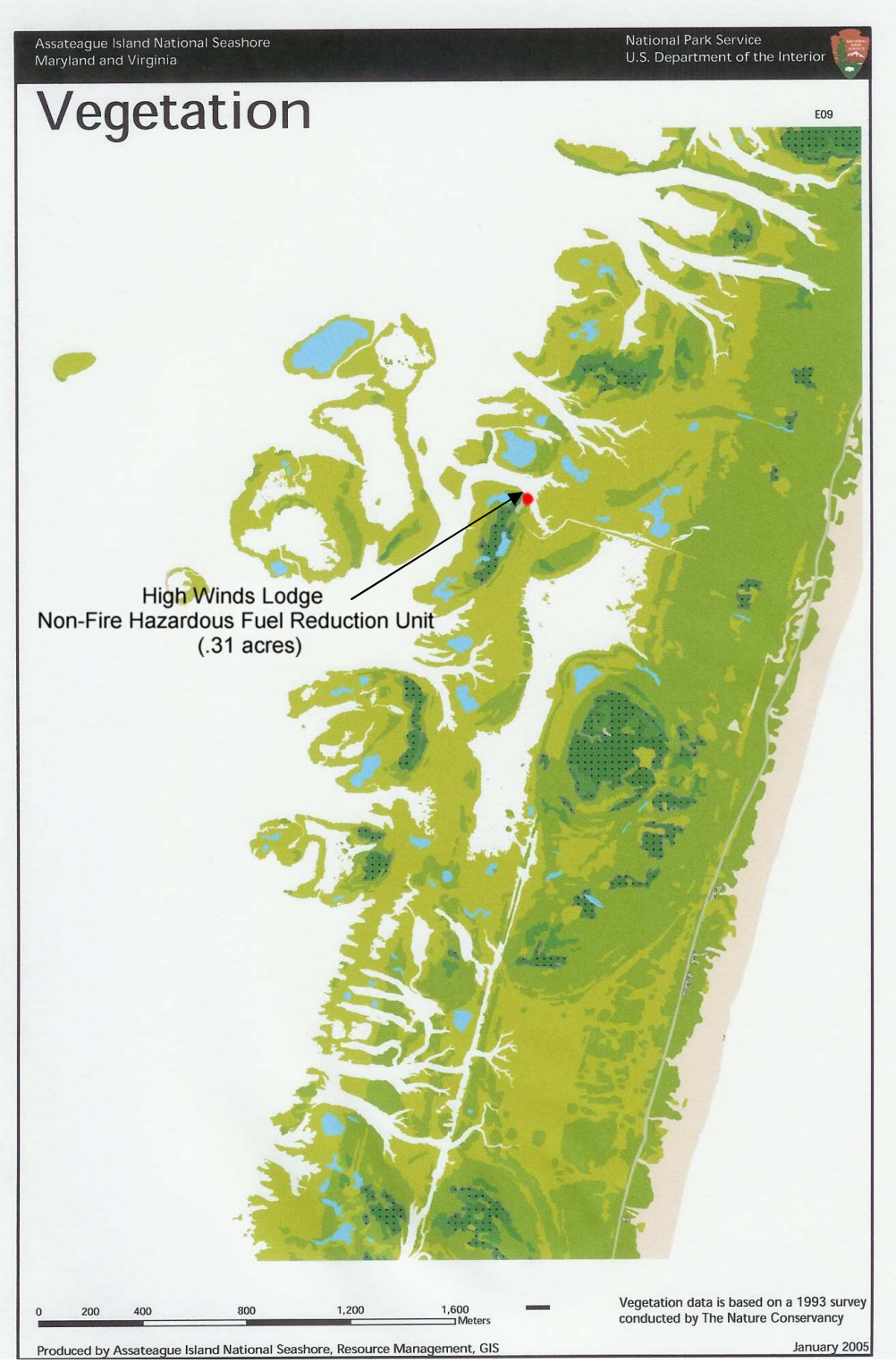
Hungerford Unit



Name of the Unit: High Winds Lodge
Area: 0.31 acres
Type of Treatment: Manual cutting and removal of hazard fuels adjacent to structure(s). Provide minimum 30-40 ft. distance from flammable fuels.
Fuels: Individual occurrences of shrubs (Myrica), grasses/ forbs/ sedges/ leaf litter
Purpose of the Treatment: Reduce hazard fuel loading adjacent to structures, restore and maintain cultural scene. (Trim/ remove black pine present at site {dependent upon cultural resource direction})

Vegetation Type	Acres	Hectares	
Trees, shrubs and grasses/ forbs	0.31		
TOTAL	**0.31**		
Geology / Soils	Shallow, nearly level, moderately to poorly drained, generally of the Brockatonorton Sand 0-2% slope association. Also Askecksy Loamy Sand association.		
Water Resources	Marsh and diked impoundments South, East, and North.		
Flood Plain / Wetlands	Estuarine and diked freshwater.		
Vegetation	Trees (Pinus spp.)Shrubs (Myrica), common herbaceous species and grasses.		
Wildlife / Fisheries	Species typical of coastal estuarine habitat.		
Threatened / Endangered / Sensitive Species	**Animals**	None Known	
	Plants	None Known	
Proposed Wilderness	No		

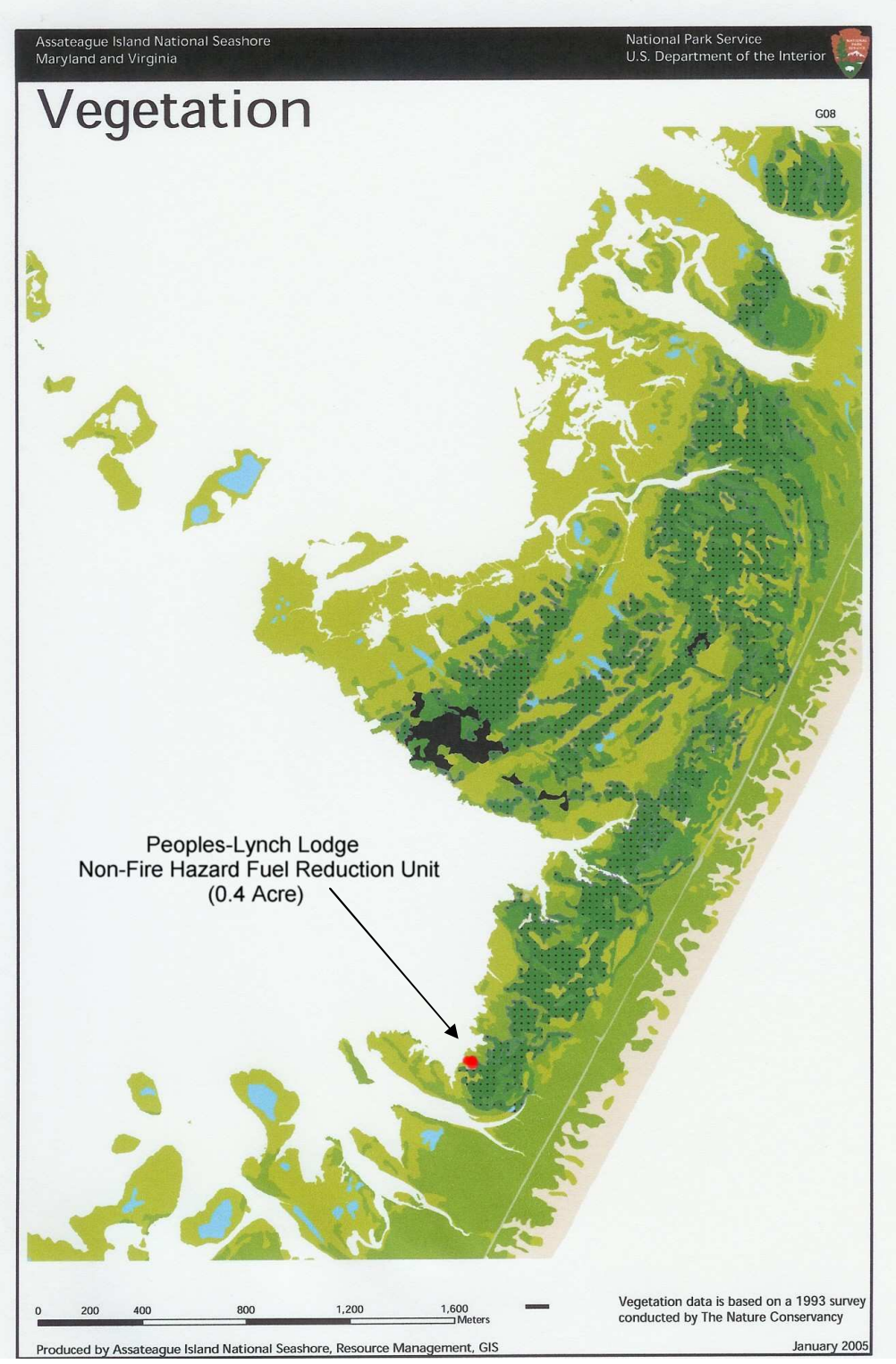
High Winds Lodge Unit



Name of the Unit: Peoples- Lynch
Area: 0.4 acres
Type of Treatment: Non-fire treatment Hazard fuel reduction /mechanical thinning and reduction of shrubs (Myrica), assorted trees species (red cedar, loblolly, hardwood (Quercus spp). Remove/ trim black pine (cultural resource direction).
Fuels: Shrubs, needle cast, fine fuels, standing dead and down pine resulting from wind-throw.
Purpose of the Treatment: These types of fuels present a significant risk to wildland fire (if an ignition were to occur in drought conditions with a crown fire resulting; nearby structures would be at considerable risk). Thin overstocked stands x 2/3; pile and burn resultant dead and down. Burning to take place during winter months or when snow covers the ground. Remove brush 30-40 ft back from structure

Vegetation Type	Acres	Hectares	
Shrubs, dead and down woody debris, grasses, forbs	0.4		
TOTAL	**0.4**		
Geology / Soils			
Water Resources	Open water marsh to N and W.		
Flood Plain / Wetlands	Estuarine wetland adjacent		
Vegetation	Mixed loblolly, hardwood, shrub, marsh grasses and sedges.		
Wildlife / Fisheries	Wildlife typical of coastal estuarine habitat.		
Threatened / Endangered / Sensitive Species	**Animals**	None Known	
	Plants	None Known	
Proposed Wilderness	No		

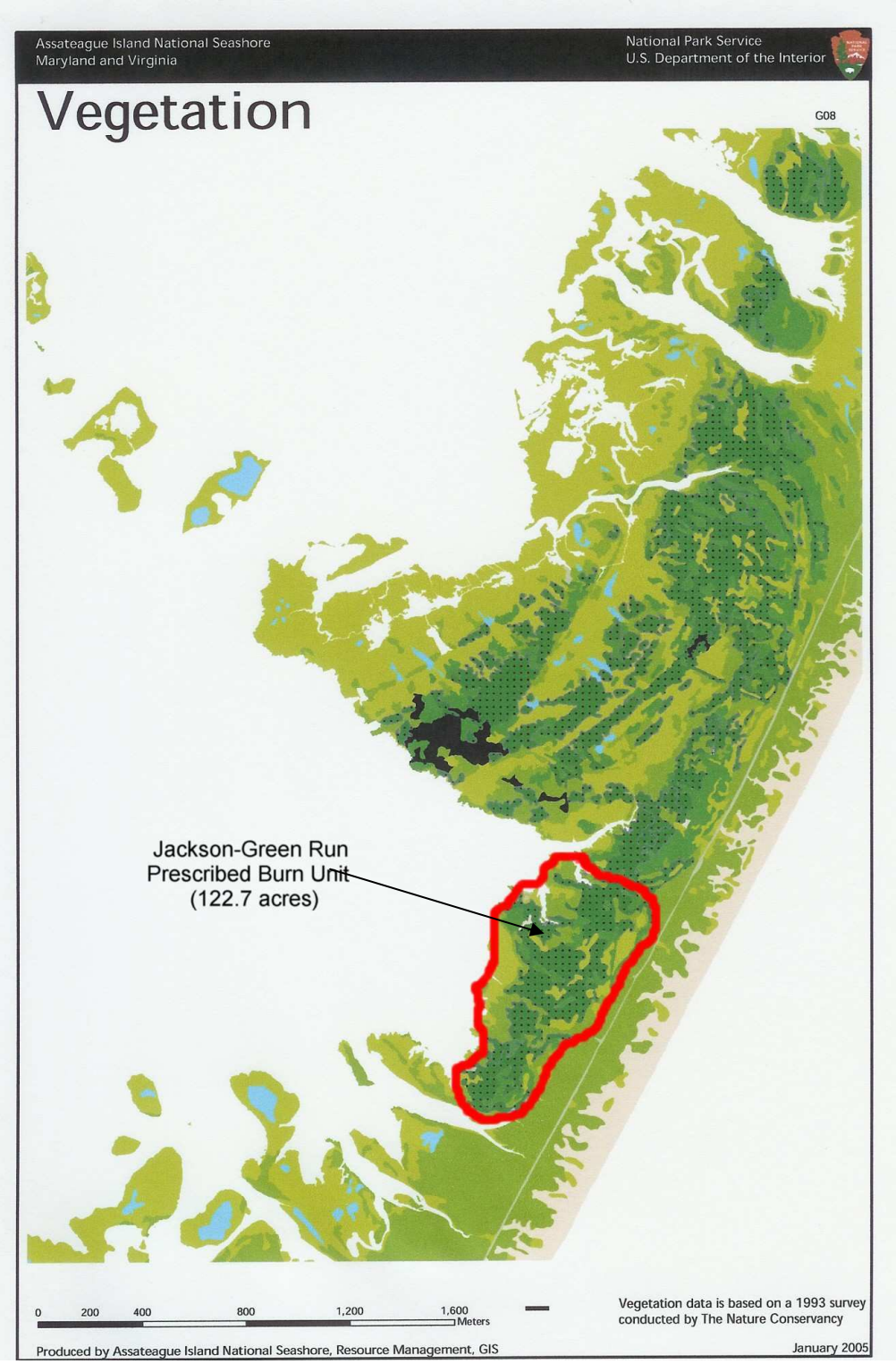
Peoples-Lynch Unit



Name of the Unit: Jackson-Green Run
Area: 122.7 acres
Type of Burn: Early Spring/ backfire/ strip-head fire ignitions
Fuels: Forest fuels (litter, dead and down), shrub/ scrub and saplings/ various herbaceous species/ grasses, sedges, etc.
Purpose of the Burn: Reduce hazard fuels as a means to protect structures from the potential adverse effects of a catastrophic wildland fire. Maintain and enhance, where applicable, the extant cultural scene.

Vegetation Type	Acres	Hectares	
Loblolly/ mixed hardwood forest, scrub/ shrub in mid-story, grasses, forbs in understory, invasive species.	122.7		
TOTAL	**122.7**		
Geology / Soils	Shallow, slightly hillocky, moderately well drained, generally of the Brockatonorton Sand 2-5% slope association. Also Askecksy Loamy Sand association.		
Water Resources	Open water marsh to N.		
Flood Plain / Wetlands	Coastal estuarine marsh adjacent.		
Vegetation	See above		
Wildlife / Fisheries	Wildlife typical of coastal estuarine habitat.		
Threatened / Endangered / Sensitive Species	**Animals**	Bald Eagle (within 500m)	
	Plants	None Known	
Proposed Wilderness	No		

Jackson – Green Run Unit



Name of the Unit: North Beach Life-Saving Station
Area: 0.2 acres
Type of Treatment: Non-fire (manual) removal of hazardous fuels.
Fuels: Shrubs mixed with some herbaceous species; a few scattered woody species. Native and invasive species present.
Purpose of the Treatment: Protect structure from potential effects of wildland fire. Clear fuel-free defensible zone around structure to a 30-40 ft buffer. Remove any invasive species found. Preserve/ enhance cultural scene.

Vegetation Type	Acres	Hectares	
Shrubs, various herbaceous species, intermixed with scattered woody species	0.2		
TOTAL	**0.2**		
Geology / Soils	Beaches soil type		
Water Resources	None		
Flood Plain / Wetlands	None		
Vegetation	See above		
Wildlife / Fisheries	Sika deer, white-tailed deer, feral horses		
Threatened / Endangered / Sensitive Species	**Animals**	None known	
	Plants	None Known	
Proposed Wilderness	No		

North Beach Life Saving Station Unit



APPENDIX L

HISTORIC FUELS TREATMENT MAPS

and

FIRE HISTORY

(1978 – 2005)

Assateague Island National Seashore Fire History

Fire Name	Discovery Date	Cause	Final Fire Size
Main Lot	July 23, 1978	Unknown	0.1
Green Run	Aug 3, 1980	Unknown	1.0
Bayside	Aug 12, 1984	Unknown	2.0
McCabe Gut	June 12, 1986	Training Accident	3.0
Big Levels	June 22, 1986	Unknown	2.4
FWSASIS1	May 28, 1988	Smoking	0.1
FWSASIS2	Aug 6, 1988	Misc	0.1
Tingles	Aug 6, 1988	Campfire	4.0
Tingles2	Aug 16, 1988	Lightning	20.0
Pine Tree	June 2, 1990	Campfire	0.1
Fire Effects RX	March 20, 1994	Mgt Prescribed Burn	90.0
DC9	May 13, 2000	Campfire	0.1
CampfireII	Sept 2, 2000	Campfire	0.1

Fire Effects Prescribed Burn, March 20, 1994

I. Burn Unit Description

Location: 1. T N/A , R_____, SEC_____
2. Latitude N 38° . 07' ,

Longitude W 75° . 10'

3. UTM Zone 18 , Easting 485389 , Northing 4218566

Size: Unit 1(N) 83 acres

Unit 2(N) 40.7 acres

Elevation: 0-15'

Description of Boundaries: The units to be burned are two of four that are part of the Assateague Island NS fire effects study. The units are between the Verrazano Bridge near the north end of ASIS and Chincoteague Natl. Wildlife Refuge to the south; approximately three miles north of the Maryland/Virginia state line. The four units are designated, from south to north, as 2(S), 2(N), 1(S), and 1(N). The two units designated "N" are to be burned, while the two designated "S" are left as controls. The units are bounded on the east by the north-south running backtrail - a sand trail passable by 4W-drive vehicles. Salt marsh on the west side of the island (on Chincoteague Bay) form the west boundary of the unit. The north and south boundaries of the two burn units are defined by guts that cut the island nearly to the backtrail. A brushed fire break separates units 2(S) and 2(N).

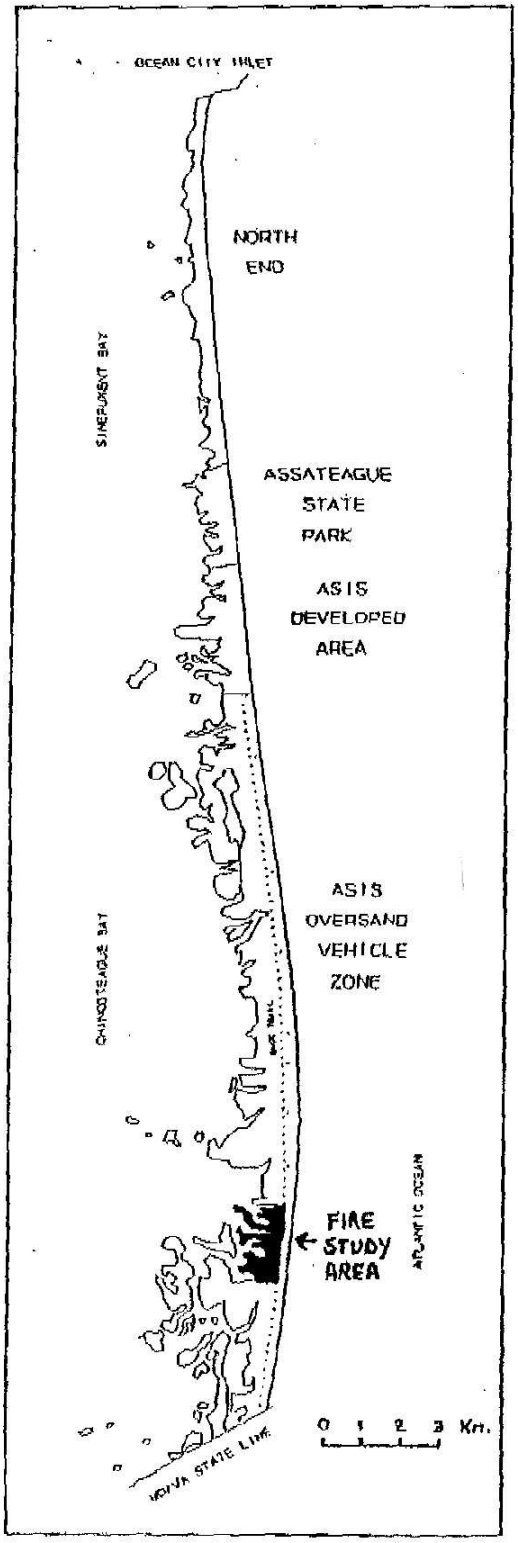
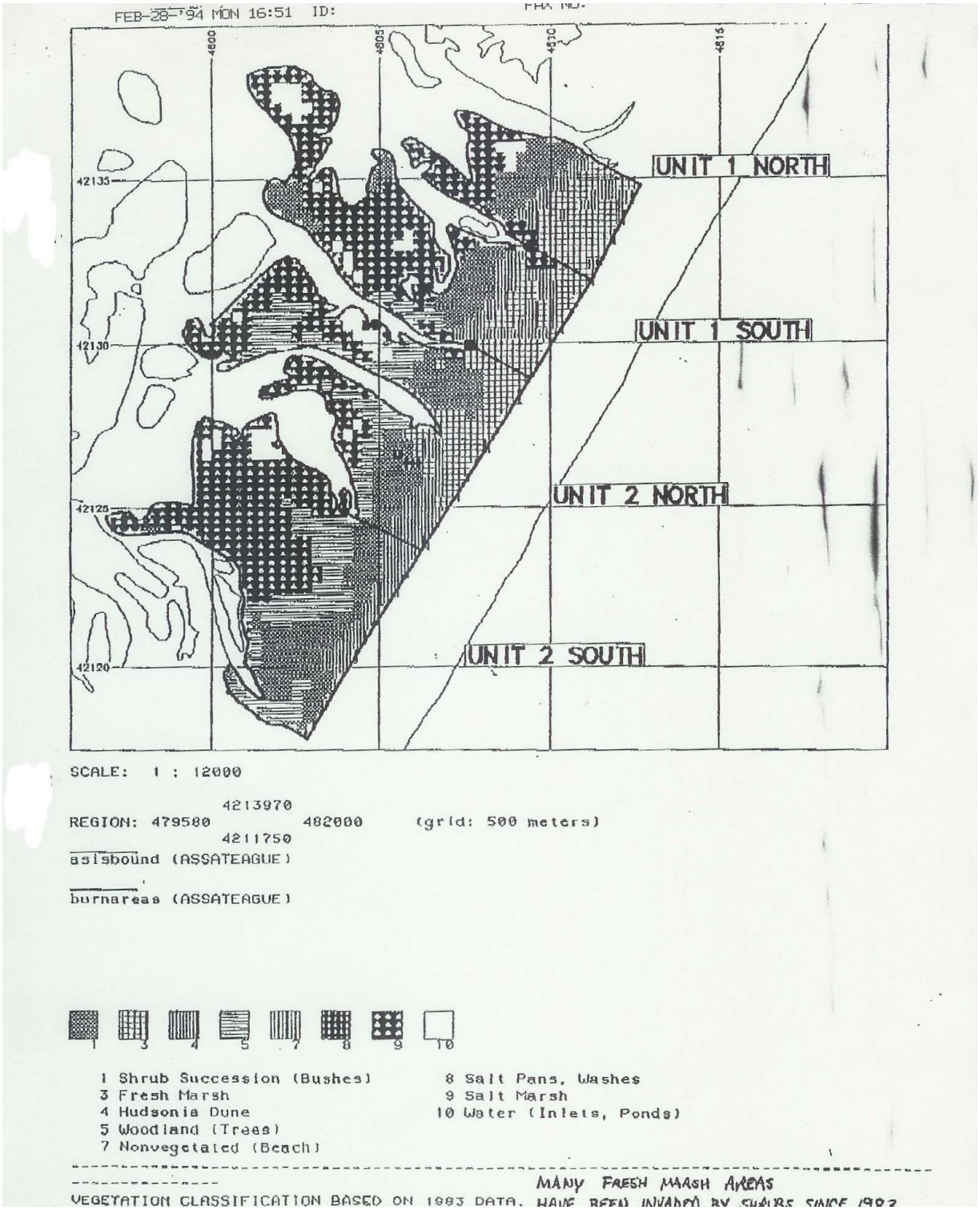


Diagram of the Maryland portion of Assateague Island.

Fire Effects Prescribed Burn Units Map



APPENDIX M

STATE EMISSION STANDARDS FOR OPEN BURNING (Maryland and Virginia)

Virginia State Emission Standards for Open Burning

STATIONARY SOURCES.
COMMONWEALTH OF VIRGINIA
STATE AIR POLLUTION CONTROL BOARD
REGULATIONS FOR THE CONTROL AND ABATEMENT OF AIR POLLUTION

9 VAC 5 CHAPTER 40.
EXISTING STATIONARY SOURCES

EXISTING PART II
Emission Standards

ARTICLE 40
Emission Standards For Open Burning (Rule 4-40)

9 VAC 5-40-5600. Applicability.
9 VAC 5-40-5610. Definitions.
9 VAC 5-40-5620. Open burning prohibitions.
9 VAC 5-40-5630. Permissible open burning.
9 VAC 5-40-5631. Forest management and agricultural practices.
9 VAC 5-40-5640. Repealed.
9 VAC 5-40-5641. Local ordinances on open burning.
9 VAC 5-40-5645. Waivers.

9 VAC 5-40-5600. Applicability.

A. Except as provided in subsection C of this section, the provisions of this article apply to any person who permits or engages in open burning or who permits or engages in burning using special incineration devices.

B. The provisions of this article apply throughout the Commonwealth of Virginia.

C. The provisions of this article do not apply to such an extent as to prohibit the burning of leaves by persons on property where they reside if the local governing body of the county, city or town in which such persons reside has enacted an otherwise valid ordinance (under the provisions of _ 10.1-1308 of the Virginia Air Pollution Control Law) regulating such burning in all or any part of the locality.

9 VAC 5-40-5610. Definitions.

A. For the purpose of these regulations and subsequent amendments or any orders issued by the board, the words or terms shall have the meaning given them in subsection C of this section.

B. As used in this article, all terms not defined here shall have the meaning given them in 9 VAC 5 Chapter 10 (9 VAC 5-10-10 et seq.), unless otherwise required by context.

C. Terms defined:

"Automobile graveyard" means any lot or place which is exposed to the weather and upon which more than five motor vehicles of any kind, incapable of being operated, and which it would not be economically practical to make operative, are placed, located or found.

"Built-up area" means any area with a substantial portion covered by industrial, commercial or residential buildings.

"Clean burning waste" means waste which does not produce emissions of greater than 40% opacity when burned and which is not prohibited to be burned under this article.

"Commercial waste" means all waste generated by establishments engaged in business operations. This category includes, but is not limited to, waste resulting from the operation of stores, markets, office buildings, restaurants and shopping centers.

"Construction waste" means solid waste which is produced or generated during construction of structures. Construction waste consists of lumber, wire, sheetrock, broken brick, shingles, glass, pipes, concrete, and metal and plastics if the metal or plastics are a part of the materials of construction or empty containers for such materials. Paints, coatings, solvents, asbestos, any liquid, compressed gases or semi-liquids, and garbage are not construction wastes and the disposal of such materials shall be in accordance with the regulations of the Virginia Waste Management Board.

"Debris waste" means stumps, wood, brush, and leaves from land clearing operations.

"Demolition waste" means that solid waste which is produced by the destruction of structures and their foundations and includes the same materials as construction waste.

"Garbage" means rotting animal and vegetable matter accumulated by a household in the course of ordinary day-to-day living.

"Hazardous waste" means refuse or combination of refuse which, because of its quantity, concentration or physical, chemical or infectious characteristics may:

a. Cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating illness; or

b. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed, or otherwise managed.

"Household refuse" means waste material and trash normally accumulated by a household in the course of ordinary day-to-day living.

"Industrial waste" means all waste generated on the premises of manufacturing and industrial operations such as, but not limited to, those carried on in factories, processing plants, refineries, slaughter houses, and steel mills.

"Junk" means old or scrap copper, brass, rope, rags, batteries, paper, trash, rubber, debris, waste, or junked, dismantled, or wrecked automobiles, or parts thereof, iron, steel, and other old or scrap ferrous or nonferrous material.

"Junkyard" means an establishment or place of business which is maintained, operated, or used for storing, keeping, buying, or selling junk, or for the maintenance or operation of an automobile graveyard, and the term shall include garbage dumps and sanitary fills.

"Landfill" means a sanitary landfill, an industrial waste landfill, or a construction/demolition/debris landfill. See Part I (9 VAC 20-80-10 et seq.) of 9 VAC 20 Chapter 80 (Solid Waste Management Regulations) for further definitions of these terms.

"Local landfill" means any landfill located within the jurisdiction of a local government.

"Open burning" means the burning of any matter in such a manner that the products resulting from combustion are emitted directly into the atmosphere without passing through a stack, duct or chimney.

"Open pit incinerator" means a device used to burn waste for the primary purpose of reducing the volume by removing combustible matter. Such devices function by directing a curtain of air at an angle across the top of a trench or similarly enclosed space, thus reducing the amount of combustion by-products emitted into the atmosphere. The term also includes trench burners, air curtain destructors and over draft incinerators.

"Refuse" means trash, rubbish, garbage and other forms of solid or liquid waste, including, but not limited to, wastes resultant from residential, agricultural, commercial, industrial, institutional, trade, construction, land clearing, forest management and emergency operations.

"Salvage operation" means any operation consisting of a business, trade or industry participating in salvaging or reclaiming any product or material, such as, but not limited

to, reprocessing of used motor oils, metals, chemicals, shipping containers or drums, and specifically including automobile graveyards and junkyards.

"Sanitary landfill" means an engineered land burial facility for the disposal of household waste which is so located, designed, constructed, and operated to contain and isolate the waste so that it does not pose a substantial present or potential hazard to human health or the environment. A sanitary landfill also may receive other types of solid wastes, such as commercial solid waste, nonhazardous sludge, hazardous waste from conditionally exempt small quantity generators, and nonhazardous industrial solid waste. See Part I (9 VAC 20-80-10 et seq.) of 9 VAC 20 Chapter 80 (Solid Waste Management Regulations) for further definitions of these terms. "Smoke" means small gas-borne particulate matter consisting mostly, but not exclusively, of carbon, ash and other material in concentrations sufficient to form a visible plume. "Special incineration device" means a pit incinerator, conical or teepee burner, or any other device specifically designed to provide good combustion performance.

9 VAC 5-40-5620. Open burning prohibitions.

A. No owner or other person shall cause or permit open burning of refuse or use of special incineration devices except as provided in 9 VAC 5-40-5630.

B. No owner or other person shall cause or permit open burning or the use of a special incineration device for disposal of rubber tires, asphaltic materials, crankcase oil, impregnated wood or other rubber or petroleum based materials except when conducting bona fide fire fighting instruction at fire fighting training schools having permanent facilities.

C. No owner or other person shall cause or permit open burning or the use of a special incineration device for disposal of hazardous waste or containers for such materials.

D. No owner or other person shall cause or permit open burning or the use of a special incineration device for the purpose of a salvage operation or for the disposal of commercial/industrial waste.

E. Open burning or the use of special incineration devices permitted under the provisions of this article does not exempt or excuse any owner or other person from the consequences, liability, damages or injuries which may result from such conduct; nor does it excuse or exempt any owner or other person from complying with other applicable laws, ordinances, regulations and orders of the governmental entities having jurisdiction, even though the open burning is conducted in compliance with this article. In this regard special attention should be directed to _ 10.1-1142 of the Code of Virginia, which is enforced by the Department of Forestry.

F. With regard to the provisions of subsection E of this section, special attention should also be directed to the regulations of the Virginia Waste Management Board. No disposal of waste by open burning or transportation of waste to be disposed of by open burning shall take place in violation of the regulations of the Virginia Waste Management Board.

G. Upon declaration of an alert, warning or emergency stage of an air pollution episode as described in 9 VAC 5 Chapter 70 (9 VAC 5-70-10 et seq.) or when deemed advisable by the board to prevent a hazard to, or an unreasonable burden upon, public health or welfare, no owner or other person shall cause or permit open burning or use of a special incineration device; and any in-process burning or use of special incineration devices shall be immediately terminated in the designated air quality control region.

9 VAC 5-40-5630. Permissible open burning.

Open burning or the use of special incineration devices is permitted in the following instances provided the provisions of subsections B through G of 9 VAC 5-40-5620 are met:

1. Upon the request of an owner or a responsible civil or military public official, the board may approve open burning or the use of special incineration devices under controlled conditions for the elimination of a hazard which constitutes a threat to the public health, safety or welfare and which cannot be remedied by other means consonant with the circumstances presented by the hazard. Such uses of open burning or the use of special incineration devices may include, but are not limited to, the following:

a. Destruction of deteriorated or unused explosives and munitions on government or private property when other means of disposal are not available.

b. Disposal of debris caused by floods, tornadoes, hurricanes or other natural disasters where alternate means of disposal are not economical or practical and when it is in the best interest of the citizens of the Commonwealth.

2. Open burning is permitted for training and instruction of government and public fire fighters under the supervision of the designated official and industrial in-house fire fighting personnel with clearance from the local fire fighting authority. The designated official in charge of the training shall notify and obtain the approval of the regional director prior to conducting the training exercise. Training schools where permanent facilities are installed for fire fighting instruction are exempt from this notification requirement.

3. Open burning or the use of special incineration devices is permitted for the destruction of classified military documents under the supervision of the designated official.

4. Open burning is permitted for camp fires or other fires that are used solely for recreational purposes, for ceremonial occasions, for outdoor noncommercial preparation of food, and for warming of outdoor workers provided the materials specified in subsections B and C of 9 VAC 5-40-5620 are not burned.

5. In urban areas, open burning is permitted for the disposal of leaves and tree, yard and garden trimmings located on the premises of private property, provided that no regularly scheduled public or private collection service for such trimmings is available at the adjacent street or public road. In non-urban areas, open burning is permitted for the disposal of leaves

and tree, yard and garden trimmings located on the premises of private property regardless of the availability of collection service for such trimmings.

6. Open burning is permitted for the disposal of household refuse by homeowners or tenants, provided that no regularly scheduled public or private collection service for such refuse is available at the adjacent street or public road.

7. Open burning is permitted for the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack. Use of a flare or flare stack for the destruction of hazardous waste or commercial/industrial waste is allowed provided written approval is obtained from the board and the facility is in compliance with Article 3 (9 VAC 5-40-160 et seq.) of this chapter and Article 3 (9 VAC 5-50-160 et seq.) of 9 VAC 5 Chapter 50. Permits issued under 9 VAC 5 Chapter 80 (9 VAC 5-80-10 et seq.) may be used to satisfy the requirement for written approval.

8. Open burning or the use of special incineration devices is permitted for disposal of clean burning construction waste, debris waste, and demolition waste resulting from property maintenance, from the development or modification of roads and highways, parking areas, railroad tracks, pipelines, power and communication lines, buildings or building areas, sanitary landfills, or from any other clearing operations. Buildings which have not been demolished may be burned only as provided in subdivision 2 of this section. Open burning for the purpose of such disposal is prohibited in the Northern Virginia Volatile Organic Compounds Emissions Control Area (see 9 VAC 5-20-206) during June, July, and August. As of January 1, 2000, open burning for the purpose of such disposal is prohibited in the Richmond and Hampton Roads Volatile Organic Compounds Emissions Control Areas (see 9 VAC 5-20-206) during June, July, and August.

9. Open burning is permitted for forest management and agriculture practices approved by the board (see 9 VAC 5-40-5631), provided the following conditions are met:

a. The burning shall be at least 1000 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted; and

b. The burning shall be attended at all times.

10. Open burning or the use of special incineration devices is permitted for disposal of clean burning construction waste, debris waste, and demolition waste on the site of local landfills provided that the burning does not take place on land that has been filled and covered so as to present an underground fire hazard due to the presence of methane gas. Open burning for the purpose of such disposal is prohibited in the Northern Virginia Volatile Organic Compounds Emissions Control Area (see 9 VAC 5-20-206) during June, July, and August. As of January 1, 2000, open burning for the purpose of such disposal is prohibited in the Richmond and Hampton Roads Volatile Organic Compounds Emissions Control Areas (see 9 VAC 5-20-206) during June, July, and August.

9 VAC 5-40-5631. Forest management and agricultural practices

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A. Open burning is permitted in accordance with subsections B and C of this section provided the provisions of subsections B through G of 9 VAC 5-40-5620 are met.

B. Open burning may be used for the following forest management practices provided the burning is conducted in accordance with the Department of Forestry's smoke management plan:

1. To reduce forest fuels and minimize the effect of wild fires.

2. To control undesirable growth of hardwoods.

3. To control disease in pine seedlings.

4. To prepare forest land for planting or seeding.

5. To create a favorable habitat for certain species.

6. To remove dead vegetation for the maintenance of railroad, highway and public utility right-of-way.

C. In the absence of other means of disposal, open burning may be used for the following agricultural practices:

1. To destroy undesirable vegetation.

2. To clear orchards and orchard prunings.

3. To destroy fertilizer and chemical containers.

4. To denature seed and grain which may no longer be suitable for agricultural purposes.

5. To prevent loss from frost or freeze damage.

6. To create a favorable habitat for certain species.

7. To destroy strings and plastic ground cover remaining in the field after being used in growing staked tomatoes.

9 VAC 5-40-5640. Repealed.

9 VAC 5-40-5641. Local ordinances on open burning.

A. General.

1. If the governing body of any locality wishes to adopt an ordinance governing open burning within its jurisdiction, the ordinance must first be approved by the board (see _ 10.1-1321 B of the Code of Virginia).

2. In order to assist local governments in the development of ordinances acceptable to the board, the ordinance in subsection C of this section is offered as a model.

3. If a local government wishes to adopt the language of the model ordinance without changing any wording except that enclosed by parentheses, that government's ordinance shall be deemed to be approved by the board on the date of local adoption provided that a copy of the ordinance is filed with the department upon its adoption by the local government.

4. If a local government wishes to change any wording of the model ordinance aside from that enclosed by parentheses in order to construct a local ordinance, that government shall request the approval of the board prior to adoption of the ordinance by the local jurisdiction. A copy of the ordinance shall be filed with the department upon its adoption by the local government.

5. Local ordinances which have been approved by the board prior to April 1, 1996, remain in full force and effect as specified by their promulgating authorities.

B. Establishment and approval of local ordinances varying from the model.

1. Any local governing body proposing to adopt or amend an ordinance relating to open burning which differs from the model local ordinance in subsection C of this section shall first obtain the approval of the board for the ordinance or amendment as specified in subdivision A 4 of this section. The board in approving local ordinances will consider, but will not be limited to, the following criteria:

a. The local ordinance shall provide for intergovernmental cooperation and exchange of information.

b. Adequate local resources will be committed to enforcing the proposed local ordinance.

c. The provisions of the local ordinance shall be as strict as state regulations, except as provided for leaf burning in _ 10.1-1308 of the Virginia Air Pollution Control Law.

d. If a waiver from any provision of Article 40 (9 VAC 5-40-5600 et seq.) of 9 VAC 5 Chapter 40 has been requested under 9 VAC 5-40-5640, the language of the ordinance shall achieve the objective of the provision from which the waiver is requested.

2. Approval of any local ordinance may be withdrawn if the board determines that the local ordinance is less strict than state regulations or if the locality fails to enforce the ordinance.

3. If a local ordinance must be amended to conform to an amendment to state regulations, such local amendment will be made within six months of the effective date of the amended state regulations.

4. Local ordinances are a supplement to state regulations. Any provisions of local ordinances which have been approved by the board and are more strict than state regulations shall take precedence over state regulations within the respective locality. If a locality fails to enforce its own ordinance, the board reserves the right to enforce state regulations.

5. A local governing body may grant a variance to any provision of its air pollution control ordinance(s) provided that:

a. A public hearing is held prior to granting the variance;

b. The public is notified of the application for a variance by notice in at least one major newspaper of general circulation in the affected locality at least 30 days prior to the date of the hearing; and

c. The variance does not permit any owner or other person to take action that would result in a violation of any provision of state regulations unless a variance is granted by the board. The public hearings required for the variances to the local ordinance and state regulations may be conducted jointly as one proceeding.

6. 9 VAC 5-20-60 shall not apply to local ordinances concerned solely with open burning.

C. Model Ordinance.

ORDINANCE NO. (000)

Section (000-1). Title. This article shall be known as the (local jurisdiction) Ordinance for the Regulation of Open Burning.

Section (000-2). Purpose. The purpose of this article is to protect public health, safety, and welfare by regulating open burning within (local jurisdiction) to achieve and maintain, to the greatest extent practicable, a level of air quality that will provide comfort and convenience while promoting economic and social development. This article is intended to supplement the applicable regulations promulgated by the State Air Pollution Control Board and other applicable regulations and laws.

Section (000-3). Definitions. For the purpose of this article and subsequent amendments or any orders issued by (local jurisdiction), the words or phrases shall have the meaning given them in this section.

A. "Automobile graveyard" means any lot or place which is exposed to the weather and upon which more than five motor vehicles of any kind, incapable of being operated, and which it would not be economically practical to make operative, are placed, located or found.

B. "Clean burning waste" means waste which does not produce dense smoke when burned and is not prohibited to be burned under this ordinance.

C. "Construction waste" means solid waste which is produced or generated during construction of structures. Construction waste consists of lumber, wire, sheetrock, broken brick, shingles, glass, pipes, concrete, and metal and plastics if the metal or plastics are a part of the materials of construction or empty containers for such materials. Paints, coatings, solvents, asbestos, any liquid, compressed gases or semi-liquids, and garbage are not construction wastes and the disposal of such materials must be in accordance with the regulations of the Virginia Waste Management Board.

D. "Debris waste" means stumps, wood, brush, and leaves from land clearing operations.

E. "Demolition waste" means that solid waste which is produced by the destruction of structures and their foundations and includes the same materials as construction waste.

F. "Garbage" means rotting animal and vegetable matter accumulated by a household in the course of ordinary day-to-day living.

G. "Hazardous waste" means refuse or combination of refuse which, because of its quantity, concentration or physical, chemical or infectious characteristics may:

1. Cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating illness; or

2. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed, or otherwise managed.

H. "Household refuse" means waste material and trash normally accumulated by a household in the course of ordinary day-to-day living.

I. "Industrial waste" means all waste generated on the premises of manufacturing and industrial operations such as, but not limited to, those carried on in factories, processing plants, refineries, slaughter houses, and steel mills.

J. "Junkyard" means an establishment or place of business which is maintained, operated, or used for storing, keeping, buying, or selling junk, or for the maintenance or operation of an automobile graveyard, and the term shall include garbage dumps and sanitary fills.

K. "Landfill" means a sanitary landfill, an industrial waste landfill, or a construction/demolition/debris landfill. See Solid Waste Management Regulations (9 VAC 20-80-10 et seq.) for further definitions of these terms.

L. "Local landfill" means any landfill located within the jurisdiction of a local government.

M. "Open burning" means the burning of any matter in such a manner that the products resulting from combustion are emitted directly into the atmosphere without passing through a stack, duct or chimney.

N. "Open pit incinerator" means a device used to burn waste for the primary purpose of reducing the volume by removing combustible matter. Such devices function by directing a curtain of air at an angle across the top of a trench or similarly enclosed space, thus reducing the amount of combustion byproducts emitted into the atmosphere. The term also includes trench burners, air curtain destructors and over draft incinerators.

O. "Refuse" means trash, rubbish, garbage and other forms of solid or liquid waste, including, but not limited to, wastes resulting from residential, agricultural, commercial, industrial, institutional, trade, construction, land clearing, forest management and emergency operations.

P. "Salvage operation" means any operation consisting of a business, trade or industry participating in salvaging or reclaiming any product or material, such as, but not limited to, reprocessing of used motor oils, metals, chemicals, shipping containers or drums, and specifically including automobile graveyards and junkyards.

Q. "Sanitary landfill" means an engineered land burial facility for the disposal of household waste which is so located, designed, constructed, and operated to contain and 4-40: 12 isolate the waste so that it does not pose a substantial present or potential hazard to human health or the environment. A sanitary landfill also may receive other types of solid wastes, such as commercial solid waste, nonhazardous sludge, hazardous waste from conditionally exempt small quantity generators, and nonhazardous industrial solid waste. See Solid Waste Management Regulations (9 VAC 20-80-10 et seq.) for further definitions of these terms.

R. "Smoke" means small gas-borne particulate matter consisting mostly, but not exclusively, of carbon, ash and other material in concentrations sufficient to form a visible plume.

S. "Special incineration device" means a pit incinerator, conical or teepee burner, or any other device specifically designed to provide good combustion performance.

Section (000-4). Prohibitions on open burning.

A. No owner or other person shall cause or permit open burning or the use of a special incineration device for disposal of refuse except as provided in this ordinance.

B. No owner or other person shall cause or permit open burning or the use of a special incineration device for disposal of rubber tires, asphaltic materials, crankcase oil, impregnated wood or other rubber or petroleum based materials except when conducting bona fide fire fighting instruction at fire fighting training schools having permanent facilities.

C. No owner or other person shall cause or permit open burning or the use of a special incineration device for disposal of hazardous waste or containers for such materials.

D. No owner or other person shall cause or permit open burning or the use of a special incineration device for the purpose of a salvage operation or for the disposal of commercial/industrial waste.

E. Open burning or the use of special incineration devices permitted under the provisions of this ordinance does not exempt or excuse any owner or other person from the consequences, liability, damages or injuries which may result from such conduct; nor does it excuse or exempt any owner or other person from complying with other applicable laws, ordinances, regulations and orders of the governmental entities having jurisdiction, even though the open burning is conducted in compliance with this ordinance. In this regard special attention should be directed to _ 10.1-1142 of the Forest Fire Law of Virginia, the regulations of the Virginia Waste Management Board, and the State Air Pollution Control Board's Regulations for the Control and Abatement of Air Pollution.

F. Upon declaration of an alert, warning or emergency stage of an air pollution episode as described in 9 VAC 5 Chapter 70 (9 VAC 5-70-10 et seq.) or when deemed advisable by the State Air Pollution Control Board to prevent a hazard to, or an unreasonable burden upon, public health or welfare, no owner or other person shall cause or permit open burning or use of a special incineration device; and any in process burning or use of special incineration devices shall be immediately terminated in the designated air quality control region.

Section (000-5). Exemptions. The following activities are exempted to the extent covered by the State Air Pollution Control Board's Regulations for the Control and Abatement of Air Pollution:

A. Open burning for training and instruction of government and public fire fighters under the supervision of the designated official and industrial in-house fire fighting personnel;

B. Open burning for camp fires or other fires that are used solely for recreational purposes, for ceremonial occasions, for outdoor noncommercial preparation of food, and for warming of outdoor workers;

C. Open burning for the destruction of any combustible liquid or gaseous material by burning in a flare or flare stack;

D. Open burning for forest management and agriculture practices approved by the State Air Pollution Control Board; and

E. Open burning for the destruction of classified military documents.

Section (000-6). Permissible open burning.

A. Open burning is permitted for the disposal of leaves and tree, yard and garden trimmings located on the premises of private property, provided that the conditions are met:

1. The burning takes place on the premises of the private property; (and)

2. The location of the burning is not less than 300 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted (and)

3. No regularly scheduled public or private collection service for such trimmings is available at the adjacent street or public road[1]).

B. Open burning is permitted for the disposal of household refuse by

[1]*This provision shall be included in ordinances for urban areas. It may be included in ordinances for non-urban areas.*

homeowners or tenants, provided that the following conditions are met:

1. The burning takes place on the premises of the dwelling;

2. Animal carcasses or animal wastes are not burned;

3. Garbage is not burned (and)

4. The location of the burning is not less than 300 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted (and)

5. No regularly scheduled public or private collection service for such refuse is available at the adjacent street or public road[2]).

C. Open burning is permitted for disposal of debris waste resulting from property maintenance, from the development or modification of roads and highways, parking areas, railroad tracks, pipelines, power and communication lines, buildings or building areas, sanitary landfills, or from any other clearing operations which may be approved by (designated local official), provided the following conditions are met:

1. All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles approved by (designated local official);

2. The material to be burned shall consist of brush, stumps and similar debris waste and shall not include demolition material;

3. The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;

4. The burning shall be conducted at the greatest distance practicable from highways and air fields,

5. The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;

6. The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and

7. The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

[2]*This provision shall be included in ordinances for urban areas. It may be included in ordinances for non-urban areas*.

D. Open burning is permitted for disposal of debris on the site of local landfills provided that the burning does not take place on land that has been filled and covered so as to present an underground fire hazard due to the presence of methane gas provided that the following conditions are met:

1. The burning shall take place on the premises of a local sanitary landfill which meets the provisions of the regulations of the Virginia Waste Management Board;

2. The burning shall be attended at all times;

3. The material to be burned shall consist only of brush, tree trimmings, yard and garden trimmings, clean burning construction waste, clean burning debris waste, or clean burning demolition waste;

4. All reasonable effort shall be made to minimize the amount of material that is burned;

5. No materials may be burned in violation of the regulations of the Virginia Waste Management Board or the State Air Pollution Control Board. The exact site of the burning on a local landfill shall be established in coordination with the regional director and (designated local official); no other site shall be used without the approval of these

officials. (Designated local official) shall be notified of the days during which the burning will occur.

(E. Sections 000-6.A. through D. notwithstanding, no owner or other person shall cause or permit open burning or the use of a special incineration device during June, July, or August.[3])

Section (000-7). Permits.

A. When open burning of debris waste (Section 000-6.C.) or open burning of debris on the site of a local landfill (Section 000-6.D.) is to occur within (local jurisdiction), the person responsible for the burning shall obtain a permit from (designated local official) prior to the burning. Such a permit may be granted only after confirmation by (designated local official) that the burning can and will comply with the provisions of this ordinance and any other conditions which are deemed necessary to ensure that the burning will not endanger the public health and welfare or to ensure compliance with any applicable provisions of the State Air Pollution Control Board's Regulations for the Control and Abatement of Air Pollution. The permit may be issued for each occasion of burning or for a specific period of time deemed appropriate by (designated local official).

[3]This provision shall be included in ordinances for jurisdictions within volatile organic compound emissions control areas. It may be included in ordinances for jurisdictions outside these areas.

B. Prior to the initial installation (or reinstallation, in cases of relocation) and operation of special incineration devices, the person responsible for the burning shall obtain a permit from (designated local official), such permits to be granted only after confirmation by (designated local official) that the burning can and will comply with the applicable provisions in Regulations for the Control and Abatement of Air Pollution and that any conditions are met which are deemed necessary by (designated local official) to ensure that the operation of the devices will not endanger the public health and welfare. Permits granted for the use of special incineration devices shall at a minimum contain the following conditions:

1. All reasonable effort shall be made to minimize the amount of material that is burned. Such efforts shall include, but are not limited to, the removal of pulpwood, sawlogs and firewood.

2. The material to be burned shall consist of brush, stumps and similar debris waste and shall not include demolition material.

3. The burning shall be at least 300 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted; burning shall be conducted at the greatest distance practicable from highways and air fields. If (designated local official) determines that it is necessary to protect public health and welfare, he may direct that any of the above cited distances be increased.

4. The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced. Under no

circumstances should the burning be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials.

5. The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

6. The use of special incineration devices shall be allowed only for the disposal of debris waste, clean burning construction waste, and clean burning demolition waste.

7. Permits issued under this subsection shall be limited to a specific period of time deemed appropriate by (designated local official).

(C. An application for a permit under Section 000-7.A. or 000-7.B. shall be accompanied by a processing fee of $----.[4])

[4]*The fee stipulation in this section is optional at the discretion of the jurisdiction.*
4-40: 17

Section (000-8). Penalties for violation.

A. Any violation of this ordinance is punishable as a Class I misdemeanor. (See _ 15.1-901 of the Code of Virginia.)

B. Each separate incident may be considered a new violation.

9 VAC 5-40-5645. Waivers.

A. A waiver from any provision of this article may be granted by the board for any person or geographic area provided that satisfactory demonstration is made that another state or local government entity has in effect statutory provisions or other enforceable mechanisms that will achieve the objective of the provision from which the waiver is granted.

B. Demonstrations made pursuant to subsection A of this section should, at a minimum, meet the following criteria:

1. The demonstration should show that the statutory provisions or other enforceable mechanisms essentially provide the same effect as the provision from which the waiver is granted.

2. That the governmental entity has the legal authority to enforce the statutory provisions or enforceable mechanisms.

C. Waivers under subsection A of this section shall be executed through a memorandum of understanding between the board and affected governmental entity and may include such terms and conditions as may be necessary to ensure that the objectives of this article are met by the waiver.

D. A waiver from any applicable provision of this article may be granted by the board for any locality which has lawfully adopted an ordinance in accordance with 9 VAC5-40-5641.

HISTORICAL NOTES:

Derived from: Rule 4-40 of Part IV or VR 120-01 (_ 120-04-4001 through _ 120-04-4005)

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26.11.07.00

Title 26 DEPARTMENT OF THE ENVIRONMENT

Subtitle 11 AIR QUALITY

Chapter 07 Open Fires

Authority: Environment Article, Title 2, Annotated Code of Maryland

26.11.07.01

.01 Definitions.

A. In this chapter, the following terms have the meanings indicated.

B. Terms Defined.

(1) "Excessive lodging" means a condition of farmland where embedding of the previous crop causes the normal use of harvesting, tillage, or planting equipment to be impossible or impracticable.

(2) "Forest resource management practices" means the technical application of scientific objectives that conserve, protect, and enhance the quality, quantity, productivity, and biological diversity of the forest resources of Maryland.

(3) "Open fire" means a fire where any material is burned in the open or in a receptacle other than a furnace, incinerator, or other equipment connected to a stack or chimney.

(4) "Public collection of refuse" means the service provided by any governmental agency or commercial enterprise for the pickup on a regularly scheduled basis of refuse from groups of individual homes, businesses, apartment buildings, or other establishments.

(5) "Safety determinations" means the testing, training, or demonstrations with explosives, propellants, incendiaries, or military devices involving an open flame.

26.11.06.02

.02 Visible Emissions.

A. General Exceptions.

(1) The visible emission standards set forth in §C of this regulation, do not apply to emissions from the installations or sources listed below:

(a) The burning of wood in fireplaces;

(b) Open fires (except salamanders) permitted under provisions of COMAR 26.11.07.03, .04, and .05;

(c) Fugitive emissions from iron and steel production installations in compliance with COMAR 26.11.10.03B;

(d) Fugitive emissions from metallurgical, slot-type, byproduct coke ovens in compliance with COMAR 26.11.10.03C;

(e) Emissions from grain drying and grain-handling installations in compliance with COMAR 26.11.18.03;

(f) Fugitive emissions from skull cracker oxygen lancing in compliance with COMAR 26.11.10.04C;

(g) Fugitive emissions from batch-type hot-dip galvanizing installations in compliance with COMAR 26.11.12.04;

(h) Confined emissions from glass melting furnaces and fugitive emissions from forming and post-forming equipment in compliance with COMAR 26.11.25.03;

(i) Emissions from food preparation installations subject to COMAR 26.11.18.06;

(j) Emissions at a federal facility or other facility under contract with a federal facility that result from testing, training, or demonstrations of explosives, obscurant materials, propellants, or other incendiary devices; or

(k) Sources in compliance with Regulation .03C and D of this chapter.

(2) The visible emissions standards in §C of this regulation do not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment, if:

(a) The visible emissions are not greater than 40 percent opacity; and

(b) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period.

B. Case-by-Case Exception to Visible Emissions Standards.

(1) Except as provided in §B(5) of this regulation, a person who owns or operates an existing installation subject to a visible emissions standard in §C of this regulation may request an exception. The request shall be submitted to the Department in writing and shall include the following:

(a) A description of the installation and all associated air pollution control devices;

(b) Process information, including operating parameters and the substances that cause or the substances that are suspected of causing the visible emissions;

(c) A demonstration, based on stack tests, a material balance, or other method of equivalent certainty that all other applicable regulations are met when the visible emissions occur;

(d) An analysis of any methods that may be available to reduce the visible emissions, the cost effectiveness of the methods, and the economic burden that would result from the use of these methods; and

(e) Any other information requested by the Department and relating to its determination to grant or deny an exception.

(2) The application for an exception to a visible emissions standard will be processed as follows:

(a) Within 10 working days, the Department will acknowledge receipt of an application for an exception to a visible emissions standard.

(b) Within 60 days after receipt of a completed application, the Department shall notify the applicant of its intent to proceed with the application or deny the request. The Department will make a determination to proceed if the conditions in §B(2)(c)(i)—(iii) and (d) of this regulation are met.

(c) Conditions.

(i) The applicant has provided an adequate demonstration that the installation for which a visible emissions exception is requested meets all other applicable air pollution control requirements within this subtitle when the visible emissions occur.

(ii) The applicant has demonstrated to the satisfaction of the Department that complying with the applicable visible emission standard would cause an unreasonable economic burden.

(iii) The applicant has demonstrated to the satisfaction of the Department that the applicant has sufficient control of the installation to be capable of meeting an alternative visible emission limit established by the Department.

(d) Test Methods. A person shall demonstrate compliance with all other applicable regulations, as required by §B(1)(c) of this regulation, through the use of:

(i) Applicable federally approved test methods in the Department's TM 91-01 "Test Methods and Equipment Specifications for Stationary Sources", which is incorporated by reference in COMAR 26.11.01.04C; or

(ii) Other compliance methods required under this subtitle that are federally enforceable.

(e) Test Methods for Visible Emissions. Compliance with any visible emissions or opacity standard in this subtitle, including any alternative opacity standard established pursuant to this section, shall be determined using applicable federally approved test methods in the Department's TM 91-01 "Test Methods and Equipment Specification for Stationary Sources", which is incorporated by reference in COMAR 26.11.01.04C, or any other applicable federally approved test method.

(3) Opportunity for Public Comment.

(a) Within 10 days after notification by the Department of a determination to proceed, the applicant shall notify the public, by local notice and by prominent advertisement in at least one newspaper of general circulation in the region where the applicant's source is located, of the opportunity to comment on the application.

(b) The advertisement shall be made at the applicant's expense and in a format approved by the Department, and shall include a summary of all the information in the application that was considered by the Department.

(4) Final Action on a Request for an Application.

(a) The Department will make a final determination on the application after considering any public comments.

(b) If an exception is granted, the Department will issue an order which establishes an alternative opacity standard applicable to the installation receiving the exception. The order may also include any conditions or requirements determined by the Department to be necessary to insure continuous compliance with the alternative standard.

(c) Exceptions may not be granted for a period of more than 5 years and may be renewed. In requesting a renewal of a visible emissions exception, the applicant shall submit an application and satisfy all the requirements in this regulation that relate to an initial exception request, including the opportunity for public comment required in §B(3) of this regulation.

(5) The Department or control officer may bypass the procedure above and may grant exceptions to visible emission requirements if the:

(a) Application of a visible emission requirement to a residential building housing two or fewer families creates undue economic hardship on individuals residing in it; or

(b) Equipment's primary way of transferring heat is by the radiant method rather than a piped fluid system such as forced hot air, hot water, or steam. Equipment in this category would include stoves, room heaters, floor or wall-mounted circulating heaters, or similar devices.

C. Visible Emission Standards.

(1) In Areas I, II, V, and VI a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is greater than 20 percent opacity.

(2) In Areas III and IV a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers.

26.11.07.03

.03 Control Officer May Authorize Certain Open Fires.

A. In Allegany, Caroline, Dorchester, Garrett, Kent, Queen Anne's, Somerset, St. Mary's, Talbot, Washington, Wicomico, and Worcester counties:

(1) Subject to review by the Department, the control officer, upon receipt of an application made on forms provided by the Department or local fire control agency, may issue or approve a permit in writing allowing an open fire, provided all of the following conditions are met:

(a) The control officer is satisfied that there is no practical alternate method to dispose of the material to be burned or to conduct the desired activities,

(b) A hazardous condition or air pollution or nuisance will not be created,

(c) Fire control laws or regulations of other governmental agencies will not be violated,

(d) Materials which produce dense smoke when burned, including, but not limited to, tires and roofing material, will not be burned,

(e) The material to be burned shall have originated on the premises on which it is to be burned;

(2) The control officer may impose other conditions to minimize creation of smoke, to prevent nuisances and air pollution, and to protect the health, safety, comfort, and property of any persons.

B. In Anne Arundel, Baltimore, Calvert, Carroll, Cecil, Charles, Frederick, Harford, Howard, Montgomery, and Prince George's counties and Baltimore City during the period September 1 through May 31 of the following year:

(1) Subject to review by the Department, the control officer, upon receipt of an application made on forms provided by the Department or local fire control agency, may issue or approve a permit in writing allowing an open fire, provided all of the following conditions are met:

(a) The control officer is satisfied that there is no practical alternate method for the disposal of the material to be burned or to conduct the desired activity.

(b) A hazardous condition or air pollution or nuisance will not be created.

(c) In Anne Arundel, Baltimore, Carroll, Harford, Howard, Montgomery, and Prince George's counties and Baltimore City, burning may not be done within 500 yards (457 meters) of one or more occupied buildings or heavily travelled public roadway.

(d) Fire control laws or regulations of other governmental agencies will not be violated,

(e) Materials which produce dense smoke when burned, including, but not limited to, tires and roofing material, will not be burned.

(f) All other conditions the control officer may impose to minimize creation of smoke, to prevent nuisances and air pollution, and to protect the health, safety, comfort, and property of any persons shall be satisfied,

(g) The material to be burned shall have originated on the premises on which it is to be burned;

(2) The following exceptions apply:

(a) Methods of disposal by burning acceptable to the Department may be approved for use when distance limitations cannot be met.

(b) A permit may be granted for fires set in the course of agricultural operations in growing crops or raising fowl or animals or in accepted forestry practice, when distance limitations cannot be met: this provision may not be construed as allowing the burning of ordinary household or barnyard trash in areas where provision is made for public collection of refuse.

C. Prohibition on Open Burning.

26.11.07.04

.04 Public Officers May Authorize Certain Fires.

Public officers, in the performance of their official duties, may set an open fire or give permission for an open fire, with concurrence of the control officer, if:

A. All reasonable means are employed to minimize smoke; and

B. The fire is necessary for one or more of the following reasons or purposes:

(1) For the prevention of a fire hazard that cannot be abated by other means;

(2) For the instruction of public fire fighters or industrial employees under supervision of the appropriate fire control official;

(3) For the protection of public health or safety when other means for disposing of hazardous waste materials are not available including the burning of hazardous waste authorized under federal law or COMAR 26.13.02.07;

(4) For burning pest-infested crops or products and agricultural burning that is necessary for animal disease control;

(5) For good forest resource management practices as approved by the Department of Natural Resources-Forest Service;

(6) For burning excessive lodging for the purpose of recropping as approved by the Department of Agriculture or local extension offices;

(7) For the purpose of testing fire fighter training systems fueled by natural gas or propane provided that the:

(a) Source maintains records of the total amount of fuel used and the date of the open fire,

(b) Total combined fuel usage for all systems at the premises does not exceed 5,000 gallons of propane and natural gas combined per week, and

(c) Open fire does not constitute a major source of VOC or NOx.

.05 Open Fires Allowed Without Authorization of Control Officer or Public Officer.

A. Except as provided in Regulation .03C of this chapter, in Allegany, Calvert, Caroline, Cecil, Charles, Dorchester, Garrett, Frederick, Kent, Queen Anne's, Somerset, St. Mary's, Talbot, Washington, Wicomico, and Worchester counties, open fires, in conformance with other governmental fire control ordinances and provided no nuisance or air pollution is created, are allowed without permission under Regulation .03 or .04 of this regulation as follows:

(1) In those areas where no provision is made for public collection of leaves, burning of leaves originating on the premises, by householders, is permitted, provided that leaves are not burned at locations closer than 200 feet (61 meters) from any neighboring habitable dwelling or place where people work or congregate;

(2) In those areas where no provision is made for public collection of refuse, burning of ordinary household trash originating on the premises, excluding commercial establishments, by householders is permitted provided that:

(a) Materials are not burned which create dense smoke (emissions of greater than 40 percent opacity), and

(b) Refuse may not be burned at locations closer than 200 feet (61 meters) from any neighboring habitable dwelling or place where people work or congregate;

(3) Cooking of food on other than commercial premises or cooking of food which is subject to COMAR 26.11.18.06;

(4) Fires set in the course of agricultural operations in growing crops or raising fowl or animals or in accepted forestry practice; this provision may not be construed as allowing the burning of ordinary household or barnyard trash in areas where provision is made for public collection of refuse;

(5) Recreational purposes, such as campfires;

(6) Oil or gas fired salamanders or similar devices designated specifically for space heating or warming outdoor workers, etc., provided no visible emissions are created;

(7) Warming fires for outdoor workers, provided smoke emissions are not darker in shade or appearance than those designated as greater than 40 percent opacity, and the fires are located no closer than 200 feet (61 meters) from any neighboring habitable building.

B. In Anne Arundel, Baltimore, Carroll, Harford, Howard, Montgomery, and Prince George's counties and Baltimore City and during the period from September 1 of any year through May 31 of the following year, open fires otherwise conforming to other governmental fire control ordinances, provided no nuisance or air pollution is created, are allowed without permission under Regulation .03 or .04 of this chapter as follows:

(1) In those areas where no provision is made for public collection of leaves, the open burning of leaves originating on the premises, by householders, is permitted, provided that no nuisance is created and that the fires are located no closer than 300 feet (91.4 meters) from any neighboring habitable dwelling or place where people work or congregate;

(2) In those areas where no provision is made for public collection of refuse, burning of ordinary household trash originating on the premises, excluding commercial establishments, by householders is permitted provided that:

(a) Materials are not burned which create dense smoke (emissions of greater than 40 percent opacity),

(b) The fires are located no closer than 300 feet (91.4 meters) from any neighboring habitable dwelling or place where people work or congregate;

(3) Cooking of food on other than commercial premises or cooking of food which is subject to COMAR 26.11.18.06;

(4) Recreational purposes, such as campfires;

(5) Oil or gas fired salamanders or similar devices designated specifically for space heating or warming of outdoor workers, etc., provided no visible emissions are created.

APPENDIX N

AGREEMENTS BETWEEN:

NATIONAL PARK SERVICE, ASSATEAGUE ISLAND NATIONAL SEASHORE AND

MARYLAND DEPARTMENT OF NATURAL RESOURCES (ASSATEAGUE STATE PARK)

U.S.FISH AND WILDLIFE SERVICE (TOMS COVE HOOK AREA ADMINISTRATION)

MARYLAND FOREST SERVICE

VIRGINIA DEPARTMENT OF FORESTRY

VOLUNTEER FIRE DEPARTMENT (TEMPLATE)

BERLIN VOLUNTEER FIRE COMPANY

COOPERATIVE MANAGEMENT AGREEMENT

**Cooperative Management Agreement
between the
National Park Service
and
Maryland Department of Natural Resources
for
the Cooperative Management
of
Assateague Island National Seashore
and
Assateague State Park**

This Cooperative Management Agreement ("Agreement") is entered into by and between the State of Maryland, acting through the Maryland Department of Natural Resources ("MD DNR") and the United States of America, acting through the National Park Service ("NPS").

ARTICLE I – BACKGROUND AND OBJECTIVES

The NPS manages certain federally-owned lands on Assateague Island and the adjacent mainland as part of Assateague Island National Seashore, a unit of the National Park System. These lands share common boundaries with state of Maryland-owned lands managed by the MD DNR as Assateague State Park. Both federal and state park lands are managed for the general purposes of resource protection, conservation and public outdoor recreation.

The NPS and MD DNR routinely collaborate to accomplish the purposes of the National Seashore and State Park. Since 1965, the parties have cooperated in the acquisition and management of portions of the "Woodcock Farm" to meet administrative and conservation goals for the mainland headquarters of both organizations. Portions of the current NPS headquarters property were donated by the MD DNR in 1992 to provide a site for a planned visitor education center.

The University of Maryland Eastern Shore ("UMES") has constructed a Coastal Ecology Teaching and Research Laboratory ("CETRL") on MD DNR property adjacent to the National Seashore Headquarters. To support the purposes of the Laboratory, the NPS agreed to provide potable and fire suppression water service, wastewater treatment, access and utility easements, roadways, and other infrastructure and operational support. To facilitate this support and provide the NPS with the land base needed to construct a future visitor education center physically aligned with the UMES facility, the MD DNR donated an additional 4.89 acres of property to the NPS in 2004.

The MD DNR-donated property is being developed by the NPS to meet the shared conservation, education and operational goals of UMES, MD DNR, and NPS . Development activities include

the upgrading and expansion of the NPS wastewater treatment plant to accommodate the CETRL and eliminate discharge into Sinepuxent Bay through the construction of de-nitrification ponds discharging into adjacent MD DNR constructed wetlands. Other actions include the expansion of support facilities and the re-alignment of roadways to improve visitor safety. The majority of the property will be used for the construction of a visitor education center, pending the availability of funds (currently programmed for fiscal year 2009).

The NPS and MD DNR desire to increase the level of cooperation in park management in order to improve operational efficiency and thereby enhance protection of park resources and service to the public. The statement of work, below, identifies specific actions that expand and formalize the cooperative relationship between the agencies.

ARTICLE II – AUTHORITY

Pursuant to 16 U.S.C. §1a-2(l), the NPS is authorized to cooperate with State and local park agencies for the more effective and efficient management of adjacent park areas, so long as the administrative responsibilities for any unit of the National Park System are not transferred.

ARTICLE III – STATEMENT OF WORK

A. All parties shall:

Cooperate fully in planning and operational activities that will, or are likely to, affect the planning or operations of the other party. Such planning and operational activities may include, but are not limited to, feral horse management, recreational management such as the development of trails, wastewater and storm water management facilities and operation, emergency management, educational programs and the development of visitor center exhibits, etc.

B. The NPS shall:

1. Transport and treat wastewater from Assateague State Park campground and day use bathhouse holding tanks numbers 1 through 9, exclusive of number 6. This annual wastewater system maintenance will be conducted in March or April of each year at a time determined by the respective Superintendents and Park Managers. Wastewater will be treated in the NPS wastewater treatment plant. Wastewater from bathhouse number 6 (which also serves as the recreational vehicle pump-out station) will remain the responsibility of the MD DNR.

2. Provide use of office space, use of classroom and auditorium space and up to 200 sq. ft. of exhibit space in the proposed NPS Visitor Education Center. The design and installation of exhibits by the MD DNR will be coordinated with the NPS. To the extent possible, and subject to available funds, exhibits will comply with the NPS standards for interior interpretive exhibits including format, style and content.

3. Conduct annual monitoring of the MD DNR constructed wetlands to ensure proper ecological functioning and to detect the presence of invasive plant specials.

4. MD DNR has conveyed a parcel consisting of 4.89 acres to NPS for use as wastewater treatment facilities to support the NPS Visitor Center . There is no reversionary interest in this land to MD DNR as NPS cannot give reversionary rights to lands held by the United States. In the event NPS no longer uses this land, NPS may consider returning this land to MD DNR.

C. The MD DNR shall:

1. Provide right of access to install and operate a wastewater effluent discharge line from the de-nitrification treatment ponds in the southwest corner of NPS parcel number 11-15 to the existing constructed wetland on MD DNR parcel 1-A. The location of the discharge line and design of the outfall will be designed by the NPS and approved prior to construction by the MD DNR.

2. Allow discharge of treated wastewater into the existing constructed wetland on MD DNR parcel 1-A. All such treated wastewater will comply with Federal and State water quality standards for above-ground discharge of treated wastewater.

ARTICLE IV – TERM OF AGREEMENT

This Cooperative Management Agreement shall terminate five years from the effective date hereof, unless prior thereto it is terminated pursuant to the provisions of Article XI hereof or of any applicable Federal or State law or regulation. The Agreement may be extended for additional periods with the concurrence of both parties.

ARTICLE V – KEY OFFICIALS

A. Key officials are essential to ensure maximum coordination and communications between the parties and the work being performed. They are:

1. **For the NPS:**

Superintendent
Assateague Island National Seashore
7206 National Seashore Lane
Berlin, MD 21822
(410) 641-1443, extension 209

2. **For the MD DNR:**

Assistant Secretary
Maryland Department of Natural Resources
Land and Property Management
580 Taylor Avenue, Section E-4
Annapolis, MD 21401
410-260-8446 or 410-260-8433

B. **Communications** – MD DNR and NPS will address any communication regarding this Agreement to the key officials.

ARTICLE VI – EXPENDITURE OF FUNDS

Nothing in this Agreement shall be construed as obligating the NPS or MD DNR to expend any funds in excess of appropriations authorized by law. The commitment of funds in furtherance of this Agreement shall be authorized by individual task agreements. When the work to be accomplished and the work program are mutually agreed upon by all parties, an appropriate task agreement shall be consummated, obligating funds where necessary. Whenever a transfer of funds is specified, the relevant implementing task agreement shall include a description of the project, the authority for the expenditure/transfer, the specific funding source and amount(s) and names, addresses and telephone numbers for contact re: billing questions. Overhead rates will be waived, but direct expenses will be reimbursed by the NPS and MD DNR.

ARTICLE VII – PRIOR APPROVAL

Not applicable.

ARTICLE VIII – LIABILITY

The parties accept responsibility for any property damage, injury or death, caused by the acts or omissions of their respective employees, acting within the scope of their employment, to the fullest extent permitted by law.

ARTICLE IX – REPORTS AND/OR OTHER DELIVERABLES

Not Applicable.

ARTICLE X – PROPERTY UTILIZATION

Any tools, equipment, material, or other property supplied by NPS shall remain the property of

the NPS. Similarly, any tools, equipment, material, or other property supplied by MD DNR shall remain the property of the State of Maryland.

ARTICLE XI – MODIFICATION AND TERMINATION

A. This Agreement may be modified only by a written instrument executed by the parties.

B. Any party may terminate its participation in this Agreement by providing thirty (30) days written notice to the other parties.

ARTICLE XII – STANDARD CLAUSES

1. **Non-Discrimination -** All activities pursuant to this Agreement shall be in compliance with the requirements of Executive Order 11246; Title VI of the *Civil Rights Act of 1964*, as amended, (78 Stat. 252; 42 U.S.C. §§2000d et seq.); Title V, Section 504 of the *Rehabilitation Act of 1973*, as amended, (87 Stat. 394; 29 U.S.C. §794); the *Age Discrimination Act of 1975* (89 Stat. 728; 42 U.S.C. §§6101 et seq.); and with all other federal laws and regulations prohibiting discrimination on grounds of race, color, sexual orientation, national origin, disabilities, religion, age, or sex.

2. **Lobbying Prohibition** –Lobbying with Appropriated Moneys – No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress, a jurisdiction, or an official of any government, to favor, adopt, or oppose, by vote or otherwise, any legislation, law, ratification, policy or appropriation, whether before or after the introduction of any bill, measure, or resolution proposing such legislation, law ratification, policy or appropriation; but this shall not prevent officers or employees of the United States or of its departments or agencies from communicating to Members of Congress or such official, through the proper official channels, requests for any legislation, law, ratification, policy or appropriations which they deem necessary for the efficient conduct of the public business, or from making any communication whose prohibition by this section might, in the opinion of the Attorney General, violate the Constitution or interfere with the conduct of foreign policy, counter-intelligence, intelligence or national security activities. Violations of this section shall constitute violations of 31 U.S.C. § 1352(a).

3. **Anti-Deficiency Act -** *31 U.S.C. §1341* - Nothing contained in this Agreement shall be construed as binding the NPS to expend in any one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purposes of this Agreement for that fiscal year, or other obligation for the further expenditure of money in excess of such appropriations or allocations.

ARTICLE XIII – SIGNATURES

IN WITNESS HEREOF, the parties hereto executed this Agreement on the date(s) set forth below.

For the National Park Service:

Superintendent
Assateague Island National Seashore
National Park Service

6/22/04
Date

For the Maryland Department of Natural Resources:

Wesley R. Johnson
Assistant Secretary

6/22/04
Date

Approved as to form and legal sufficiency this 22nd day of June, 2004.

Assistant Attorney General

INTERAGENCY AGREEMENT

BETWEEN

U.S. Fish and Wildlife Service (FWS) AND National Park Service (NPS)

Pertaining to the Administration, Development, and Use of the Toms Cove Hook Area Within the Chincoteague National Wildlife Refuge-Assateague Island National Seashore

Article I: Background and Objectives

A. The Chincoteague National Wildlife Refuge (NWR) on Assateague Island was established in 1943 for administration by the U.S. Fish and Wildlife Service (FWS) under authority of the Migratory Bird Conservation Act. In 1959, under authority of P.L. 85-57, the Secretary granted to the Chincoteague-Assateague Bridge and Beach Authority a roadway easement across the refuge to Toms Cove Hook. At that time the FWS also entered into an agreement with the Authority allowing the Authority to develop and manage beachfront recreational facilities. These actions were taken in recognition of the need for public recreational facilities and in recognition that regulated public use of the Toms Cove Beach could be permitted without encroachment upon the lands that were of primary importance to wildlife.

B. When Assateague Island National Seashore was created with passage of P.L. 89-195 in 1965, its boundaries were drawn to encompass the Chincoteague NWR. P.L. 89-195 authorized the Secretary to acquire all of the right, title or interests of the Authority, including its real and personal property. The acquisition was accomplished with NPS appropriations in 1966. NPS also acquired several other public and private tracts within the refuge boundaries.

C. Given the dual agency presence on Assateague Island, the Assistant Secretary assigned certain management responsibilities to the FWS and to the NPS. By formal cooperative agreement with FWS, NPS assumed all of the responsibilities formerly held by the Authority. This arrangement was found to be consistent with Section 6(b) of P.L. 89-195, which required that land and waters within the refuge "be administered for refuge purposes under laws and regulations applicable to national wildlife refuges, including administration for public recreation use in accordance with the provisions of the Act of September 28, 1962" (Public Law 87-714, the Refuge Recreation Act). This act reads in part, ". . . if such recreational opportunities are provided, to assure that any present or future recreational use will be compatible with, and will not prevent accomplishment of the primary purposes for which the

said co nservation areas were acquired or established, the Secretary of the Interior is authorized, as an appropriate incidental or secondary use, to administer such areas or parts thereof for public recreation when in his judgement public recreation can be an appropriate incidental or secondary use: Provided, that such public recreation use shall be permitted only to the extent that is practicable, and not inconsistent with other previous authorized Federal operations or with the primary objectives for which each particular area is established: . . . ."

Amendments to the National Wildlife Refuge System Administration Act in 1976 prompted a review of the cooperative arrangement at Toms Cove Hook. The amendments required that FWS have ultimate decision-making authority within units of the refuge system. Subsequent Solicitors, opinions, discussing the effects of Public Law 94-223, affirm the authority of the FWS to cooperate with other Federal agencies to carry out the Service's responsibilities on National Wildlife Refuges and that the NPS may administer programs for public recreation and use in the Toms Cove Hook area so long as these programs have the approval of the FWS. This arrangement was formalized by Memorandum of Understanding dated October 26, 1979.

E. The objectives of both the FWS and the NPS with respect to Toms Cove Hook are:

1. To protect and manage natural resource values;

2. To provide high quality recreational and interpretive services:

3. To efficiently manage all visitor services;

4. To eliminate unnecessary duplication of services;

5. To eliminate unnecessary review and paperwork;

6. To most effectively utilize the experience, skill and expertise of the two agencies' personnel; and

7. To achieve the long-range management objectives set forth in the current formal planning documents for Chincoteague NWR, as may now exist or as may be adopted in the future.

F. The purpose of this Interagency Agreement is to update and revise the 1979 Memorandum of Understanding, and thereby foster improved interagency cooperation on Assateague Island and help each agency better achieve the objectives enumerated in Article I.E. This agreement, unless otherwise

specified, applies to the area known as Toms Cove Hook, hereinafter to be referred to as the "assigned area." The assigned area is the area bounded on the north by the wildlife fence adjacent to the main parking lot, on the east and south by the Atlantic Ocean extending to Fishing Point, and on the west by the waters of Toms Cove to and along the canal in Swan Cove adjacent to the same main parking lot. A map depicting the "assigned area" is attached to, and is a part of, this agreement. This agreement does not apply to the remainder of the refuge, nor to the tidal waters or lands which lie outside the refuge boundaries but within the Seashore boundaries.

G. NOW, THEREFORE, in consideration of and compliance with the foregoing legislative and executive directives it is mutually agreed that, within the assigned area, the NPS will, subject to approval by the FWS, assume responsibility for the execution of items hereinafter described in this agreement in Article II.A., and the FWS will assume responsibility for the execution of items in Article II.B.; and the two Services jointly will assume the responsibility for the items contained in Article II.C.

Article II: Roles and Responsibilities

A. The NATIONAL PARK SERVICE will, within the assigned area:

1. Provide and manage visitor contact and interpretive facilities and programs for public recreation and interpretation. Appropriate recreational activities include those related to swimming, surfing and associated beach use; fishing; crabbing; clamming; boating; ORV use; and others which may be approved by FWS. Appropriate interpretative activities include those relating to the above-named recreational activities and also those relating to the ocean; to beach and dune ecology; to the salt marsh (including birdlife and other wildlife of the marsh); and to the human use and occupation of Toms Cove Hook and barrier islands in general. All such facilities and programs shall be designed and executed in accordance with NPS policies, procedures and standards. Any expansion or modification of existing programs or facilities, or development of new ones, will be submitted to the FWS for approval prior to implementation.

2. Be responsible for all routine maintenance activities, including pickup and disposal of trash; mowing of grass areas; maintenance and repair of buildings, boardwalks, fences and other structures; cleaning and repair of

sanitary facilities; maintenance and repair of utility systems; installation, repair and replacement of exhibits and signs; roadway shoulder and parking lot maintenance, including grading, patching of potholes, striping and resurfacing of existing paved surfaces, removal of sand from paved surfaces, and make appropriate and reasonable efforts to maintain and repair sand dunes in the context of trying to find sustainable long range solutions to the delivery of recreation services on a dynamic barrier island. All such routine maintenance shall be consistent with NPS policies, procedures and standards, which have been reviewed by the FWS and found to be appropriate and applicable for the assigned area. After consultation with the Refuge Manager, new construction, or the rebuilding or replacement of structures or paved surfaces seriously damaged by storm events, will be accomplished in a sustainable manner and in accordance with the Refuge's Master Plan.

3. Provide for the protection and safety of the visiting public including, but not limited to, law enforcement, motorist assistance, fire prevention/suppression, first aid, and protected beaches. Law enforcement actions shall be performed in accordance with a separate interagency agreement designed specifically for that

4. Operate an Eastern National Park and Monument Association sales outlet, and offer for sale those educational or interpretive items which are complimentary to the objectives of the Seashore and the Refuge or reinforce the goals of the two Services. The policies, procedures and sales practices of Eastern National Park and Monument Association have been reviewed by the FWS and found to be appropriate and applicable for the assigned area. The Regional Director of the FWS or his designated agent must approve all items offered for sale which discuss the Chincoteague NWR or the policies or management of the FWS.

5. When appropriate or requested, provide the Refuge Manager with brief reports on noteworthy activities and accomplishments within the assigned area. Such report could include statistical data as may be necessary to meet FWS reporting requirements.

6. Assist the FWS in phasing in the facility and programmatic changes set forth in current and future refuge planning documents.

B. The FISH AND WILDLIFE SERVICE will:

1. Based on NPS's recommendations, identify those Title 36 CFR regulations that are appropriate for use on the assigned area, and which will subsequently be published by FWS in 50 CFR as special regulations applicable to the assigned area.

2. Retain primary responsibility for managing the wildlife resources within the assigned area, with the understanding by both agencies that recreational use programs will be planned and carried out to minimize impacts on wildlife resources.

3. Refrain from conducting within the assigned area personal service programs which duplicate those that are provided by NPS.

4. Utilize available authorities to establish and administer an appropriate system for collection and intra-agency reimbursement of recreational user fees.

5. Designate, at sites on Assateague Island and on the mainland, away from the corrosive forces of the ocean front, vehicle and/or equipment storage and maintenance space of sufficient size to meet the needs of the NPS.

6. Be responsible for all research, photographic and special use permits issued for activities within the assigned area, and inform the NPS of the conditions of these permits and other Refuge permits impacting operations within the assigned area.

7. Identify facility improvements and construction activities which would not be compatible with, or which would prevent accomplishment of, the primary purposes for which the refuge was established. FWS will provide NPS with specific reasons as to why an activity might be incompatible with suggestions as to how the activity might be modified to insure compatibility.

The NATIONAL PARK SERVICE and FISH AND WILDLIFE SERVICE will jointly:

1. Notify as soon as possible the other agency about incidents, problems, or violations of regulations observed or reported which affect the other agency. Neither agency will assume the responsibility to act on behalf of the other agency unless specifically requested to do so. This provision shall not preclude immediate response to emergencies by qualified personnel from either Service. Each agency will provide to the other, upon request, copies of incident reports, or summary data concerning incidents.

2. Notify in advance the other agency of management practices or operations which may generate visitor, inquiry. Examples include controlled burns, area closures, revised hours of operation, etc.

3. Consult with one another at the earliest practicable opportunity to resolve conflicts concerning management activities. In the case of conflicts which are, or which may become, the subject of public attention or dispute, the Refuge Manager and the Seashore Superintendent will agree upon a common position for public information purposes. Differences of opinion will be resolved outside the public arena, and maximum efforts will be made to avoid the appearance of disharmony among the two agencies.

4. Provide upon request the necessary personnel to assist in managing emergency situations, including medical, fire and law-enforcement related emergencies, and other situations which may jeopardize life and/or property. Standard operating procedures for responding to emergencies shall be developed by the Seashore Superintendent and Refuge Manager. A related goal shall be development of a dependable radio communications system between the two agencies.

2. Notify in advance the other agency of management practices or operations which may generate visitor, inquiry. Examples include controlled burns, area closures, revised hours of operation, etc.

3. Consult with one another at the earliest practicable opportunity to resolve conflicts concerning management activities. In the case of conflicts which are, or which may become, the subject of public attention or dispute, the Refuge Manager and the Seashore Superintendent will agree upon a common position for public information purposes. Differences of opinion will be resolved outside the public arena, and maximum efforts will be made to avoid the appearance of disharmony among the two agencies.

4. Provide upon request the necessary personnel to assist in managing emergency situations, including medical, fire and law-enforcement related emergencies, and other situations which may jeopardize life and/or property. Standard operating procedures for responding to emergencies shall be developed by the Seashore Superintendent and Refuge Manager. A related goal shall be development of a dependable radio communications system between the two agencies.

5. Transfer appropriated funds to offset, in whole or in part, agreed upon costs incurred for personnel, supplies or equipment utilized in direct support of mutually beneficial construction or operational programs, including off-road vehicle fees as agreed to in the memorandum dated January 18, 1996.

6. Congressional authorization requires both agencies to honor Golden Eagle, Golden Age, and Golden Access permits for regular entrance fees. The mutual goal of both agencies shall be consistency of the off-road recreational use fees at Assateague Island.

7. Except as may be approved by the Seashore Superintendent and Refuge Manager, refrain from indicating agency name on signs, except for the directional signs on U.S. Route 13, the entrance sign at the bridge and at the entrance to the assigned area, where both agencies will be given full recognition.

8. Share operational facilities and equipment to the extent practical. Either agency may initiate a request for the temporary use of an item of equipment or a facility subject to recall to meet the responsibilities of the controlling agency.

9. Coordinate the collection of public use statistics, release of publications, and news releases that pertain to the assigned area.

10. Develop working procedures to implement this Agreement, such procedures to be decided cooperatively by the Seashore Superintendent and Refuge Manager. And, as necessary for the understanding and guidance of their respective staffs, procedures will be issued as a written, signed directive supplementing this Agreement. Minor problems that arise in the field will be resolved through the normal chain of command procedures. The Superintendent and Manager shall meet as necessary to review working procedures and questions regarding compliance. Should the Superintendent and Manager fail to reach agreement on working procedures or questions of compliance required to implement this Agreement, the area of disagreement will be referred to the Northeast Regional Director of FWS and the Northeast Field Director of NPS for resolution.

11. Schedule an annual meeting, at a mutually acceptable time and place, of the Seashore Superintendent and Refuge Manager, along with appropriate staff, for a formal review of operations under this Agreement, including but not limited to compliance with conditions of this Agreement and working procedures, problem

areas, coordination of programs and plans for the next year, proposed amendments to the Agreement, etc. Any areas of disagreement that cannot be resolved between the Superintendent and Refuge Manager shall be referred as above for resolution.

12. Coordinate and cooperate in natural resources management and research activities which may have an impact on the resources managed by the other agency. Both agencies recognize that each has distinct policies and approaches to resources management but that management of the island resources as a complete unit is environmentally sound. Where appropriate, research and resource information will be shared, activities will be planned jointly, and technology transfer will occur. This condition applies to the entire refuge and park and not solely to the assigned area.

Article III: Key Officials

The key officials who are party to this Agreement are the Refuge Manager, Chincoteague National Wildlife Refuge on behalf of the U.S. Fish and Wildlife Service, and Superintendent, Assateague Island National Seashore, on behalf of the National Park Service, who shall be responsible for executing and implementing this Agreement.

Article IV: Term and Cancellation of Agreement

This Agreement shall be effective from the date of this instrument and shall remain in effect for a period of five (5) years. This Agreement will be reviewed prior to its expiration to determine whether it should be renewed, modified or terminated; it may be modified at any time with the mutual agreement of the parties hereto. This Agreement may be cancelled by mutual agreement of the parties, or in the event the terms and conditions hereof are not fulfilled. In the latter event, cancellation may be effected by either party hereto upon thirty (30) days written notice to the other.

FOR THE FISH AND WILDLIFE SERVICE

John D Schroer

John D. Schroer
Refuge Manager
Chincoteague National
Wildlife Refuge

Date: JULY 25, 1996

FOR THE NATIONAL PARK SERVICE

Marc A. Koenings

Marc A. Koenings
Superintendent
Assateague Island
National Seashore

Date: July 22, 1996

Susan D. Kurtz

SUSAN D. KURTZ
CONTRACTING OFFICER, NPS

AUG 23 1996

Final 05/11/00

AGREEMENT
Between
The
UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
and the
DNR - FOREST SERVICE, STATE OF MARYLAND

This Agreement is made this 11 day of May, 2000, by and between DEPARTMENT OF NATURAL RESOUCES - FOREST SERVICE, STATE OF MARYLAND (hereinafter called the "Department") AND the United States of America, U.S. Department of the Interior, National Park Service, NATIONAL CAPITAL REGION, NORTH EAST REGION, AND APPALACHIAN NATIONAL SCENIC TRAIL (hereinafter called the "Service").

Article I.Background and Objectives

WHEREAS: The Service administers various park units throughout the State of Maryland.

WHEREAS: The Department is responsible for suppression of wildland fire on privately and non-Federal publicly owned lands in Maryland; and

WHEREAS: The Service has authority to suppress wildland fires on Federally owned Appalachian National Scenic Trail and park lands administered by the National Capital and Northeast Regions; and

WHEREAS: The parties hereto are desirous of cooperating for the purpose of controlling wildland fire on neighboring and intermingled Department protected and Service lands adjoining and within the National Park Service boundaries; and

WHEREAS: It is to the mutual advantage of the Department and the Service to cooperate closely in the prevention and control of wildland fire.

Article II. Authority
NOW THEREFORE, pursuant to the authority of Maryland Code Ann., Nat. Res. §§ 5-701 – 5-706, 16 U.S.C. §§1b(1), 1246(h), and 42 U.S.C. §§1856a, a-1, d, the parties agree to the following:

Article III.Statement of Work

A. The Service Agrees To:

(1) Meet with representatives of the Department annually to update a joint training schedule; discuss and plan fire responses; update lists of personnel, equipment and services that could be made available; and discuss other topics covered by this Agreement.

(2) Provide the Department with the opportunity to attend any fire management training which it sponsors.

(3) Provide the Department with a directory of its responsible fire management personnel, control capabilities, and fire equipment available for dispatch, updated annually.

(4) The Service may make initial attack and suppress unstaffed wildland fires on, or threatening Department owned or protected lands, and remain until relieved by the first responding State crew. In the event that the Service is unable to take action, the Department will be immediately notified of the fire location. Dozers, plows, or other heavy mechanized equipment are not authorized on non-Federally owned lands without prior approval of the Department.

(5) May request crews, overhead, and support services, including office of Aircraft Services (OAS) certified helicopters, tankers and pilots, from the Department as needed to control fires, provided the resources are available and can be dispatched without jeopardizing the responding party's preparedness.

(6) Request and document resource orders on standard ICS resource order forms. Requests will include resource order numbers; the number and type of resources requested; where, when, and to whom the resources are to report; and a contact telephone number.

(7) Initial responding resources will be under the direction of an Initial Attack Incident Commander who will direct suppression efforts, until relieved by the designated Incident Commander within whose jurisdiction the fire is burning.

(8) Utilize a Unified Command when a wildland fire is burning on both Department and Service lands, unless otherwise agreed to at the scene or delineated in a delegation of authority.

(9) Keep the Department's crew(s) intact and with their own leadership, if possible, and to release the Department's personnel as soon as it is feasible and prudent for the Incident Commander to do so, or upon the request of the Department's headquarters.

(10) After the first 24 hours, to dispatch only personnel who meet or exceed the minimum requirements for qualifications, personnel protective equipment, and meet the physical fitness standards of the requesting agency.

(11) The Service agrees that this Agreement shall be subject to the express condition that the exercise thereof will not unduly interfere with the management and administration by the Department of the lands affected.

(12) Aggressively investigate the cause of wildland fires being jointly suppressed and will exchange law enforcement information developed.

(13) Conduct a joint review of fires that are managed under this agreement.

(14) Notify the Department of any prescribed fire activities.

B. Department Agrees To:

(1) Meet with representatives of the Service annually to update a joint training schedule; discuss and plan fire responses; update lists of personnel, equipment and services that could be made available; and discuss other topics covered by this Agreement.

(2) Provide the Service with the opportunity to attend any fire management training which it sponsors.

(3) Provide the Service with a directory of its responsible fire management personnel, control capabilities, and fire equipment available for dispatch, updated annually.

(4) May make initial attack and suppress unstaffed wildland fires on, or threatening Service owned lands, and

remain until relieved by the first responding Service crew. Dozers, plows, or other heavy mechanized equipment are not authorized at any time on lands owned by the Service without prior approval from the Service.

(5) May request crews, overhead, and support services, including office of Aircraft Services (OAS) certified helicopters, tankers and pilots, from the Service as needed to control fires, provided the resources are available and can be dispatched without jeopardizing the Service's preparedness.

(6) Request and document resource orders on standard ICS resource order forms. Requests will include resource order numbers; the number and type of resources requested; where, when, and to whom the resources are to report; and a contact telephone number.

(7) Initial responding resources will be under the direction of an Initial Attack Incident Commander who will direct suppression efforts, until relieved by the designated Incident Commander within whose jurisdiction the fire is burning.

(8) Utilize a Unified Command when a wildland fire is burning on both Department and Service lands, unless otherwise agreed to at the scene or delineated in a delegation of authority.

(9) Keep the Service's crew(s) intact and with their own leadership, if possible, and to release the Service's personnel as soon as it is feasible and prudent for the Incident Commander to do so, or upon the request of the Service's headquarters.

(10) After the first 24 hours, to dispatch only personnel who meet or exceed the minimum requirements for qualifications, personal protective equipment, and meet physical fitness standards of the requesting agency.

(11) The Department agrees that this Agreement shall be subject to the express condition that the exercise thereof will not unduly interfere with the management and administration by the Service of the lands affected.

(12) Aggressively investigate the cause of wildland fires being jointly suppressed and will exchange law enforcement information developed.

(13) Conduct a joint review of fires that are managed under this agreement.

(14) Notify the Service of any prescribed fire activities.

Article IV.Term of Agreement

Any modification to the provisions of the Agreement shall be made in writing and shall become effective only upon the written approval of all parties.

Unless earlier terminated by operation of the terms of this agreement or by agreement of the parties in writing, this Agreement shall expire on in five years after signature of the last party. Prior to the conclusion of the term, the parties will determine whether the agreement should be reaffirmed, re-written, or be permitted to expire

Final 05/11/00

Article V. Key Officials

National Park Service
Terry Carlstrom
Regional Director
National Capital Region
1100 Ohio Drive, SW.
Washington, D.C. 20242

Marie Rust
Regional Director
Northeast Region
200 Chestnut Street
Philadelphia, PA 19106

Pam Underwood
Project Manager
Appalachian National Scenic Trail
c/o Harpers Ferry Center
Harpers Ferry, West Virginia 25425

Department of Natural Resources- Forest Service, State of Maryland
James Mallow
State Forester
State of Maryland
Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401

Robert Hartlove
Acting State Fire Supervisor
Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401

Article VI. Liability

The Parties accept responsibility for any property damage, injury, or death caused by the acts or omissions of their respective employees, acting within the scope of their employment, to the fullest extent permitted by law. To the extent work is to be provided by a non-governmental entities or persons, DNR - FOREST SERVICE, STATE OF MARYLAND will require that entity or person to:

(a) procure public and employee liability insurance from a responsible company or companies with a minimum limitation of One Million Dollars ($1,000,000) per person for any one claim, and an aggregate limitation of Three Million Dollars ($3,000,000) for any number of claims arising from any one incident. The policies shall name the United States as an additional insured, shall specify that the insured shall have no right of subrogation against the United States for payments of any premiums or deductibles due thereunder, and shall specify that the insurance shall be assumed by, be for the account of, and be at the insured's sole risk. Prior to beginning the work authorized herein, the contractor shall provide the Service with confirmation of such insurance coverage; and

(b) Pay the United States the full value for all damages to the lands or other property of the United States caused by such person or organization, its representatives, or employees; and

(c) Indemnify, save and hold harmless, and defend the United States against all fines, claims, damages, losses, judgments, and expenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

Article VII. Termination

If either party fails to observe any of the terms and conditions of this Agreement, the other party may terminate this Agreement for default without any legal process whatsoever by giving thirty (30) days written notice of termination, effective at the end of the thirty (30) day period.

The National Park Service may terminate this Agreement for the convenience of the government, at any time, when it is determined to be in the best interest of the public to do so. The effected parties shall be notified in writing within 5 working days following the termination.

Article VIII. Required Clauses

A. NON-DISCRIMINATION: The Parties shall abide by the provisions of Executive Order 11246, as amended, shall be in compliance with the requirements of Title VI of the Civil Rights Act of 1964, as amended (78 Stat. 252; 42 U.S.C 2000d (1994 & Supp. I 1995)); Title V, Section 504 of the Rehabilitation Act of 1973 (87 Stat. 394, 29 U.S.C. ' 794 (1994)), the Age Discrimination Act of 1975 as amended 89 Stat. 728; 42 U.S.C. 6101 (1994) and with all other Federal laws and regulations prohibiting discrimination on grounds of race, color, national origin, disability, religion, or sex, in employment and in providing of facilities and services to the public.

B. ANTI-DEFICIENCY ACT: Pursuant to the Anti-Deficiency Act, 31 U.S.C. 1341(a)(1)(1994), nothing herein contained shall be construed as binding the United States to expend in any one fiscal year any sum in excess of appropriations made by Congress for this purpose, or to involve the United States in any contract or other obligation for the further expenditure of money in excess of such appropriations.

C. INTEREST OF MEMBERS OF CONGRESS: Pursuant to 41 U.S.C. 22, Interest of Member of Congress, (1994), "No Member of Congress shall be admitted to any share or part of any contract or agreement made, entered into, or accepted by or on behalf of the United States, or to any benefit to arise thereupon."

D. LOBBYING PROHIBITION: The Parties shall abide by the provisions of 18 U.S.C. 1913 Lobbying with Appropriated Moneys, (1994), which states:

No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers or employees of the United States or of its departments or agencies from communicating to Members of Congress on the request of any Member of Congress, through the proper official channels, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business.

Whoever, being an officer or employee of the United States or of any department or agency thereof, violates or attempts to violate this section, shall be fined under this title or imprisoned not more than one year, or both; and after notice and hearing by the superior officer vested with the power of removing him, shall be removed from office or employment.

E. SEVERANCE OF TERMS AND COMPLIANCE WITH APPLICABLE LAW: The Parties shall comply with all applicable laws and regulations. This Agreement is subject to all laws, regulations and rules governing National Park Service property, whether now in force or hereafter enacted or promulgated. Nothing in the Agreement shall be construed as in any way impairing the general powers of the National Park Service for supervision, regulation, and control of its property under such applicable laws, regulations, and rules.

If any term or provision of this Agreement is held to be invalid or illegal, such term or provision shall not affect the validity or enforceability of the remaining terms and provisions. Meeting the terms of this Agreement shall not excuse any failure to comply with all applicable laws and regulations, whether or not these laws and regulations are specifically listed herein.

Article IX. Standard Clauses

A. PAYMENT/COST:

Each party will assume responsibility for its respective initial attack costs for the first 24 hour period.

Reimbursement may be made by the receiving agency for personnel and/or equipment, including contract equipment, ordered or used beyond the first 24 hour period.

Subsistence, travel, equipment operation, salaries, wages, as well as overtime and related employee benefit costs are recognized as reimbursable suppression costs.

Only direct costs of the party, associated with the suppression of the wildland fire, will be chargeable. Direct costs shall be itemized by category (e.g.: Personnel, supplies, equipment rental, etc.) and submitted to the responsible agency for reimbursement with 45 days of the close of the incident. Personnel costs shall be further broken down by employee classification; hourly wage, including benefits; and associated premium pay. See Appendix C.

B. REPORTS:

Each party will promptly report to the other all wildland fires detected on Service, State and/or privately owned lands within or adjacent to Service-owned lands in Maryland, in accordance with the procedures outlined in Appendix A.

The Department will forward within 45 days of the fire being declared out all fire reports and fire-related correspondence regarding wildland fires on or within Service boundaries of Antietam NB, C&O Canal NHP, Catoctin Mountain Park, Monacacy NB, Greenbelt Park and portions of National Capital Parks East to:

Regional Director, National Capital Region
National Park Service
1100 Ohio Drive, SW.
Washington, D.C. 20242

Attention: Regional Fire Management Officer

(Page 7 Missing)

Article X. Authorizing Signatures

Agreed between the parties this _____ day of _____.

National Park Service
National Capital Region
for Regional Director

STATE OF MARYLAND
DNR FOREST SERVICE,
State Forester

National Park Service
Northeast Region
Regional Director

STATE OF MARYLAND
DNR FOREST SERVICE,
State Fire Supervisor

National Park Service
Appalachian National Scenic Trail
Project Manager

Appendix A

Maryland Department of Natural Resources – Forest Service

For fire and activities that affect the lands under the protection of the Maryland Department of Natural Resources, Forest Service, the following number(s) will be called for fire reporting and/ or assistance.

Long Hill Communications Center

24 Hour Dispatch Center for State of MD

(410) 260-8888

FAX (410) 260-8939

Appendix A

National Park Service

In those instances where there is a wildland fire within, threatening or encroaching upon a unit of the National Park Service, that specific unit is to be notified directly at the number listed in this appendix. If, for any reason, that unit cannot be contacted, the reporting party will notify the Eastern Interagency Coordination Center (EICC) located at Shenandoah National Park at the numbers listed. National Park areas indicated with an * will have the National Capital Region Dispatch Center at C & O Canal as their contact point in the event that a unit specific contact cannot be made.

***Appalachian National Scenic Trail**
C/O Harpers Ferry Center
Appalachian Trail Project Office
Harpers Ferry, West Virginia 25425

Eastern Interagency Coordination Center 540 999-2227
1 800 732-0911
FAX (540) 999-2204

Assateague Island National Seashore
7206 National Seashore Lane
Berlin, MD 21811

Allen Ethridge (410) 641-3937
PAGER (410) 334-7168

Will Reynolds (410) 641-3937
PAGER (410) 334-7054
FAX (410) 641-3581

Thomas Stone National Historic Site
C/O George Washington Birthplace National Monument
George Washington's Birthplace, VA 22575

Dana Condren	(804) 224-1732 FAX (804) 224-2142

Fort McHenry National Monument and Historic Shrine
End of East Fort Avenue
Baltimore, MD 21230-5393

Fire Coordinator	Rick Apfel	(410) 962-4290 x 238

Shenandoah National Park
3655 U.S. Highway 211 E
Luray, VA 22835

Eastern Interagency Coordination Center	(540) 999-2227 1 800 732-0911 FAX (540) 999-2204
Douglas Raeburn	(540) 999-3441 PAGE (540) 999-2227 FAX (540) 999-3644

Reports:

The Department will forward within 45 days of a fire being declared out, a copy of all fire reports and other fire-related correspondence regarding wildland fires on or within Service boundaries of Thomas Stone National Historic Site, Assateague Island National Seashore, and Fort McHenry National Monument and Historic Shrine to:

Fire Management Officer
Shenandoah National Park
3655 US Highway 211 E
Luray, VA 22835

The Service will forward within 45 days of a fire being declared out, a copy of Form 1202 "Individual Fire Report" and other fire-related correspondence regarding wildland fires on or within State and/or privately owned lands upon which the Service took suppression action:

State Fire Supervisor
State of Maryland
Department of Natural Resources – Forest Service
Tawes State Office Building
580 Taylor Avenue
Annapolis, Maryland 21401

AGREEMENT

BETWEEN

**THE UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE**

AND

**THE COMMONWEALTH OF VIRGINIA
DEPARTMENT OF FORESTRY**

Agreement is made this _____ day of _____, 2001, by and between the Commonwealth of Virginia, Department of Forestry (hereinafter called the Department) acting by and through the State Forester, and the United States Department of the Interior, National Park Service (hereinafter called the Service), acting by and through the Regional Directors, Northeast Region, Southeast Region, National Capital Region, and the project Manager, Appalachian National Scenic Trail.

Article I.Background and Objectives

WHEREAS: The purpose of this agreement is to facilitate the cooperation of the parties involved in the conduct of wildland fire management activities, including detection, prevention, suppression, and prescribed fire in order to protect the lands under the jurisdiction of each. The Service lands covered by this Agreement include all of those lands administered by the Department of Interior, National Park Service, Northeast Region, Southeast Region, and the Appalachian National Scenic Trail within the Commonwealth of Virginia.

WHEREAS: The Department is responsible for wildland fire management activities on privately and non-Federal publicly owned lands in Virginia; and

WHEREAS: The Service is responsible for wildland fire management activities on lands within the boundaries of areas administered by the Service; and

WHEREAS: The parties hereto are desirous of cooperating for the purpose of managing wildland fire activities on both Department and Service lands; and

WHEREAS: It is to the mutual advantage of the Department and the Service to cooperate and coordinate closely in the full range of wildland fire management activities.

Article II. Authority

NOW THEREFORE, pursuant to the authority of Virginia Code Ann. §10.1 – 1126 (1989), 16 U.S.C. §§1b(1), 1246(h), and 42 U.S.C. §§1856a, a-1, d, the parties do mutually understand and agree as follows:

Article III. Statement of Work

The Agreement herein made is subject to the following terms and conditions:

A. The Service Agrees To:

(1) Meet with representatives of the Department annually to update a joint training schedule; discuss and plan fire responses; update lists of personnel, equipment and services that could be made available; and discuss other topics covered by this Agreement.

(2) Provide the Department with the opportunity to attend any fire management training which it sponsors.

(3) Provide the Department with a directory of its responsible fire management personnel, control capabilities, and fire equipment available for dispatch, updated annually.

(4) The Service may make initial attack and suppress unstaffed wildland fires on, or threatening Department owned or protected lands, and remain until relieved by the first responding State crew. In the event that the Service is unable to take action, the Department will be immediately notified of the fire location. Dozers, plows, or other heavy mechanized equipment are not authorized on non-Federally owned lands without prior approval of the Department.

(5) May request crews, overhead, and support services, including office of Aircraft Services (OAS) certified helicopters, tankers and pilots, from the Department as needed to control fires, provided the resources are available and can be dispatched without jeopardizing the responding party's preparedness.

(6) Request and document resource orders on standard ICS resource order forms. Requests will include resource order numbers; the number and type of resources requested; where, when, and to whom the resources are to report; and a contact telephone number.

(7) Initial responding resources will be under the direction of an Initial Attack Incident Commander who will direct suppression efforts, until relieved by the designated Incident Commander within whose jurisdiction the fire is burning.

(8) Utilize a Unified Command when a wildland fire is burning on both Department and Service lands, unless otherwise agreed to at the scene or delineated in a delegation of authority.

(9) Keep the Department's crew(s) intact and with their own leadership, if possible, and to release the Department's personnel as soon as it is feasible and prudent for the Incident Commander to do so, or upon the request of the Department's headquarters.

(10) After the first 24 hours, to dispatch only personnel who meet or exceed the minimum requirements for qualifications, personnel protective equipment, and meet the physical fitness standards of the requesting agency.

(11) The Service agrees that this Agreement shall be subject to the express condition that the exercise

thereof will not unduly interfere with the management and administration by the Department of the lands affected.

(12) Aggressively investigate the cause of wildland fires being jointly suppressed and exchange law enforcement information developed.

(13) Conduct a joint review of fires that are managed under this agreement.

(14) Notify the Department of any prescribed fire activities.

B. Department Agrees To:

(1) Meet with representatives of the Service annually to update a joint training schedule; discuss and plan fire responses; update lists of personnel, equipment and services that could be made available; and discuss other topics covered by this Agreement.

(2) Provide the Service with the opportunity to attend any fire management training which it sponsors.

(3) Provide the Service with a directory of its responsible fire management personnel, control capabilities, and fire equipment available for dispatch, updated annually.

(4) May make initial attack and suppress un-staffed wildland fires on, or threatening Service owned lands, and remain until relieved by the first responding Service crew. Dozers, plows, or other heavy mechanized equipment are not authorized at any time on lands owned by the Service without prior approval from the Service.

(5) May request crews, overhead, and support services, including office of Aircraft Services (OAS) certified helicopters, tankers and pilots, from the Service as needed to control fires, provided the resources are available and can be dispatched without jeopardizing the Service's preparedness.

(6) Request and document resource orders on standard ICS resource order forms. Requests will include resource order numbers; the number and type of resources requested; where, when, and to who the resources are to report; and a contact telephone number.

(7) Initial responding resources will be under the direction of an Initial Attack Incident Commander who will direct suppression efforts, until relieved by the designated Incident Commander within whose jurisdiction the fire is burning.

(8) Utilize a Unified Command when a wildland fire is burning on both Department and Service lands, unless otherwise agreed to at the scene or delineated in a delegation of authority.

(9) Keep the Service's crew(s) intact and with their own leadership, if possible, and to release the Service's personnel as soon as it is feasible and prudent for the Incident Commander to do so, or upon the request of the Service's headquarters.

(10) After the first 24 hours, to dispatch only personnel who meet or exceed the minimum requirements for

qualifications, personal protective equipment, and meet physical fitness standards of the requesting agency.

(11) The Department agrees that this Agreement shall be subject to the express condition that the exercise thereof will not unduly interfere with the management and administration by the Service of the lands affected.

(12) Aggressively investigate the cause of wildland fires being jointly suppressed and exchange law enforcement information developed.

(13) Conduct a joint review of fires that are managed under this agreement.

(14) Notify the Service of any prescribed fire activities.

Article IV.Term of Agreement

Any modification to the provisions of the Agreement shall be made in writing and shall become effective only upon the written approval of all parties.

Unless earlier terminated by operation of the terms of this agreement or by agreement of the parties in writing, this Agreement shall expire in five years after signature of last party. Prior to the conclusion of the term, the parties will determine whether the agreement should be reaffirmed, re-written, or be permitted to expire

Article V. Key Officials

National Park Service

Terry Carlstrom
Regional Director
National Capital Region
1100 Ohio Drive, SW.
Washington, D.C. 20242

Marie Rust
Regional Director
Northeast Region
200 Chestnut Street
Philadelphia, PA 19106

Jerry Belson

Commonwealth of Virginia Department of Forestry

James W Garner
State Forester
900 Natural Resources Drive
Suite 800
Charlottesville, VA 22903

Lou Southerd
State Fire Chief
900 Natural Resources Drive
Suite 800
Charlottesville, VA 22903

Regional Director
Southeast Region
Atlanta Federal Center
1924 Building
100 Alabama St.
Atlanta, GA 30303

Pam Underwood
Project Manager
Appalachian National Scenic Trail
c/o Harpers Ferry Center
Harpers Ferry, West Virginia 25425

Article VI. Liability

The Parties accept responsibility for any property damage, injury, or death caused by the acts or omissions of their respective employees, acting within the scope of their employment, to the fullest extent permitted by law. To the extent work is to be provided by a non-governmental entity or persons, the Department will require that entity or person to:

(a) procure public and employee liability insurance from a responsible company or companies with a minimum limitation of One Million Dollars ($1,000,000) per person for any one claim, and an aggregate limitation of Three Million Dollars ($3,000,000) for any number of claims arising from any one incident. The policies shall name the United States as an additional insured, shall specify that the insured shall have no right of subrogation against the United States for payments of any premiums or deductibles due hereunder, and shall specify that the insurance shall be assumed by, be for the account of, and be at the insured's sole risk. Prior to beginning the work authorized herein, the contractor shall provide the Service with confirmation of such insurance coverage; and

(b) Pay the United States the full value for all damages to the lands or other property of the United States caused by such person or organization, its representatives, or employees; and

(c) indemnify, save and hold harmless, and defend the United States against all fines, claims, damages, losses, judgments, and expenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

Article VII. <u>Termination</u>

If either party fails to observe any of the terms and conditions of this Agreement, the other party may terminate this Agreement for default without any legal process whatsoever by giving thirty (30) days written notice of termination, effective at the end of the thirty (30) day period.

The Service may terminate this Agreement for the convenience of the government, at any time, when it is determined to be in the best interest of the public to do so. The effected parties shall be notified in writing within 5 working days following the termination.

The Department may terminate this Agreement for the convenience of the Commonwealth, at any time, when it is determined to be in the best interest of the public to do so. The effected parties shall be notified in writing within 5 working days following the termination.

Article VIII. Required Clauses

A. NON-DISCRIMINATION: The Parties shall abide by the provisions of Executive Order 11246, as amended, shall be in compliance with the requirements of Title VI of the Civil Rights Act of 1964, as amended (78 Stat. 252; 42 U.S.C §§2000d(1994 & Supp. I 1995)); Title V, Section 504 of the Rehabilitation Act of 1973 (87 Stat. 394, 29 U.S.C. §794 (1994), as amended), the Age Discrimination Act of 1975 as amended 89 Stat. 728; 42 U.S.C. ' 6101 (1994) and with all other Federal laws and regulations prohibiting discrimination on grounds of race, color, national origin, disability, religion, or sex, in employment and in providing of facilities and services to the public.

B. ANTI-DEFICIENCY ACT: Pursuant to the Anti-Deficiency Act, 31 U.S.C. §1341(a)(1)(1994), nothing herein contained shall be construed as binding the United States to expend in any one fiscal year any sum in excess of appropriations made by Congress for this purpose, or to involve the United States in any contract or other obligation for the further expenditure of money in excess of such appropriations.

C. INTEREST OF MEMBERS OF CONGRESS: Pursuant to 41 U.S.C. §22, Interest of Member of Congress, (1994), "No Member of Congress shall be admitted to any share or part of any contract or agreement made, entered into, or accepted by or on behalf of the United States, or to any benefit to arise thereupon."

D. LOBBYING PROHIBITION: The Parties shall abide by the provisions of 18 U.S.C. §1913 Lobbying with Appropriated Moneys, (1994), which states:

> No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, any legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers or employees of the United States or of its departments or agencies from communicating to Members of Congress on the request of any Member of Congress, through the proper official channels, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business.
>
> Whoever, being an officer or employee of the United States or of any department or agency thereof, violates or attempts to violate this section, shall be fined under this title or imprisoned not more than one year, or both; and after notice and hearing by the superior

officer vested with the power of removing him, shall be removed from office or employment.

E. SEVERANCE OF TERMS AND COMPLIANCE WITH APPLICABLE LAW: The Parties shall comply with all applicable laws and regulations. This Agreement is subject to all laws, regulations and rules governing National Park Service property, whether now in force or hereafter enacted or promulgated. Nothing in the Agreement shall be construed as in any way impairing the general powers of the National Park Service for supervision, regulation, and control of its property under such applicable laws, regulations, and rules.

If any term or provision of this Agreement is held to be invalid or illegal, such term or provision shall not affect the validity or enforceability of the remaining terms and provisions. Meeting the terms of this Agreement shall not excuse any failure to comply with all applicable laws and regulations, whether or not these laws and regulations are specifically listed herein.

F. DRUG FREE WORK PLACE ACT: The parties certify that comprehensive actions will be taken to ensure the work place is drug free.

Article IX. Standard Clauses

A. PAYMENT/COST:

(1) Each party will assume responsibility for its respective initial attack costs for the first 24 hour period.

(2) Reimbursement may be made by the receiving agency for personnel and/or equipment, including contract equipment, ordered or used beyond the first 24 hour period.

(3) In those cases where wildland fires are burning after the first 24 hours on both Service and Department owned and/or protected lands, the Incident Commander will adhere to the suppression and mop-up standards of the receiving agency, insofar as facilities and manpower are available. The use of suppression methods and resources, not commonly used by the agency receiving the resource(s), will have the approval of the Agency Advisor or Officer-in-Charge before being ordered or deployed.

(4) Subsistence, travel, equipment operation, salaries, wages, as well as overtime and related employee benefit costs are recognized as reimbursable suppression costs.

(5) Only direct costs of the party, associated with the suppression of the wildland fire, will be chargeable. Direct costs shall be itemized by category (e.g.: Personnel, supplies, equipment rental, etc.) and submitted to the responsible agency for reimbursement with 45 days of the close of the incident. Personnel costs shall be further broken down by employee classification; hourly wage, including benefits; and associated premium pay.

(6) Nothing contained in this Agreement shall be construed as binding the Service to expend in any one fiscal year any sum in excess of appropriations made by Congress for the purposes of this Agreement for that fiscal year, or as involving the Service in any contract or other appropriation for the further

expenditure of money in excess of such appropriations.

(7) Nothing contained in this Agreement shall be construed as binding the Department to expend in any one fiscal year any sum in excess of appropriations made by the Commonwealth for the purposes of this Agreement for that fiscal year, or as involving the Department in any contract or other appropriation for the further expenditure of money in excess of such appropriations.

B. REPORTS:

(1) Each party will promptly report to the other all wildland fires detected on Service, State and/or privately owned lands within or adjacent to Service-owned lands in Virginia, in accordance with the procedures outlined in Appendix A.
(2) The Department will forward within 45 days of the fire being declared out all fire reports and fire-related correspondence regarding wildland fires on or within Service boundaries to the appropriate official as designated in Appendix A
(3) The Service will forward within 45 days of the fire being declared out a copy of a Form DI-1202 "Individual Fire Report" and other fire-related correspondence regarding wildland fires on or within State and/or privately owned lands upon which the Service took suppression action to the appropriate official as noted in Appendix A.

Article X.Authorizing Signatures

Agreed between the parties this _____day of _____.

National Park Service
National Capital Region
Regional Director

COMMONWEALTH OF VIRGINA
State Forester

National Park Service
Northeast Region
Regional Director

Commonwealth of Virginia
State Fire Chief

National Park Service
Southeast Region
Regional Director

National Park Service
Appalachian National Scenic Trail
Project Manager

APPENDIX A

WILDLAND FIRE REPORTING PROCEDURES

PERSONS TO BE NOTIFIED

National Park Service

To report fires or request assistance contact:

Commonwealth of Virginia – Department of Forestry

To report fires or request assistance contact:

Information required on the ICS 209 Incident Status Summery forms will be transmitted verbally or via fax to the numbers listed above.

INFORMATION TO BE PROVIDED ** Attach a copy of ICS209**

REPORTING PARTY _____ _____ - _____ - _____
Name/Agency AC Number

_____
Address, including Zip Code

FIRE NAME _____ DATE OF FIRE _____

LOCATION _____ _____ _____ _____
Twnshp Range Section Meridian

_____
Local Place Name/Park Unit

DISCOVERY _____ _____
Yr/Mo/Day Time (24 Hour)

THREATS TO LIFE/ PROPERTY _____

OBSERVED FIRE BEHAVIOR _____

OBSERVED WEATHER CONDITIONS _____

ACRES BURNED _____ ( ) Actual ( ) Estimated

INITIAL ATTACK _____ _____
Yr/Mo/Day Time (24 Hour)

RESOURCES COMMITTED _____
Engines/Crew(s)/Dozer(s)/Aircraft

REMARKS:

Agreement No. ASIS-NER-01-2006

MEMORANDUM OF UNDERSTANDING

BETWEEN

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

AND

(insert name of Volunteer Fire Department)

ARTICLE I
Background and Objectives

An Agreement by and between the _____Volunteer Fire Department (hereinafter Fire Department), acting by and through the Fire Chief, _____ Volunteer Fire Department, and the United States Department of the Interior, National Park Service, acting by and through the Superintendent, Assateague Island National Seashore (hereinafter Service).

WHEREAS, the Service and Fire Department hereby enter into an Agreement to **PROVIDE MUTUAL AID AND ASSISTANCE FOR OCCURRENCES OF STRUCTURAL AND WILDLAND FIRE** on**,** within, or threatening the adjacent boundaries of Assateague Island National Seashore, and within the response area of the Fire department and

WHEREAS, the Service administers Assateague Island National Seashore, that was established as a unit of the National Park System, United States Department of the Interior pursuant to 16 U.S.C. § 81 –81a; and

WHEREAS, the Director of the National Park Service (or his delegate) is required pursuant to 16 U.S.C. § 1a-1 to authorize only those uses of land within the seashore which will not be a derogation of the values and purposes for which the seashore was established, except as may have been or shall be directly and specifically provided by Congress; and

WHEREAS, 16 U.S.C. 1b(1) authorizes the Secretary of the Interior to render emergency fire fighting and cooperative assistance to nearby fire prevention agencies and for the related purposes outside of the National Park System; and

WHEREAS, The Reciprocal Fire Protection Act of May 27, 1955, 69 Stat. 66; 42 U.S.C 1856a-1856d authorizes reciprocal agreements for mutual aid for fire

protection with agencies maintaining fire protection facilities in the vicinity of Service property and for the property for which said agency normally provides fire protection services; and

WHEREAS, The Wildfire Suppression Assistance Act of 1989; and

WHEREAS, National Park Service Acts as amended (67 Stat. 495; 16 U.S.C. 1b).

WHEREAS, The Fire Department provides fire protection services to residents in their service area in the vicinity of the Service, and has an interest in working cooperatively with the National Park Service; and

WHEREAS, 16 U.S.C. § 1a-1 as amended by the 1978 Public Law 95-250 provides for the promotion and regulation of the various areas of the National Park System so that the authorization of activities be construed and the protection, management and administration of these areas be conducted in the light of the high public value and integrity of the National Park System; and

WHEREAS, the National Park Service has determined that such an agreement is neither incompatible with the public interest nor inconsistent with the use of such lands for Seashore purposes; and

NOW, THEREFORE, both parties do mutually understand and agree as follows:

ARTICLE II
Statements of Work

The Memorandum of Understanding herein made is subject to the following terms and conditions:

(1) The purpose of this Agreement is to provide mutual aid and assistance between Assateague Island National Seashore and the _____ Volunteer Fire Department in those situations where wildland, vehicular, and/ or structural fires threaten or otherwise endanger property under the protection of either agency.

(2) The provisions of said Agreement will be separated into two sections: Structural/ vehicular fires; and wildland (brush, forest, grass) fires.

(3) The area of Service property covered by this Agreement will be that section of Assateague Island National Seashore within or adjacent to the Fire Department's area of responsibility, including other areas in the seashore within which Fire Department assistance may be requested.

(4) Each party to this Agreement agrees to be responsible for the payment of all expenses and/or costs incurred by it which may arise out of its performance under this Agreement or any other fire fire-fighting activities related thereto **except** for those additional contracts that may be in place authorizing payment for services rendered as specifically outlined in equipment rental agreements. (attached).

(5) The Fire Department agrees that all of its employees or agents shall not be considered to be Federal employees for any purpose while carrying out any activity authorized herein.

(6) Any alterations to this Agreement must be in writing and signed by the parties hereto. Renewals will be subject to regulations existing at the time of renewal and such other terms and conditions deemed necessary to protect the public interest.

(7)Each party to this Agreement expressly waives and releases all claims against all other parties to this Agreement for compensation for any loss, damage, personal injury, or death occurring during the performance of this Agreement.

(8) This Agreement and the obligations of the Service hereunder shall be subject to the availability of funds and nothing herein contained shall be construed as binding the Service to expend in any one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purpose of this Agreement for the fiscal year, or to involve the Service in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocations.

(9) Each party to this Agreement will furnish such equipment and personnel to aid and assist the other party as can be made available without jeopardizing the fire protection of its own area of responsibility.

(10) All requests for assistance must originate from the Incident Commander in charge of the incident, regardless of location.

(11) To meet annually, along with other cooperators, for the discussion of matters related to the application of this Agreement, and to provide for other meetings as necessary for the discussion of matters relevant to the prevention and suppression of fires and responses to other all-risk incidents. Exchange information necessary for the coordination of operations, including preparedness, planning, prevention, communications, training, etc.

A. Structural Fires

The Fire department will respond to requests for assistance as promptly as possible and with due regard for the safety of all persons.

(1) When the Fire Department Officer in Charge arrives at the scene of any structural or motor vehicle fire within the boundaries of the seashore, the Officer in Charge of the Fire Department will assume Incident Command responsibility for all firefighting activities until the fire is extinguished and declared out.

(2) As an aid to implementing this Agreement, members of the Fire Department may visit the Assateague Island National Seashore and engage in pre-planning and training activities with Service staff.

B. Wildland Fires

(1) Responsibility for wildland fire suppression activities will normally rest with the agency having jurisdictional control at the location of the fire. Should the assisting agency reach the fire scene first, initial attack will commence immediately under the direction of the Initial Attack Incident Commander and continue until such time as relieved by the Incident Commander designated by the responsible agency. All personnel will remain at the scene of the fire until released by the Incident Commander.

(2) In the event of a wildland fire burning simultaneously on both private land and lands administered by the Service or if the objectives of a suppression operation on any lands considered within the scope of this Agreement can best be met through Unified Command, it is mutually agreed that the entire suppression operation shall be directed through Unified Command, utilizing common objectives. In addition, the incident may be directed by a single Incident Commander, agreed upon by both the Service and the Fire

Department. As a general rule, the Incident Commander will come from the agency that has the greatest jurisdictional involvement. If a single Incident Commander is designated, the Deputy Incident Commander will normally be appointed from the other Agency. Any Delegation of Authority to an Incident Commander for an extended attack on Service lands will be done by the Superintendent of Assateague Island National Seashore through a written Delegation of Authority.

(3) Each party will assist the other in determining the origin and cause of fires and will provide information as requested for the preparation of investigative reports.

(4) During the **first 24-hours** of an incident on Service land, Fire Department personnel may engage in wildland fire suppression activities according to the equipment and training standards established by the Fire Department. **After the first 24- hours** of an incident, they must meet training and equipment standards of the National Wildfire Coordinating Group (NWCG) as outlined in NWCG Standard 310-1. If they are engaged solely in structural protection as an adjunct to the wildland fire suppression effort, they may engage in those activities throughout the duration of the incident under the auspices of their own training and certification.

(5) The Service will, based upon availability of funding and personnel, make every effort to provide training and equipment to the Fire Department to assist them in meeting the training and equipment standards referenced in II B.(4). In return, the Fire Department will make every effort to utilize those personnel that have received the aforesaid training and equipment when responding to initial and extended attack incidents.

ARTICLE III
Term of Agreement

The Memorandum of Understanding hereby made shall terminate five (5) years from the effective date hereof, at noon, Eastern Standard Time, unless prior thereto it is relinquished, abandoned, or otherwise terminated pursuant to the provisions of this Agreement or of any applicable Federal law or regulation. In addition, the Agreement will expire at the end of the specified term unless formally reaffirmed or rewritten if necessary. The effective date of this Agreement shall be the date of its execution by the Superintendent.

Unless relinquished, abandoned, or otherwise terminated pursuant to the provisions of the Agreement or of any applicable Federal law or regulations, the Agreement will be considered for renewal.

ARTICLE IV
Key Officials

The key officials for the parties are:

Superintendent
Assateague National Seashore
7206 National Seashore Lane
Berlin, Maryland 21811

The Fire Chief of the _____ Volunteer Fire Department or his delegate shall direct operations and measures agreed to in this instrument.

_____ Volunteer Fire Department
_____, (State) __(zip)_____

ARTICLE V
Property Utilization

The Fire Department shall maintain and dispose of any property acquired under the terms of this agreement as set forth in Service property management regulations.

ARTICLE VI
Prior Approval

Not applicable.

ARTICLE VII
Reports

Each party to this agreement will provide the other party with fire reports and copies of correspondence directly related to the implementation of this agreement. Reports and correspondence will be directed to the signatories of this Agreement within fifteen (15) working days of the date of the incident.

ARTICLE VIII
Termination

This Agreement may be terminated by either Party by providing sixty (60) days written notice to the other.

ARTICLE IX
Standard Clauses

This Memorandum of Understanding is subject to conditions the Superintendent or his representative, and to all laws, regulations, and policies governing the National Park Service and other applicable conditions as outlined herein.

During the performance of this Agreement, the parties agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex, or national origin. The parties will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex, or national origin.

No member or delegate to Congress or resident Commissioner shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this Agreement if made with a corporation for its general benefit.

This Agreement constitutes the full, complete, and entire agreement between the National Park Service and the _____ Volunteer Fire Department. No modification or amendments of this Agreement shall be binding on any party hereto unless such modification or amendment shall be in writing, executed in duplicate by the Service and the Fire Department, attached to this Agreement and incorporated in and by reference made a part of this Agreement.

ARTICLE X

Authorizing Signatures

IN WITNESS WHEREOF, the Superintendent of Assateague Island National Seashore, acting on behalf of the United States Department of the Interior, National Park Service, in the exercise of the delegated authority from the Secretary of the Department of the Interior, has caused this Memorandum of Understanding number **ASIS-NER-01-2007** to be executed this ____ day of _____, **2007**.

Superintendent, Assateague Island National Seashore

ACCEPTED THIS ___ DAY OF _____, 2007__.

_____
Fire Chief
_____ Volunteer Fire Department

United States Department of the Interior
National Park Service
Assateague Island National Seashore
7206 National Seashore Lane Berlin, Maryland 21811

Agreement Number GA 4190-3-0001

GENERAL AGREEMENT

DOCUMENTING A FIRE-FIGHTING ASSISTANCE RELATIONSHIP

BETWEEN

**UNITED STATES DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE
ASSATEAGUE ISLAND NATIONAL SEASHORE**

AND

**BERLIN FIRE COMPANY INCORPORATED
BERLIN, MARYLAND**

I. BACKGROUND

A. Purpose

1. The purpose of this General Agreement (hereinafter "GA") is to provide personal services and equipment required for prevention/suppression of vehicle, structural fires and the protection of life and property from these fires within **Assateague Island National Seashore** (hereinafter "Park"). The Park will respond in kind, within limits, to requests for emergency assistance from nearby fire prevention agencies.

B. Authority

1. Statutes 42 USC 1856 and 16 USC lb (1) provide authority for the National Park Service (hereinafter NPS) to enter into reciprocal agreements and to render emergency fire fighting and Cooperative assistance to nearby fire prevention agencies to extinguish fires and preserve life and property.

2. The Chief of the **BERLIN FIRE COMPANY INCORPORATED** (hereinafter "Department") has signature authority to enter into agreements with the Park regarding fire prevention and suppression services on Park-administered land.

3. The Park Superintendent has signature authority to enter into agreements with the Department regarding fire prevention and suppression services on Park-administered land, and to provide reciprocal assistance.

II. STATEMENTS OF WORK

A. Fire on Park-Administered Land

In the event of a structural, vehicular, hazardous materials or wildland fire on Park Administered land:

1. The Department agrees to:

a. Immediately notify the Park of such a fire, by contacting the Park by phone through **Chincoteague VA Police Dispatch (757) 336-3155**.

b. Respond to the fire with a minimum of one pumper unit, if available, and a qualified crew, unless notified by the Park that such resources are not needed. The definition of "qualified crew" is a crew that meets or exceeds state fire certifications standards.

c. Cooperate with the Park staff in the immediate suppression of all structural, vehicular or hazardous material incidents and all wildland fires.

d. Cooperate with the Park under a Unified Incident Command, by assuming the Incident Commander role on fires involving vehicles, structures or hazardous materials.

e. Recognize that Park/NPS policies and requirements, especially those concerning the use of vehicles and other equipment off of roadways, may necessitate using fire-fighting procedures that differ from Department procedures.

f. When suppressing any type of fire, the Department agrees, insofar as is possible, to maintain the point of origin for the purpose of investigation by NPS personnel.

g. When suppressing fires near or within historical structures or structures containing museum collections, the Department agrees to modify its suppression tactics in order minimize damage to collections and historical fabric.

2. The Park agrees to:

a. Immediately notify the Department of a fire by contacting the **Worcester County Central Dispatch 911 or (410) 632-1111**.

b. The Department will assume the lead suppression role in fires involving vehicles, structures or hazardous materials.

c. Provide qualified wildland fire fighting personnel to assist with suppression of wildland fires; or in cases of structural, vehicular or hazardous materials fires, to assist only with .

d. Provide traffic control and emergency medical assistance for injured persons in either type of fire.

e. Conduct walk-through inspections for the Department to familiarize Department personnel with building floor plans and sensitive areas, to include museum collections and structures of historical significance.

f. Solicit and accept recommendations from the Department command personnel in suppression and rescue procedures, insofar as they do not conflict with Park/NPS policies. For the purpose of this GA, Department command personnel are:

1) Fire Chief

2) Assistant Chief

B. Fire Adjacent to Exterior Park Boundaries

In the event of a fire on land within 3 miles of the Park boundary:

1. The Park agrees to:

a. Provide traffic control and/or emergency medical assistance for injured persons in either type of fire.

b. Recognize and follow orders from the Department command personnel or appropriate city/state authority.

c. The Park will maintain all existing and all new alarm systems in buildings to the National Fire Protection Association (NFPA) Life Safety Code.

2. The Department agrees to:

a. Establish a clear command structure and provide orders and instructions to Park personnel.

C. Operations

1. Department personnel and equipment will be activated as follows:

a. Emergencies - The Park will request emergency assistance by contacting the Department Dispatcher **Worcester County Central Dispatch 911 or (410) 632-1111**.

b. Business - The Park will initiate business contacts by calling the Department Dispatcher or Chief at: (410) 641-2770 or by calling the 911 Dispatch non-emergency number at: 410 632-1111.

2. Park personnel and equipment will be activated as follows:

a. The Department will request emergency assistance by contacting the Park through **Chincoteague VA Police Dispatch (757) 336-3155.** This is a 24-hour dispatch and Park personnel will be notified at any time.

b. Business - The Department will initiate business contacts by calling: Chief Ranger Mike Anderson (410) 641-1443 ext. 223.

D. General Provisions

1. The Park and the Department mutually agree to the following:

a. In the execution of this GA, employees or agents of the Department are not considered employees of the Park or NPS for any purposes.

b. No party to this agreement shall be bound to make any expenditure under this GA, except as may be authorized by law.

c. The Park and the Department waive all claims against each other for compensation for any loss, damage, personal injury or death occurring as a consequence of activities pursuant to this Agreement.

d. All fire suppression-qualified Park personnel will meet, at a minimum, the requirements found in Director's Order and Reference Manual 18.

e. All fire suppression-qualified Department personnel will meet the minimum requirements of the Department.

f. The respective parties of this GA will provide personal protective equipment (PPE) for their employees.

g. Both parties will review this GA annually to update changes in Park or Department personnel or phone numbers and provide the other party with a list of any changes made.

III. AGREEMENT EVALUATION

1. The parties will jointly review the results and effectiveness of this GA at the end of each calendar year. The GA may be amended at any time with the written, mutual consent of the parties. The approved amendment(s) will immediately become part of this GA.

IV. TERM OF THE GENERAL AGREEMENT

1. This GA shall be in effect for a period of five (5) years, commencing on the date of signature of the Park Superintendent.

V. KEY OFFICIALS

A. Park -The Superintendent has the authority and responsibility for managing this GA on behalf of the Park. He/she may be contacted at (410) 641-1443 ext 209.

B. Department - The Chief has the authority and responsibility for managing this GA on behalf of the Department. He/she may be contacted at (410) 641-~~2770~~. 641 1977

VI. REPORTS

A. The respective parties to this General Agreement are responsible for their own timekeeping and other required records and reports.

B. The Department agrees to assist the Park in the completion of the NPS Fire Report as it relates to origin, cause and estimated damages.

VII. TERMINATION

A. This General Agreement may be terminated by either party by providing written notice to the other party sixty (60) days in advance of the termination.

VIII. ATTACHMENTS

A. The following attachments are included as a part of this document:

1. A list of the equipment that **BERLIN FIRE COMPANY INCORPORATED** will offer to the Park if it is needed.

Building diagrams for Park structures to include the location of all hazardous materials. (Attached) **Note: There are no hydrants on site.**

4. Alarm company name, phone number and notification procedures. **Choptank Security Systems, Inc. (410) 479-4345.**

IX. REQUIRED CLAUSES

A. **NON-DISCRIMINATION:** All activities pursuant this agreement and the provisions of Executive Order 1 1246; shall be in compliance with requirements of Title VI of the Civil Rights Act of 1 964 (78 Stat. 252 42 U.S.C. § 2000d et se~q.); Title V, Section 504

of the Rehabilitation Act of 1973 (87 Stat. 394; 29 U.S. C. §794); the Age Discrimination Act of 1975 (89 Stat. 728; 42 U.S.C. § §6101 et seq.); and with all other Federal laws and regulations prohibiting discrimination on grounds of race, color, national origin, handicap, religion or gender in providing of facilities and service to the public.

B. **CONSISTENCY WITH PUBLIC LAWS:** Nothing herein contained shall be deemed to be inconsistent with or contrary to the purpose of or intent of any Act of Congress establishing, affecting, or relating to the Agreement.

C. **APPROPRIATIONS** (Anti-Deficiency Act, 31 U.S.C. 1341)**:** Nothing herein contained in this Agreement shall be construed as binding the Service to expend in any one fiscal year any sum in excess of appropriations or allocations made by Congress, for the purposes of this Agreement for that fiscal year, or other obligation for the further expenditure of money or allocations in excess of such appropriations.

D. **OFFICIALS NOT TO BENEFIT:** No Member of, Delegate to, Resident Commissioner in, Congress shall be admitted to any share or part of this Agreement or to any benefit to arise there from, unless the share or part benefit is for the general benefit of a corporation or company.

Superintendent Michael Hill — 3/12/04 Date

Fire Chief — 3/22/04 Date

APPENDIX O

INTERAGENCY CONTACTS

Assateague Island National Seashore

Interagency Contacts

National Park Service

Shenandoah National Park	Area Fire Management Officer, Shenandoah NP 540 999-3441 Fire Program Assistant, Sue Imler 540 999-3442 Fire Ecologist, KellyAnne Gorman 540 999-3393 FAX 540 999-3644 Eastern Interagency Coordination Center/ Communications Center 540 999-3422 or 1 800 732-0911
Northeast regional office	Doug Wallner, Fuels/ Fire Ecology Program Manager (215) 597-7140 Cell (215) 266-2612 FAX (215) 597-0351

U.S. Forest Service

George Washington/ Jefferson National Forest	Supervisors Office 540 265-5100 Dispatch Office 540 265-5221 Air Tanker Base (Weyers Cave) 540 234-9301

Virginia Department of Forestry

Accomack County Robbie Lewis, Forester Donnie Davis, Technician Pre Trower, Technician	County Office (757) 787-5812 (757) 789-3767 (FAX)
Waverly Regional Office (Accomack County) Regional Forester, Ed Zimmer	Regional Office 804 834-2300 FAX 804 834-3232
Charlottesville Central Office	Wildland Fire Operations, John Miller 434 977-6555 FAX 434 296-2369

Maryland DNR – Forest Service

Worcester County Snow Hill, Maryland	Nassawango Work Center (410) 632-1955

Fire Departments (MD)	Emergency	Non-Emergency	Contact
Berlin Volunteer Fire Company	911	(410) 641-1977 (410) 641 1366	Headquarters Station 2
Ocean Pines Volunteer Fire Company	911	(410) 641-8272 (410) 641-8878	South Sta. North Sta.

Fire Departments (VA)	Emergency	Non-Emergency	Contact
Chincoteague Volunteer Fire Co	911	(757) 336-3138	Chief
Accomack County Department of Public Safety Tasley, VA		(757) 789-3610	Fire Marshall

National Weather Service

Wakefield Forecast Office	Fire Weather Forecaster	540 552-0084
	General Forecasts	540 552-0497

Virginia Department of Environmental Quality

Tidewater Regional Office	Air Permit Manager, Jane Workman	757 518-2112

Virginia Interagency Coordination Center

VICC 900 Natural Resources Drive, Suite # 800 Charlottesville, VA 22903	434 977-1375 ext 3450

APPENDIX P

FIRE RELATED AGREEMENTS

INTER-AGENCY AGREEMENT FOR FIRE MANAGEMENT

Among the

BUREAU OF LAND MANAGEMENT

BUREAU OF INDIAN AFFAIRS

NATIONAL PARK SERVICE

U.S. FISH AND WILDLIFE SERVICE

of the

UNITED STATES DEPARTMENT OF THE INTERIOR

and the

FOREST SERVICE

of the

UNITED STATES DEPARTMENT OF AGRICULTURE

BLM Agreement No. 1422RAI03-0001
FS Agreement No. 02-IA-11132543-21
FWS Agreement No. 93252-3-H-001
BIA Agreement No. AG-2002-K097
NPS Agreement No. F00001-03-0011

I. INTRODUCTION.

Fire management in the nation s wildlands is an on-going concern to the American public and to the land management bureaus of the Department of the Interior and the Department of Agriculture, Forest Service, hereafter "agencies. " Considerable progress has been made in fire management planning, fire use, and fire suppression by all agencies and continued progress can be achieved by concerted cooperation and coordination among the agencies. Because fire recognizes no boundaries, programs must lead to more productive cooperation and efficient operations among these agencies.

II. AUTHORITY.

A. Protection Act of 1922 (16 U.S.C. § 594).

B. Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 42 U.S.C. § 1856a).

C. Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. § 1535), as amended.

D. Federal Land Policy and Management Act of 1976 (43 U.S.C. § 1702).

E. National Park Service Organic Act of August 1916 (16 U.S.C. § 1).

F. National Wildlife Refuge Administration Act of June 27, 1998 (16 U.S.C. § 668dd)

G. Disaster Relief Act of 1974 (42 U.S.C. § 1521).

H. National Indian Forest Resources Management Act of 1990 (25 U.S.C. § 3101).

I. Cooperative Forestry Assistance Act of 1978 (P.L. 95-313, 92 Stat. 365 as amended; 16 U.S.C. § 2101 (note), 2101-2103, 2103a, 2103b, 2104-2105).

III. OBJECTIVE.

A. To provide a basis for cooperation among the agencies on all aspects of wildland fire management and as authorized in non-fire emergencies.

B. To facilitate the exchange of personnel, equipment (including aircraft), supplies, services, and funds among the agencies.

IV. PROGRAM COVERAGE.

The agencies agree to cooperate in the full spectrum of wildland fire management activities, and in non-fire emergencies as authorized, to achieve land management goals. Cooperative efforts shall be provided at the national, geographical, and local levels to facilitate efficient use of personnel, supplies, equipment, training, public education, aviation services and other resources. Activities may include, but are not limited to:

A. Prevention of human-caused wildland fires;

B. Training of personnel to agreed common standards;

C. Preparedness for wildland fire suppression;

D. Suppression of wildland fires;

E. Emergency stabilization and rehabilitation of areas burned by wildland fires, and may include Burned Area Emergency Rehabilitation (BAER) work;

F. Development and exchange of technology and databases;

G. Development and distribution of cost information;

H. Fuels management, including prescribed fires;

I. Identification and establishment of interagency fire management resources;

J. Development of annual local, geographical, and national operating plans;

K. Fire research, administrative/management studies, and technology development;

L. Interagency Joint Fire Science/Research and Management projects; and

M. Rural fire assistance.

V. STATEMENT OF WORK.

A. Agencies will develop mutually beneficial fire management plans, including activities previously identified in Section IV.

B. Agencies will develop cooperative arrangements to cover administrative and jurisdictional responsibilities that will provide for:

1. Use of closest-forces and total mobility concepts for wildland fire suppression, including personnel, equipment, and supplies;

2. Development and use of fire equipment and supply caches compatible with total interagency requirements by local, geographical, and national needs;

3. Training to mutually agreeable common standards and curricula;

4. Mutually acceptable performance qualifications and standards for all fire management positions;

5. Mutual assistance for managing wildland fires that are managed for resource benefits; and

6. Mutual assistance for conducting hazardous fuels reduction, wildland urban interface treatments, and ecosystem restoration and maintenance using prescribed fire.

C. Agency representatives shall coordinate and exchange fire management plans, to include information on available personnel, equipment and supplies as necessary.

D. Agencies will mutually monitor fire suppression equipment and supplies to assure that proper distribution and quantities are on hand to meet potential needs.

E. Unless otherwise provided for, an agency is expected to take prompt initial action, with or without request, on wildland fires within zones of mutual interest. Where

one agency takes initial action in the protective unit of the other, the initially acting agency shall continue to fight the fire until relieved by an officer of the designated management agency.

F. When wildland fires burn on, or threaten, lands of more than one agency, joint planning will be conducted by local officials of the representative agencies to suppress the wildland fire.

VI. BILLING/PAYMENT PROCEDURES.

A. Billing procedures for fire management activities are as follows:

1. Emergency Fire Suppression - Agencies shall not bill for services rendered to the signatory agencies of this Agreement except by mutual agreement when an agency has exhausted all other provisions and resources for internally funding suppression activities.

2. Severity – Agencies shall not bill for services rendered pursuant to a Severity Request for wildland fire resources made by signatory agencies to this Agreement.
"Severity Request" is defined as authority to access suppression funds on a case-by-case basis, in addition to preparedness funds, to mitigate losses when abnormal fire conditions occur.

3. Fire Management Projects - Agencies may choose to bill one another by mutual agreement once they have exhausted all other provisions for internally funding mutual assists, as provided in A.7, below. (See activities listed in Section IV, Program Coverage.)

4. Fire Preparedness – Agencies may choose to bill one another by mutual agreement for fire program management and readiness activities paid with wildland fire preparedness funds.

5. Mobilization of State Fire Suppression Resources – The Forest Service will pay costs for Interstate assistance incurred by the State providing resources. Intrastate assistance will be paid by the receiving Forest Service/Interior agency as provided by local Federal agency/State Agreements.

6. Emergency Stabilization and Rehabilitation – Agencies shall not bill for fire rehabilitation planning services rendered by the signatory agencies of this Agreement. Agencies may choose to bill one another by mutual agreement for fire rehabilitation implementation.

7. The Interior agencies have agreed to not reimburse one another for services rendered to one another under the budget Activity codes for

"Hazard Fuels Reduction Operations" and "Wildland Urban Interface" except as follows below in paragraphs a. and b.

a. Each Interior agency will retain reserve funds for these activities at the national, state or regional levels that will be used to establish interagency assist accounts. Local field units can charge these assist accounts when they render assistance to neighboring agencies. If an agency exhausts its reserve funds for interagency assistance, projected deficiencies will be covered through interagency funding transfers, following normal departmental protocols.

b. The Interior agencies agree to use their assist accounts to provide project assistance to the Forest Service. The Forest Service agrees to establish comparable reserve funds at the regional or National Forest level that can be used to assist Interior agencies with Hazard Fuels Reduction and Wildland Urban Interface projects. Interior agencies and the Forest Service may seek reimbursement from each other once reserve funds have been exhausted and there is no opportunity to use reciprocal services to achieve performance targets.

B. Billing and collection procedures will follow the Intra-governmental Payment and Collection (IPAC) system process.

C. Each agency shall, upon request, forward specific cost information for billings.

D. Indirect administrative surcharges will not be assessed by any signatory agency for preparedness activities performed for another agency.

E. Indirect administrative fees of signatory agencies for Fire Research and Development and Joint Fire Science Program administrative activities cannot exceed 15 percent for an agency's internal activities and 10 percent for pass through activities. Fees in excess of these limits must be justified and have mutual agreement by the affected parties that are signatory to this Agreement.

VII. GENERAL PROVISIONS.

A. Each agency shall make direct settlement from its own funds for all liabilities it incurs under this Agreement.

B. Parties to this Agreement are not obligated to make expenditures of funds under terms of this Agreement unless such funds are appropriated for the purpose by the Congress of the United States, or are otherwise legitimately available under the annual Appropriations Acts. If some extraordinary emergency or unusual circumstance arises that could not be anticipated and that could involve

expenditures in excess of available funds for the protection of life or property, the affected agency or agencies shall immediately seek supplemental appropriations or permission for reprogramming to meet their respective shares of such emergency obligations.

C. This Agreement will take effect on the date of the last signature. The AgreemenT shall remain in effect until September 30, 2008. Any signatory agency may terminate its participation in this Agreement by written notice to all other signatories provided that such notice shall be given between the dates of October 1 of any year and February 1 of the following year. The termination will become effective immediately upon the date of notice. Full credit shall be allowed for each party's expense and all non-cancelable obligations properly incurred up to the effective date of termination. In such case, this Agreement will remain in full force and effect with respect to the remaining signatory agencies.

D. Amendments and modifications to this Agreement may be initiated by any signatory agency. The amendments and modifications shall not take effect until documented and signed by all signatory agencies. The Bureau of Land Management is designated as the agency responsible for all administrative oversight of amendments and modifications to this Agreement.

E. Financial obligations, as warranted, under this Agreement, to accomplish activities under Section IV, must be approved for each agency by the responsible officers at the appropriate level operating within their authority, and funding will be obligated by task orders under this Agreement, except under IV.D, which will be accomplished through Resource Orders when required.

F. The *Reciprocal Fire Protection Act* specifically authorizes the execution of agreements between agencies of the United States, and other agencies and instrumentalities for mutual aid in fire protection and other fire management purposes. An Economy Act Determination to support reimbursement is not required in these instances. The Economy Act applies when more specific authority does not exist, as stated in the *Federal Acquisition Regulations* (FAR) §17.500(b).

VIII. TASK ORDERS.

A. Specific projects to be funded and performed under this Agreement shall be identified in separate task orders developed among the agencies involved in each project. Task Orders will contain the following minimum information:

1. Detailed description of services to be performed or supplies to be delivered;

2. Description of the deliverables;

3. Time period for completion;

4. Target cost/price;

5. Identify responsible project officials for each agency;

6. Payment procedures will follow the Intra-governmental Payment and Collection (IPAC) system process, which includes identification of codes, advance payments or reimbursement; and

7. Task Orders must be signed by authorized personnel with authority to obligate and commit funds for each agency.

B. Task Orders may be prepared in any format acceptable to the agencies involved in each project.

IX. WAIVER.

Each party to this Agreement does hereby expressly waive all claims against the other party for compensation for any loss, damage, personal injury or death occurring in consequence of the performance of this Agreement.

X. DURATION; SUPERSEDES PRIOR AGREEMENT

This Agreement is effective on the last date of execution and will remain in effect until September 30, 2008. This Agreement supersedes "The Interagency Agreement between the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service, of the United States Department of the Interior, and the United States Forest Service of the Department of Agriculture" effective February 20, 1997, and all amendments and modifications thereto.

/s/ J. M. Hughers for 9/11/02
Kathleen Clarke, Director Date
Bureau of Land Management

/s/ Richard A. Harter 10/01/02
Richard A. Harter, Suprv. Contract Officer Date
Bureau of Land Management, NIFC

/s/ Dale N. Bosworth 09/23/02
Dale N. Bosworth, Chief Date

Forest Service

*/s/ Terrance Virderi*_____ 09/24/02
Terrance Virderi, Deputy Commissioner Date
Bureau of Indian Affairs

*/s/ Steve Williams*_____ 10/01/02
Steve Williams, Director Date
Fish and Wildlife Service

/s/ Fran P. Mainella _____ 09/30/02
Fran P. Mainella, Director Date
National Park Service

APPENDIX Q

FIRE MONITORING PLAN

(Due to the size of this portion of the Fire Management Plan, the fire monitoring document has been included as an addendum to this plan under a separate cover)

APPENDIX R

INDIVIDUAL FIRE REPORT FORM

DI 1202

APPENDIX R
Individual Fire Report Form, DI 1202

UNITED STATES DEPARTMENT OF THE INTERIOR DI-1202 INDIVIDUAL FIRE REPORT 1. STATUS CODE _ 2. REPORTING AGENCY _	3.a. UNIT B. SUB-UNIT C. YEAR D. FIRE NUMBER __ ___ __ ____	4. TYPE 5. CAUSE 6. PEOPLE 7. NRVC __ ___ _

8. STATISTICAL DATA

	a. STATE	b. OWNER	c. VEGETATION	d. ACRES BURNED
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._
	__	_	_	_____._

9. AGENCY DATA

a. FIRE NAME	b. AREA NAME	c. LATITUDE LONGITUDE	d. TWNSHP RANGE SECTION MERIDIAN
_____	____	__:__:_ __:__:__	____ ____ __ __

e. COST CODE	f. OWNER	g. FY	h. FISCAL DATA	i. UTM
_	_	____	_____	Z___ E ___.___ N____.__

10. FIRE MANAGEMENT DATA

	DATE	TIME	TYPE	AMT XXXXXXXXXX XXXXXXXXXX	ACRES
a. DISCOVERY/START	_____	____	_		_____._
b. INITIAL ATTACK	_____	____	1 2 3 _ _ _	1 2 3 __ __ __	_____._
c. CONTROLLED	_____	____			_____._
d. DECLARED OUT	_____				

11. SITE DATA

a. TOPOGRAPHY	b. ASPECT	c. SLOPE	d. ELEVATION	e. STATION	f. MSGC	g. BEHAVIOR	h. B. I.	I. ADJ CLASS
_	_	_	_	_ _ _ _ _ _	_ _ _ _ _	_	__	_

12. PREVENTION DATA

k. DAY OF WEEK	l. WAS FIRE INVESTIGATED (Y/N)	m. FIRE CAUSE SUSPECT, KNOWN OR UNKNOWN (K/U)	n. SUSPECT = RESIDENT, TRANSIENT OR UNKNOWN (R/T/U)
_	_	_	_

13. PRESCRIBED FIRE DATA

c. PLOT/ BURN OBJECTIVE	d. FIRING TYPE	e. COST/ACRE	f. FBPS FUEL MODEL	I. PROJECT #
___	__ __	_ _ _ _ _ _._ _	_ _ _ _	

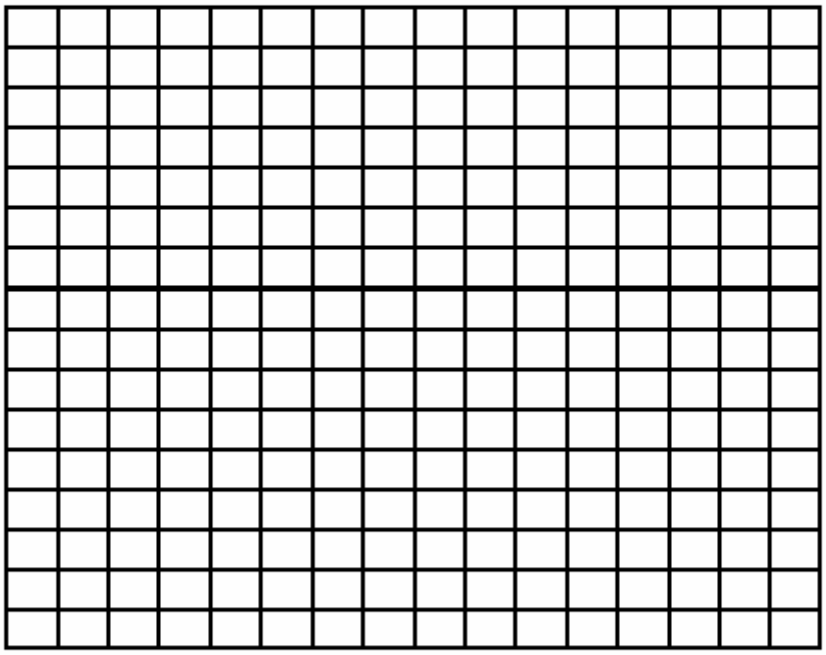
m. COMPLEXITY / FIRE MANAGEMENT AREA	n. FUEL LOADING FOR EMISSIONS			o. BENEFITTING PROGRAM
	SIZE CLASS OF FUELS	PRE-BURN LOADING TONS PER ACRE	CONSUMPTION PERCENT	
	Shrub/Herb	___._	___	
	0 - 1	___._	___	
	1.1 - 3.0	___._	___	
	3.1 - 9.0	___._	___	
	9+	___._	___	
	LITTER & DUFF (INCHES)	___._	___	

NARRATIVE - Enter information about the fire.

TITLE INFORMATION - (Mandatory)
Submitted by:
Submitted Title:
Submitted Date:
Entered by:
Entered Title:
Entered Date:

MAP: - (Optional)

LOCATION PLAT SCALE: " = 1 MILE



APPENDIX S

FIRE EQUIPMENT INVENTORY

Assateague Island National Seashore

Fire/Incident Cache Inventory

Inventory completed by: Jeanne Feltes

Date: January 15, 2005

Jeanne Feltes, Fire Coordinator

Item Description	Type/Size	Quantity
Leather gloves:	Small	1
	Medium	0
	Large	1
	Extra Large	3
Goggles		9

Item Description	Type/Size	Quantity
Bedding/Shelters:		
Tent (backpack)		0
Tent (non-backpack)		1
Sleeping bag	Blue nylon	3
Sleeping bag	Yellow nylon	4
Sleeping bag	Cotton Disposable (new)	1
Sleeping bag	Cotton Disposable (used)	6
Accessory bag (tent/pad size)		2
Wool blanket	Grey	4

Item Description	Type/Size	Quantity
Gear:		
Field pack	Red firefighter	5
Yellow accessory pack	Yellow firefighter	7
Webbing	Yellow	8
Carrier bag with plastic insert, for fire shelter	Yellow	6
Fire shelter with carrier	Yellow	7
Water bottle		21
Water bottle holder	Yellow nylon	20
Water bottle holder	White duck	10
Canteen	Round grey	3
Personal first aid kit	White plastic	5
Head lamp	Red plastic	12
Head lamp	Red metal	3

Item Description	Type/Size	Quantity
Personal Protective Equipment:		
Shirt, Fire Resistant:	Extra Small	3
	Small	8
	Medium	11
	Large	8
	Extra Large	6
Pants, Fire Resistant:	26	3
	28	1
	30	5
	32W 30L 32W 34 L	11 2
	34W 30L 34W 34 L	3 4
	36W 30L 36W 34 L	5 8
	38W 30L 38W 34 L	0 0
Helmet with fire resistant hood	Old type plastic	8
	Old type aluminum	4

5

Item Description	Type/Size	Quantity
Leather gloves:	Small	1
	Medium	0
	Large	1
	Extra Large	3
Goggles		9

APPENDIX T

FIRE PERSONNEL CALL-UP LIST

Anderson, Henry
Barrett, Richard
Budzynski, Martin
Chase, Jonathan
Condren, Dana
Davis, Mary E. (Liz)
Ennis, Ishmael (Ish)
Feltes, Leanne
Garrett, Todd
Hansen, Adella
Johnson, Christopher Todd
McKelvey, Ryan
Morlock, Theodore
Rapp, David
Seymour, Chris

APPENDIX U

WILDLAND FIRE PREVENTION ANALYSIS AND PLAN

Wildland Fire Prevention Analysis and Plan

Assateague Island National Seashore

Introduction

National Park Service areas, such as Assateague Island National Seashore, are potentially placed at special risk from the effects of unplanned wildland fire ignitions. A number of factors can potentially combine to lead to damage and/ or destruction of these national treasures. By their very nature, National Parks have been created to protect the nation's unique and often irreplaceable cultural and natural resources. Cultural resources are placed at increased risk primarily due to a number of factors. Consider:

1. Many of the historic structures found in the parks were constructed during the time period when building codes, fire resistant construction techniques, fire resistant building materials, and planning concerning protection from unplanned ignitions, were non-existent.

2. Historical building materials, with wood and timber products predominating, were used primarily because of their availability, not their resistance to flammability.

3. The passage of significant periods of time have served to "cure" these materials and make them even *more* fire prone than when they were originally constructed.

4. Historic structures are often located in areas where they are surrounded by highly flammable grass, brush and forest fuels.

5. Because of their historical status, many structures have not been modified with modern fire detection and suppression systems. Access to fire suppression response resources is often very limited, largely due to the isolated nature of many National Park Service areas. When resources are nearby, their access is often limited by narrow access routes that were primarily designed for human and horse travel, and were not constructed for modern fire suppression apparatus.

6. Historic resources in National Park areas are subjected to intense visitation by the public. The presence of large numbers of visitors in and around these resources increases the potential for ignition from human-caused activities. Facilities that attract visitors such as trails, picnic areas, and campgrounds further increase the potential for ignition from activities such as cigarette smoking and the use of charcoal grills and campfires. These activities often can be found in close proximity to the values at risk (resources to be protected).

7. Cultural resources are almost always located in contextual scenes that serve to enhance the existence of the resource. This often means that, in addition to the historic resource itself, the natural resources surrounding the cultural resource are often in, from a natural resources standpoint, a decadent condition. For example, forests and vegetation in or around historic structures have often been manipulated. For example, the suppression of natural wildfires has allowed forest fuels to accumulate, often to hazardous levels. In addition, extensive damage to the forest has been wrought by insects, wind, and ice and storm damage. This greatly increases the flammability of the forest and incrementally increases the potential for unscheduled wildland fire ignitions. Fires occurring in locations where these conditions are present will necessarily be more intense and provide greater resistance to control than if the forest had been treated with prescribed fire, non-fire treatment, or a combination of both. Prescribed fire also has been proven to be very effective in replicating natural processes that reduce hazardous fuel loadings, promote vegetation diversity, and reduce risk from unplanned wildland fire ignitions.

8. Other factors such as lack of funding and reductions in staffing can lead to the potential for reduced protection of both cultural and natural resources. Many sites are not supervised on a daily basis, and seashore managers often are forced to depend upon infrequent patrols to provide a deterrent to vandalism and fire.

9. There is a general lack of adequate pre-planning for resource protection with entities responsible for wildland fire response. For example; many small parks have inadequate staff, both in terms of numbers and training, to adequately respond to wildland fires in their own areas. As a result, cooperating agencies are expected to provide suppression protection for both wildland and structural fires. This responsibility is often undertaken with little or no thought to planning and appropriate action should the need for an emergency response occur.

Prevention and Protection Activities

Wildland fire will find the weakest link in any defensive measures that have been taken to protect property. The primary determinant of a structures ability to survive the effects of a wildlfire is the composition of its roofing material and the quality of the "defensible space" surrounding the structure. By taking the small steps necessary in protecting park structures, management will render them much more likely to withstand the negative impacts of a wildland fire. Here are some important measures that management can take to protect and preserve the historic structures and cultural resources found at Assateague Island National Seashore.

- Ensure adequate ***defensible space***.

  Defensible space is an area around a structure where fuels and vegetation are treated, cleared, or reduced to slow the spread of a wildlfire towards a structure. This also lessens the probability that a structural fire will spread from a structure into adjacent fuels, thus increasing the fire's size and intensity. In addition, defensible space provides the room for firefighters to do their jobs. A structure is much more likely to withstand a wildfire if grasses, brush, trees, and other common fuels are managed in such a manner that a fires intensity and speed of movement are reduced.

Creating an effective defensible space involves developing a series of management zones in which different treatment techniques are used. ***Every building*** at the seashore should have adequate defensible space *including,* storage buildings, barns, sheds, garages, and other incidental structures.

Ecosystems are dynamic in nature. They are in a constant state of change. Trees and shrubs continue to grow, plants die and /or are damaged, new plants take seed and begin their growth cycles, and living plants drop needles and leaves as they undergo seasonal changes. For these reasons, the perpetuation of the defensive zone requires constant maintenance. The following checklist should be reviewed annually to determine what maintenance is necessary:

- Trees and shrubs are properly thinned and pruned within the defensible space. Slash from thinning activities is disposed of according to established procedures.
- Accumulations of heavy dead and downed fuels are located and treated.
- Roofs and gutters are free from debris (leaves and needles)
- Branches overhanging roofs and chimney are removed.
- Wooden shake roofs are treated with fire retardant (every 5 years)
- Chimney screens in place clear.
- Grass and weeds are mowed to the acceptable height (generally <3 inches).
- Fire Hydrants are tested and in good working order.
- Fire extinguishers are checked annually and in good working order.
- Agreements with local cooperators (VFD's/ local government) are current.
- Communications and initial attack procedures are established and reviewed annually.
- Access roads are cleared and are wide/ tall enough for local apparatus.
- Bridges meet the weight and size requirements of firefighting apparatus.
- Values at risk maps (natural and cultural) are current and available to suppression resources.
- There is a readily accessible tool storage area for fire tools.
- Attic, roof, eave and foundation vents (if applicable) are screened and in good condition.

The actual design and development of site specific defensible space depends upon several factors: size and shape of the buildings, materials used in their construction, the slope of the ground on which the structures are built, surrounding topography, and sizes and types of vegetation (fuels) in the area.

- ***Management Zones***

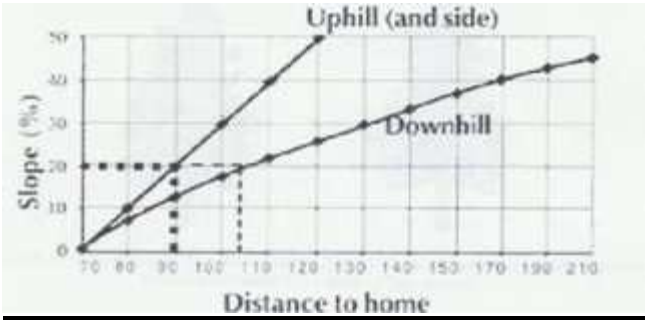
Zone 1 is the area of maximum modification and treatment. It consists of an area 15 feet around the structure in which ***all flammable vegetation*** is removed. This distance is measured from the outside edge of the structures eaves and any attached structure such as a shed or deck.

Within this zone, several specific treatments are recommended. Nothing should be planted within 3 to 5 feet of the structure, particularly if the building is sided with wood, logs, or other flammable materials. If possible, decorative rock provides an effective flame resistant ground cover. Barring the use of these types of materials, closely cropped cool season grasses provide a very effective ground cover under most but the most severe of drought conditions. Mulch is a ***very flammable*** material that ignites easily. Do ***not*** use this material in zone 1.

If the structure has noncombustible siding, widely spaced foundation plantings of growing shrubs or other low flammability plants are acceptable. (For a list of flammable and non-flammable plants, see Appendix Z). Do not plant directly beneath windows or next to gaps in the foundation. Plants in this zone should be frequently pruned in order to ensure vigorous growth and a low ground habitat. Remove dead branches, stems and leaves.

Do ***not*** store firewood or other combustible materials in this area. If decks are present, enclose or screen. Extend the gravel coverage under decks. Do ***not*** use areas under decks for storage. Ideally, remove all tress from zone 1 to reduce fire hazards. If trees must be kept, consider it a part of the structure and extend the distance of the entire defensible space accordingly. Isolate the tree from any other surrounding trees. Prune to at least 8 to 10 feet above the ground. Remove any branches that interfere with the roof or that are within 10 feet of the chimney. Remove all "ladder fuels" from beneath the tree. (Ladder fuels are small shrubs, trees, tree limbs and other materials that allow fire to climb into the tree crown, the branches and the foliage.

Zone 2 is an area of active fuel reduction. Its purpose is to serve as a transitional zone between zones 1 and 3, and to reduce the intensity of any fire approaching the structure. The size of Zone 2 depends upon the slope of the ground where the structure is built. Typically, the defensive space should extend at least 75 to 125 feet out from the structure. The figure below illustrates the appropriate distance for the range of protection for most structures. Within this zone, the continuity and arrangement of vegetation should be considered for modification. Stressed, diseased, dead, or dying trees and/ or shrubs should be removed in their entirety. Any access roads/ lanes, etc should also have the vegetation thinned along their edge so as to provide for unimpeded access and egress by fire suppression apparatus.



This chart indicates the minimum dimensions for defensible space from a structure to the outer edge of zone 2. For example, if the structure to be protected is situated on a 20% slope, the

minimum defensible space dimensions would be 90 feet uphill and to the sides of the structure and 104 feet downhill from the structure.

Trees and shrubs should be thinned so that there is at least a10-foot space between the crowns of the trees. Crown separation is measured from the furthest branch of one tree to the nearest branch on the tree immediately adjacent to it. On steep slopes, allow for more space between tree crowns. Remove all ladder fuels from under these remaining trees. Carefully prune trees to a height of 10 feet.

Because the purpose of Zone 2 is to also form an aesthetic buffer and provide for a transition between trees, it is necessary to blend the requirements for Zones 1 and 3. As a result, the inner portions of Zone 2 would be thinned more heavily than the outer portions. Gradually increase the tree density as the Zone 3 boundary is approached.

Isolated shrubs may remain, but ensure that they are not located under tree crowns. Prune and maintain these plants periodically in order to maintain vitality and vigorous growth. Remove the dead stems from trees and shrubs annually.

Limit the number of dead trees (snags) in this area. From a natural resource standpoint, wildlife needs only 1 to 2 snags per acre. Ensure that any wildlife trees that remain will not fall on structures or block routes of access and egress.

Mow, hay, graze or otherwise reduce the height of both warm and cool season grasses regularly, keeping them between 6 – 12 inches if possible (<3 inches is best). This is particularly true in the late summer and fall or during periods of drought when many of these grasses are cured and are at the peak of their flammability. Prescribed burning of the warm season grasses should be conducted during those times of the year when the particular species being treated benefit the most. Because prescribed burns are planned events, specific protection actions can be taken during these types of operations to ensure safety from unwanted ignitions.

Firewood and woodpiles should be stored uphill and away from structures, or if they must be stored on the same elevation as the structure, at least 30 feet away. A 10 foot space around these piles should be maintained free of any flammable vegetation. No wood should be stacked against a structure or under a deck, even in the winter.

Propane tanks should be located at least 30 feet away from structures, and always above the level of the structure. Clear away flammable vegetation from within 10 feet of these items. Do not screen propane tanks with flammable vegetation.

The disposal of slash (limbs, branches, and other woody debris) can be undertaken as a part of the Seashore fire management program and should only be undertaken according to the standards outlined in the appropriate section of the Fire Management Plan. Other methods of removal may be available such as chipping and removal, broadcast scattering, and/ or widely dispersed brush piles.

Zone 3 is an area of traditional forest management and is of no pre-set size. It should extend, however, from the edge of the defensible space to property boundaries. Typical management

objectives for these areas, as they relate to structural protection from wildland fire, are consistent with many of the management objectives of national parks. Forests in this zone are managed for the enhancement of the cultural scene, general forest aesthetics, recreation (trails and hiking), maintenance of ecosystem health as manifested in tree health and vigor, providing vegetation screens form the effects of development along the seashore boundary and the maintenance of viable habitat for wildlife of all kinds.

The main emphasis for management in Zone 3 is placed upon the reduction of excessive accumulations of dead and down forest fuels. Although these fuels are usually found at considerable distance from structures, during intense burning conditions, long range spotting can occur that presents a real threat to structures. These fuel accumulations usually occur as the result of activities such as insect infestations, wind and ice damage and the natural process of forest succession. The latter occurs most frequently in such species as Virginia, shortleaf, and loblolly pine and to a lesser extent in some of the hardwood species. Depending upon the amount and extent of fuel loading, a variety of methods may be used to reduce the accumulations present. Prescribed fire offers the most environmentally friendly alternative to hazardous fuel reduction, but other methods can be utilized as well. Among these are mechanical reduction, piling and burning, chipping, and lop-and-scatter. All of these techniques are discussed in detail in the ASIS Fire Management Plan.

Wildland Fire Prevention Analysis

The scope and content of the wildland fire prevention plan is based wholly upon the fire prevention analysis. The analysis is broken down into component parts, the sum of whom objectively details areas of concern and then identifies management actions necessary to meet the identified fire prevention activities for that portion of the seashore. Key elements of the plan include:

- **Determination of Risk**

  A risk is defined as any heat source or human activity that results in a wildland fire ignition. Risk at Assateague Island National Seashore generally falls into one of two major categories; natural or human-caused. Most of the historical ignitions at the seashore have been the result of human activity (i.e. escaped campfires, cigarettes, incendiary, etc.). Lightning makes up the remainder of the ignition sources that comprise the other-than-by-human-caused category. Risk is categorized as: **High, Moderate or Low.**

- **Determination of Hazards**

  Hazards are defined as the fuels and topography on which a wildland fire will spread. As was discussed earlier in this plan, an in-depth fuels survey and map have *not* been completed at ASIS, but interim fuels maps have been prepared and included in this fire management plan. These maps are based upon an analysis of general vegetation types found on the island. The effects of topography on fire behavior are minimal due to the

relatively flat terrain found on the island. Hazard is categorized as: **High, Moderate or Low.**

- **Determination of Values**

Values are defined as areas where loss from wildland fire would be deemed unacceptable. These values may include such categories as cultural resources, historic structures, archeological sites, inholdings, capital resources, developments, sensitive habitat, threatened and endangered species, watersheds, and adjacent land owners. Values are categorized as **High, Moderate, and Low.**

For the purposes of this prevention plan and analysis, Assateague Island National Seashore will be divided into four analysis units, hereafter referred to as **Fire Prevention Areas (FPA).** These FPA's are:

1. Headquarters/ Administration FPA
2. Central Visitor Use FPA
3. Backcountry FPA
4. Toms Cove Hook FPA

General Action Items

The following general action items have been identified as elements in the seashore's overall Fire Prevention Program. Many of the identified actions relate to issues that overlap between fire prevention areas (FPA) and therefore are presented in the following section. These items apply to ***all*** of the identified FPA's.

1. Fire Prevention messages are delivered by seashore staff at time of issuance of backcountry permits.

Responsibility:	*Target Date:*
All seashore staff issuing permits	On-going

2. Handouts and backcountry permits will be reviewed and revised if necessary, annually, to ensure that an adequate fire prevention message is included.

Responsibility:	*Target Date:*
Chief of Interpretation	March 1st annually

3. During periods of High Fire Danger (High, Very High, and Extreme), a prohibition against open fires, both wood and charcoal, will be posted at all entrance stations, permit issuing stations, visitor centers and campgrounds.

Responsibility:	*Target Date:*

District Rangers, all park staff Seashore Fire Coordinator	On-going

4. All trailheads will be posted with Special Fire Restrictions whenever they are placed in effect in accordance with the seashore's Step-up Plan.

Responsibility:	*Target Date:*
District Rangers	Whenever special fire restrictions are implemented.

5. Seasonal training will include fire prevention training and will place due emphasis on the need for fire prevention education and enforcement.

Responsibility:	*Target Date:*
Chief Ranger Seashore Fire Coordinator	June 1, annually

6. Education/ enforcement through normal backcountry patrols.

Responsibility:	*Target date:*
Chief Ranger and Staff	On-going

7. A fire prevention message will be developed to include as a part of static interpretive displays located at the seashore visitor centers and trailhead displays.

Responsibility:	*Target Date:*
Chief of Interpretation	June 1, annually

8. The Seashore Step-up Plan for Wildland Fire calls for increased fire prevention patrols, special restrictions and the broadcast of public service announcements during periods of High, Very High, and Extreme Fire Danger.

Responsibility:	*Target Date:*
Chief Ranger Seashore Fire Coordinator Chief of Interpretation	According to Step-Up Plan

Public Information Specialist

Current Situation

Assateague Island National Seashore has four Fire Prevention Areas (FPA) identified; three in Maryland and one in Virginia. Each requires some type of response regarding prevention activity that relate directly to the potential detrimental impacts of wildland fire.

Fire Prevention Area 1 (FPA1) – Headquarters and Administrative Complex

The central core of the ASIS Administrative site is made up of numerous structures, including the Barrier Island Visitor Center, an attached administration building, a maintenance facility, a wastewater treatment facility, and an employee housing area (6 employee houses). All of these structures are located on relatively level ground and are surrounded on all sides by mowed lawns. The maintenance compound itself is enclosed within a fence and is composed of structures that are of masonry construction with asphalt shingle roofing materials. The Visitor Center is also constructed of fire-resistant materials. The employee houses have wooden siding and asphalt shingles on the roofs. The entire housing area is surrounded by mowed lawn and adequate defensible space. Tidal marsh surrounds much of the periphery of the complex and makes up the majority of the zone 3 vegetation. Since this can potentially be a volatile fuel type, care should be taken to ensure that the present defensible space allocated to zone 2 is maintained in its present condition.

Hazard – Low
Value – High
Risk – Moderate

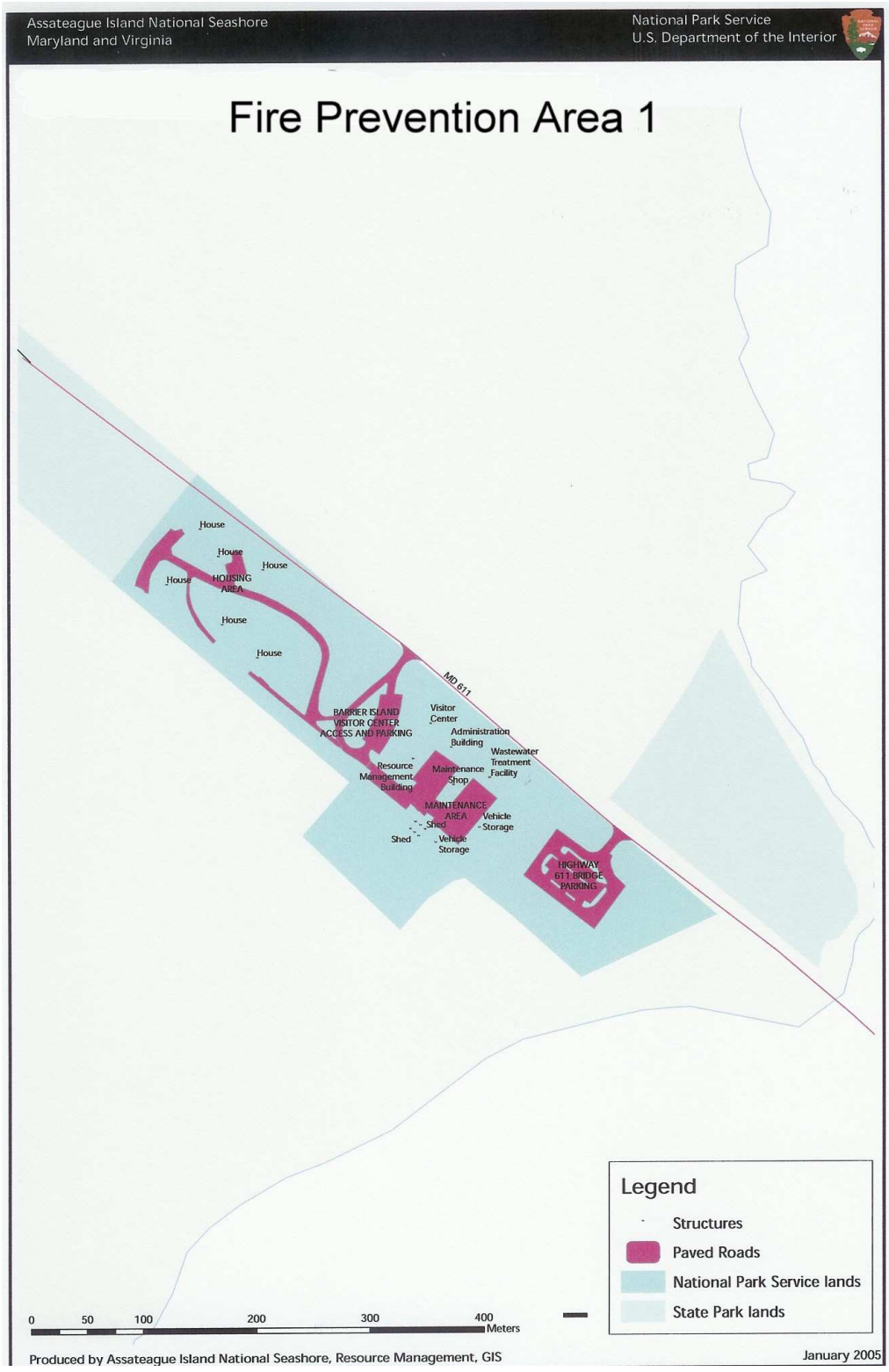
Specific Management Action(s):

Mowing of the grass surrounding structures in this FPA should continue. There is very small potential hazard from any direct flame impingement resulting from a wildland fire, and, as a result, fire will not present a direct threat to any of these structures ***under normal conditions***. During high wind conditions, wind driven ground-spotting embers can be transported up to .5 miles in fuel models such as those found adjacent to this FPA.

Access roads provide excellent vehicle entry to most of the structures discussed. These roads should be maintained to the extent necessary to allow emergency vehicle use in the event of a wildland fire.

Two local fire companies, Berlin and Ocean Pines VFD's are located a relatively short distance from the area and response times in the event of a wildland fire ignition appear to be excellent. A

water supply is also present for wildland fire suppression use. The seashore no longer has a wildland fire engine available for use in this area.



Fire Prevention Area 2 (FPA2) – Central Visitor-Use Area

The main visitor use area of the seashore begins at the Entrance Station located on the main paved access road (Bayberry Drive). Located almost immediately adjacent are the North Beach Parking Area, Bathhouse, 'bone yard" access, and Ranger Station. There is a scattering of brush, generally in the 2-4 foot range, surrounding much of the area. This is interdispersed with short grass, and at the present time does not represent a significant fuel problem. The main seashore road (Bayberry Drive), as well as several connected side-roads (i.e. Ferry Landing Road, Oceanside Drive and Bayside Campground and Picnic Area Road), provide ready access to a wide variety of seashore resources, i.e.; beach parking, campgrounds (Oceanside Campground, Group Campground, Drive-In Loops 1 and 2, Oceanside Walk-in Campground and the Bayside Campground and Picnic Area), interpretive exhibits access, Lifesaving Station Boathouse and History exhibits, the Canoe Rental Shack, and the Naturalist Shack. These roads also serve as valuable deterrent to potential fire spread by virtue of providing a non-flammable fuel break for much of the area.

Hazard – Moderate
Value – High
Risk – High

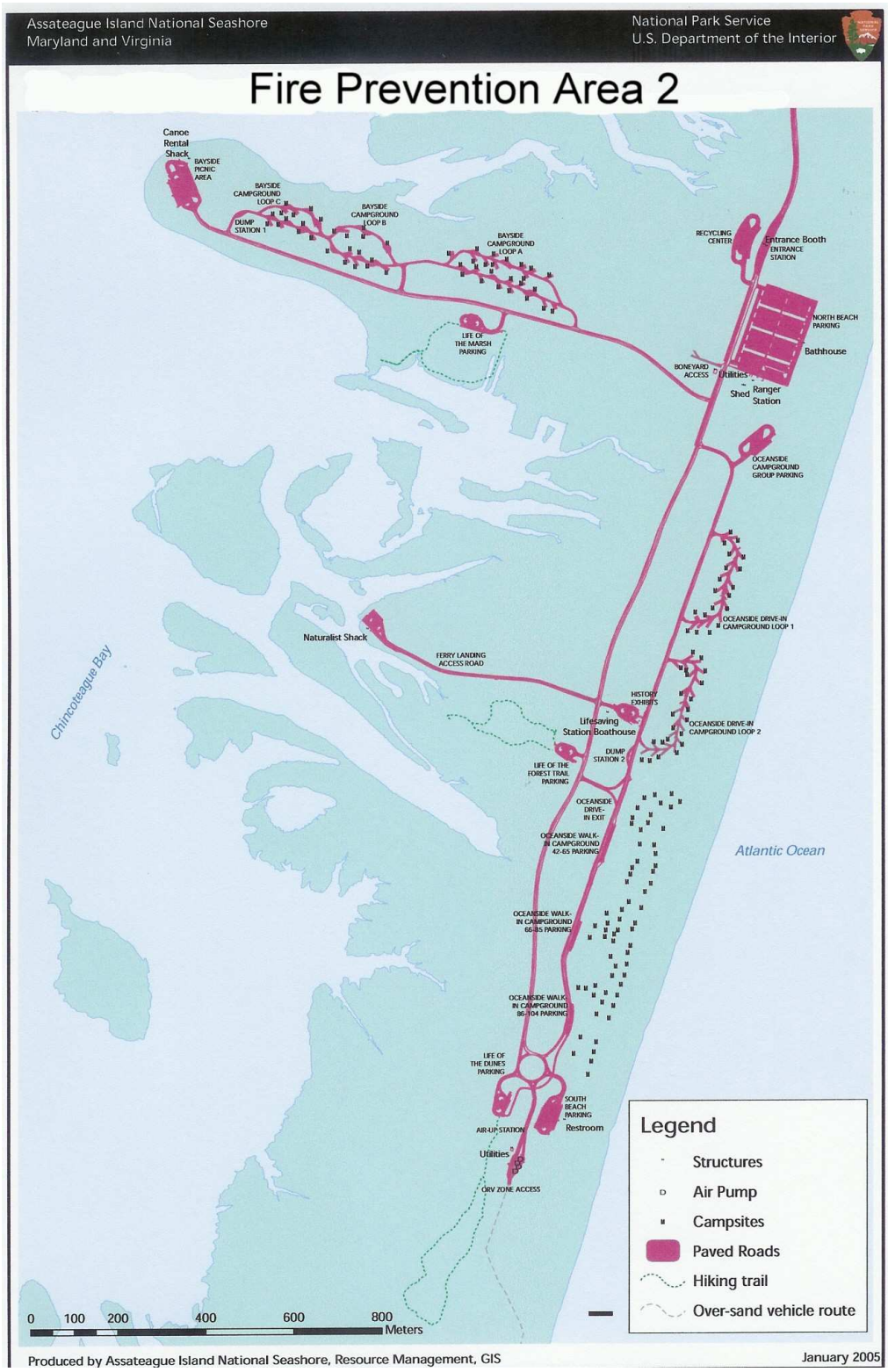
Specific Management Action(s):

1. Trailhead/Campground/ Picnic Areas contain fire prevention messages and any fire restrictions. Notification of restrictions given to cooperators and concession operators.

Responsibility:	*Target Date:*
Chief Ranger/ Chief Interpretation	May 1, annually
Implementation:	
Maryland District Ranger	Completed when fire restrictions in effect

2. Conduct special patrols of campgrounds/ picnic areas during periods of High and Extreme fire danger, especially when visitor use is heavy.

Implementation:	*Target Date*:
Maryland District Ranger	Ongoing


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Fire Prevention Area 2
Canoe Rental Shack
BAYSIDE PICNIC AREA
BAYSIDE CAMPGROUND LOOP C
DUMP STATION 1
BAYSIDE CAMPGROUND LOOP B
BAYSIDE CAMPGROUND LOOP A
LIFE OF THE MARSH PARKING
RECYCLING CENTER
Entrance Booth ENTRANCE STATION
NORTH BEACH PARKING
Bathhouse
BONEYARD ACCESS
Utilities
Shed
Ranger Station
OCEANSIDE CAMPGROUND GROUP PARKING
OCEANSIDE DRIVE-IN CAMPGROUND LOOP 1
Naturalist Shack
FERRY LANDING ACCESS ROAD
Chincoteague Bay
HISTORY EXHIBITS
Lifesaving Station Boathouse
OCEANSIDE DRIVE-IN CAMPGROUND LOOP 2
DUMP STATION 2
LIFE OF THE FOREST TRAIL PARKING
OCEANSIDE DRIVE-IN EXIT
OCEANSIDE WALK-IN CAMPGROUND 42-65 PARKING
Atlantic Ocean
OCEANSIDE WALK-IN CAMPGROUND 66-85 PARKING
OCEANSIDE WALK-IN CAMPGROUND 86-104 PARKING
LIFE OF THE DUNES PARKING
SOUTH BEACH PARKING
Restroom
AIR-UP STATION
Utilities
ORV ZONE ACCESS
Legend
Structures
Air Pump
Campsites
Paved Roads
Hiking trail
Over-sand vehicle route
0 100 200 400 600 800
Meters
Produced by Assateague Island National Seashore, Resource Management, GIS
January 2005

3. Mechanical reduction of fuels around the North Beach Life-Saving Station in accordance with the Cultural Landscape Report and Five Year Treatment Plan.

Responsibility:	*Target Date:*
Seashore Fire Coordinator Resource Management/ Cultural Resources	Ongoing

Evaluation and Monitoring of *all* structures in this FPA should take place to ensure that adequate defensive space is maintained between structures and fuels according to the guidelines discussed earlier in this plan.

Access roads provide excellent vehicle entry to most of the structures discussed. These roads should be maintained to the extent necessary to allow emergency vehicle use in the event of a wildland fire.

Two local fire companies, Berlin and Ocean Pines VFD's are located a relatively short distance from the area and response times in the event of a wildland fire ignition appear to be excellent.

Fire Prevention Area (FPA3) – Backcountry Area

The backcountry FPA begins at the terminus of the park hard surface road at South Ocean Beach and extends all the way south to the Virginia State Line. This includes some acreage of NPS land (four separate pieces totaling 236.2 acres) contained within the ASIS boundary located in Virginia on lands adjacent to the Chincoteague National Wildlife Refuge. This FPA contains four backpack/ canoe-in camping sites (Tingles, Pine Tree, Green Run and Pope Bay), two backpack camp sites (Little Levels and State Line), an ORV beach access corridor, and connecting trails that link the backcountry camping sites with the beach access. This FPA also contains eleven Hunting Lodge Retention Properties and a number of archeological and cultural sires that require a high level of protection from disturbance. Fuels in the FPA range from beach grass dominated dunes to areas of extensive marsh grass. Included in this FPA are many forested areas that are dominated by loblolly (*Pinus taeda*) pine and mixed hardwoods. Many of these forested areas contain a component of heavy brush that often exceeds 8 feet in height. Of the four FPA's found on Assateague Island National Seashore, this FPA represents the highest fuel hazard. Risks are classified as moderate; the majority of heavy visitor use risk is confined to areas in other portions of the seashore. The presence of the ORV access *does* provide ready access for a specialized user group, suggesting that this increase in human use creates a potential increase in risk as well. More importantly, past fire history suggests that the presence of backcountry campsites present an increased risk for wildland fire ignition, as a number of wildland fires have occurred in these areas. In addition, the presence of heavily forested areas creates potential for lightning strikes in areas populated by larger timber species.

Hazard – High
Value – Moderate to High
Risk – Moderate to High

Specific Management Action(s):

1. Trailhead notices and emergency telephone site located on South Beach contain fire prevention messages and fire restrictions (if applicable).

Responsibility:	*Target Date:*
Chief Ranger/ Chief Interpretation	May 1, annually
Implementation:	
Maryland District Ranger	Completed when fire restrictions in effect

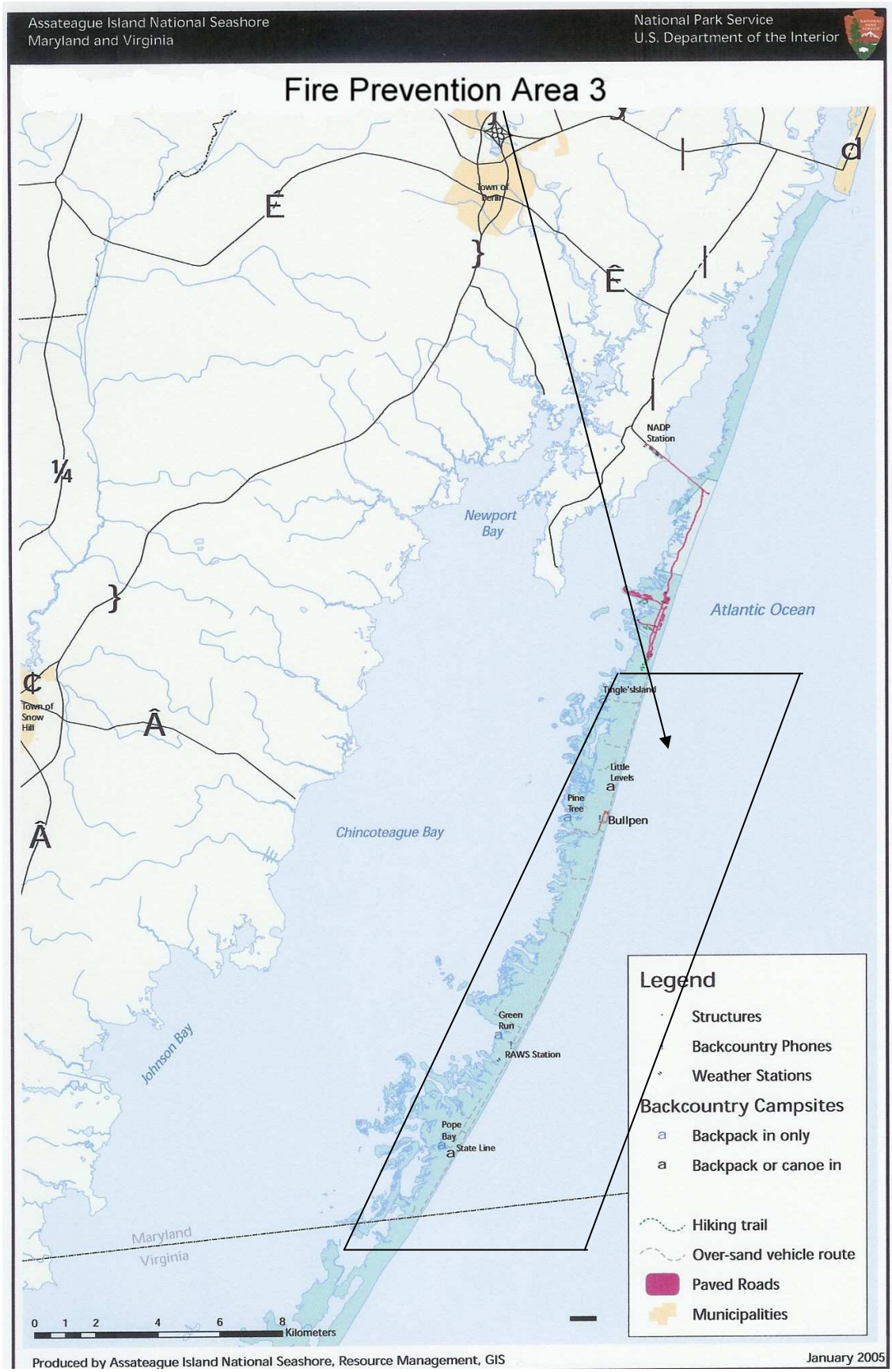
2. Conduct special patrols of the backcountry and ORV Access areas during periods of High, Very High and Extreme fire danger, especially when visitor use is heavy (i.e. during hunting season).

Implementation:	*Target Date*:
Maryland District Ranger	Ongoing

3. Mechanical reduction of fuels around the High Winds and Peoples-Lynch Hunting Lodge Retention Properties in accordance with the Cultural Landscape Report and Five Year Treatment Plan found in the Fire Management Plan. Prescribed fire hazardous fuel treatment of Hungerfords and Jackson-Green Run Hunting Lodge Retention Properties as per Cultural Landscape Report and the Five Year Treatment Plan found in the Fire Management Plan.

Responsibility:	*Target Date:*
Seashore Fire Coordinator Resource Management/ Cultural Resources	Ongoing

4. Evaluation and monitoring of the remaining seven Hunting Lodge Retention Properties (Buntings, Valentines, Bob O'Del Hunt Club, Clemets Boat House, Clemets beach House, Mussers, and the Black Duck – Pope Island Gun Club) as a means to ensure appropriate defensive space protection as described in the first section of this Prevention Analysis and Plan. Additionally, attention should be paid to archeological and cultural sites that need protection from the threat of wildland fire.


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Fire Prevention Area 3
Town of Berlin
NADP Station
Newport Bay
Atlantic Ocean
Tingle'sIsland
Town of Snow Hill
Little Levels
Pine Tree
Bullpen
Chincoteague Bay
Green Run
RAWS Station
Johnson Bay
Pope Bay
State Line
Maryland
Virginia
0 1 2 4 6 8
Kilometers
Legend
Structures
Backcountry Phones
Weather Stations
Backcountry Campsites
Backpack in only
Backpack or canoe in
Hiking trail
Over-sand vehicle route
Paved Roads
Municipalities
Produced by Assateague Island National Seashore, Resource Management, GIS
January 2005

. *Responsibility:*	*Target Date:*
Seashore Fire Coordinator Resource Management/ Cultural Resources	Ongoing

Access roads provide vehicle entry to most of the structures discussed. These roads should be maintained to the extent necessary to allow emergency vehicle use in the event of a wildland fire. This likely would involve periodic brush trimming and removal, done in conjunction with item #4 above.

Fire Prevention Area (FPA4) – Toms Cove Hook Area (Virginia District)

The National Park Service, through a Memorandum of Agreement with the U.S. Fish and Wildlife Service, operates a visitor recreation program on the Toms Cove Hook portion of Assateague Island. The National Park Service owns approximately 9.4 acres of land contained within the Toms Cove Hook area and manages the remaining acreage under the agreement described previously. The National Park Service maintains on Toms Cove Hook a visitor center, lifeguard-protected swimming beach, restrooms, amphitheater, parking areas and picnic sites. The majority of the land base is managed as a part of the old Assateague Beach Coast Guard Station and associated structures, all of which are on the National Register of Historic Places. The Toms Cove Hook area is almost completely surrounded by water with the exception of a narrow strip of beach that connects it to the main portion of the island. Within this FPA the potential for human caused ignition is minimal due to the restrictions imposed upon the visiting public by both the USFWS and the NPS. The vegetation is dominated by sparse and isolated patches of grass on the dunes and brush found mostly adjacent to fresh water ponds. According to U.S. Fish and Wildlife Service records, there is no recorded history of a fire ever having occurred in the FPA.

Hazard – Low
Value – High
Risk – Low

Specific Management Action(s):

1. Fire prevention messages and any fire restrictions posted at both the NPS and USFWS Visitor Centers and at access points to visitor use areas. Coordinate closely with the U.S. Fish and Wildlife Service in fire prevention planning and information dissemination.

Responsibility:	*Target Date:*
Chief Ranger/ Chief Interpretation	May 1, annually

Implementation:

Virginia District Ranger	Completed when fire restrictions in effect

2. Conduct special patrols of visitor-use and picnic areas during periods of High and Extreme fire danger, especially when use is heavy.

Implementation:	*Target Date*:
Virginia District Ranger	Ongoing

3. Mechanical reduction of fuels around the Assateague Beach Coast Guard Station in accordance with the Cultural Landscape Report.

Responsibility:	*Target Date:*
Seashore Fire Coordinator Resource Management/ Cultural Resources	Ongoing

Evaluation and Monitoring of all structures in this FPA should take place to ensure that adequate defensive space is maintained between fuels.

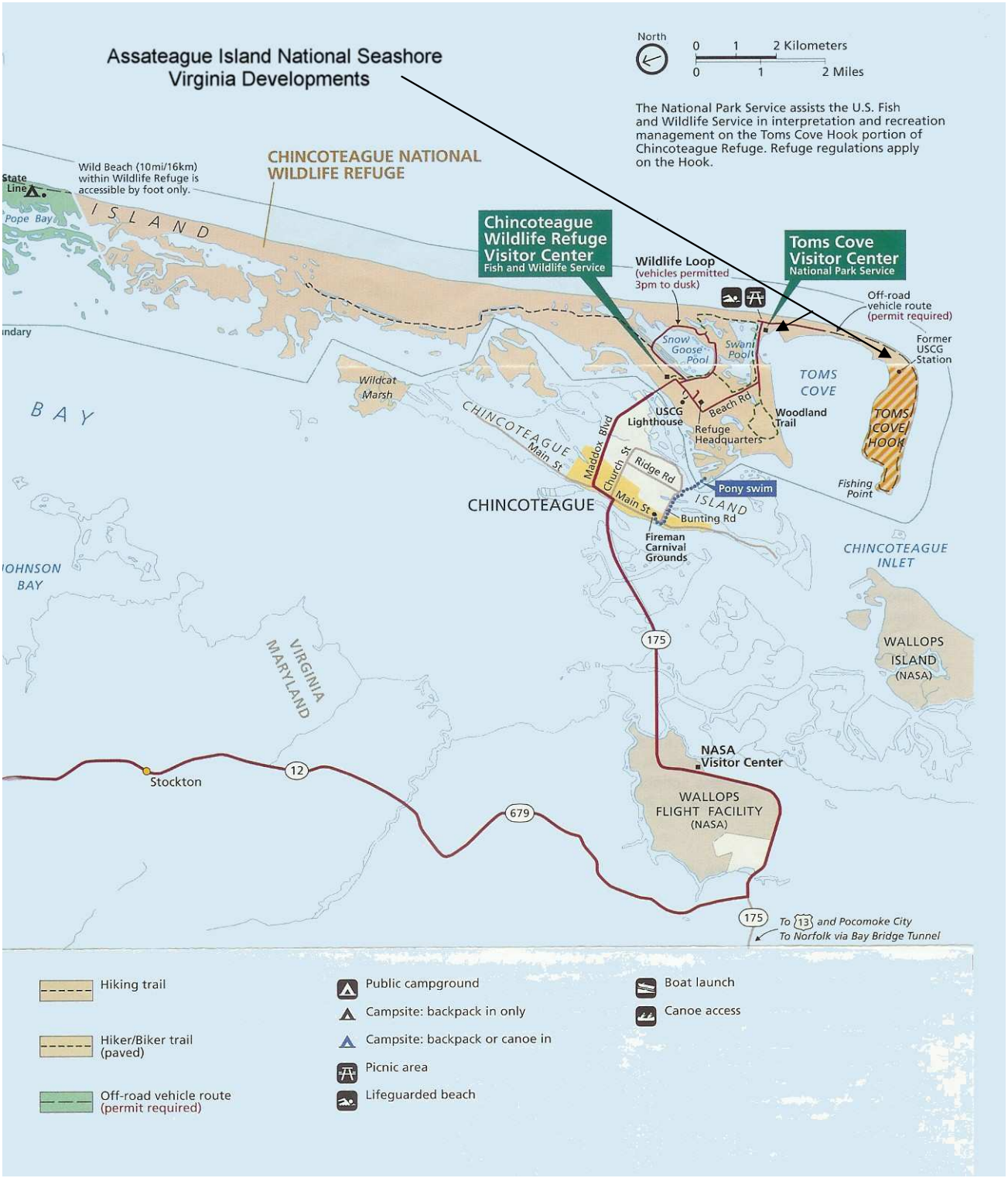
Access roads provide excellent vehicle entry to most of the structures discussed. These roads should be maintained to the extent necessary to allow emergency vehicle use in the event of a wildland fire.

A local fire company, the Chincoteague Volunteer Fire Company, is located a relatively short distance from the FPA and response times in the event of a wildland fire ignition appear to be excellent. At the present time there is no written agreement in place with this organization.

4. Develop a written agreement for wildland (and structural) fire protection) with the Chincoteague Volunteer Fire Company as soon as practicable.

Responsibility:	*Target Date:*
Chief Ranger Seashore Fire Coordinator	Ongoing

Assateague Island National Seashore FPA4



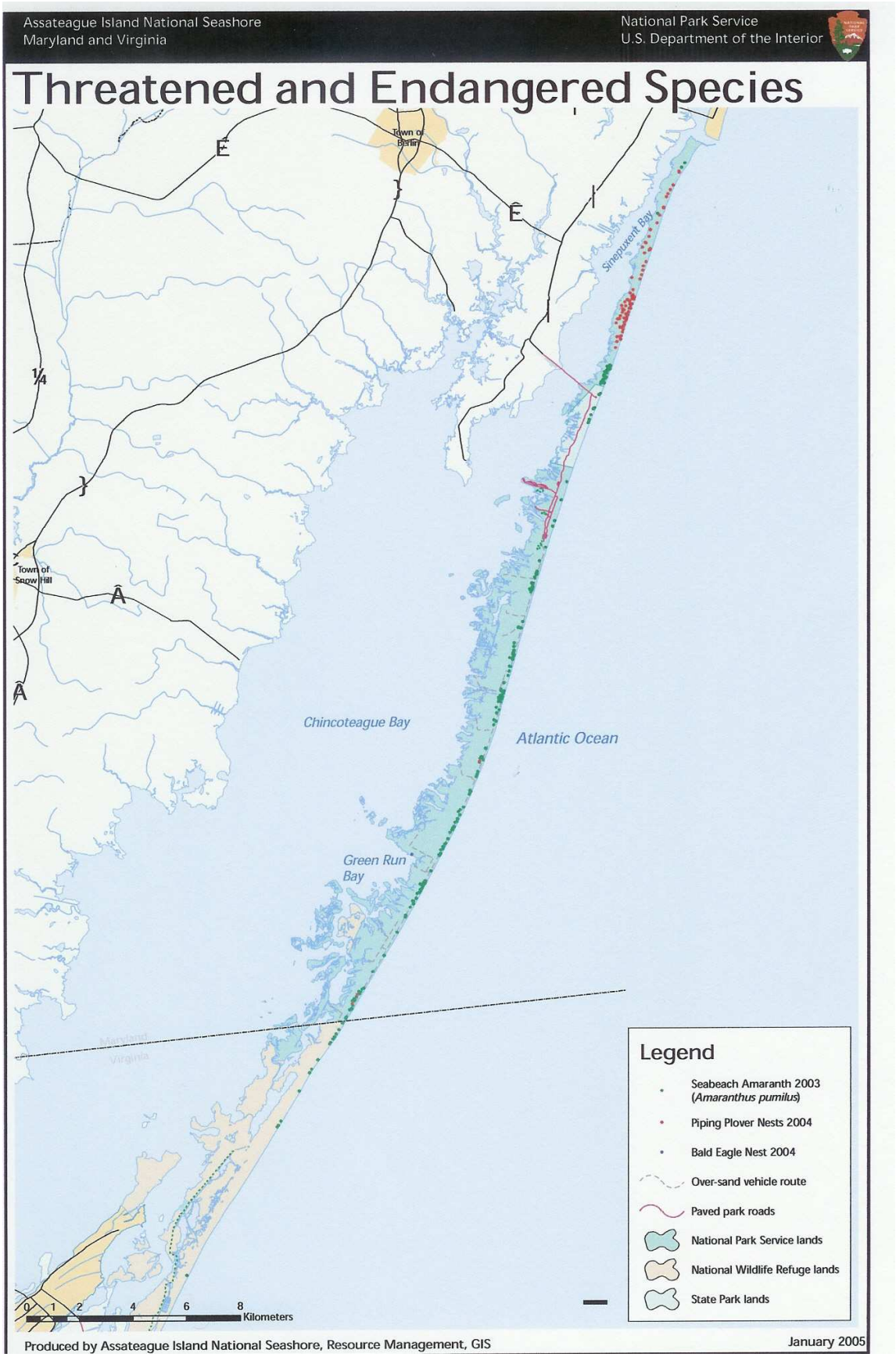
Conclusion

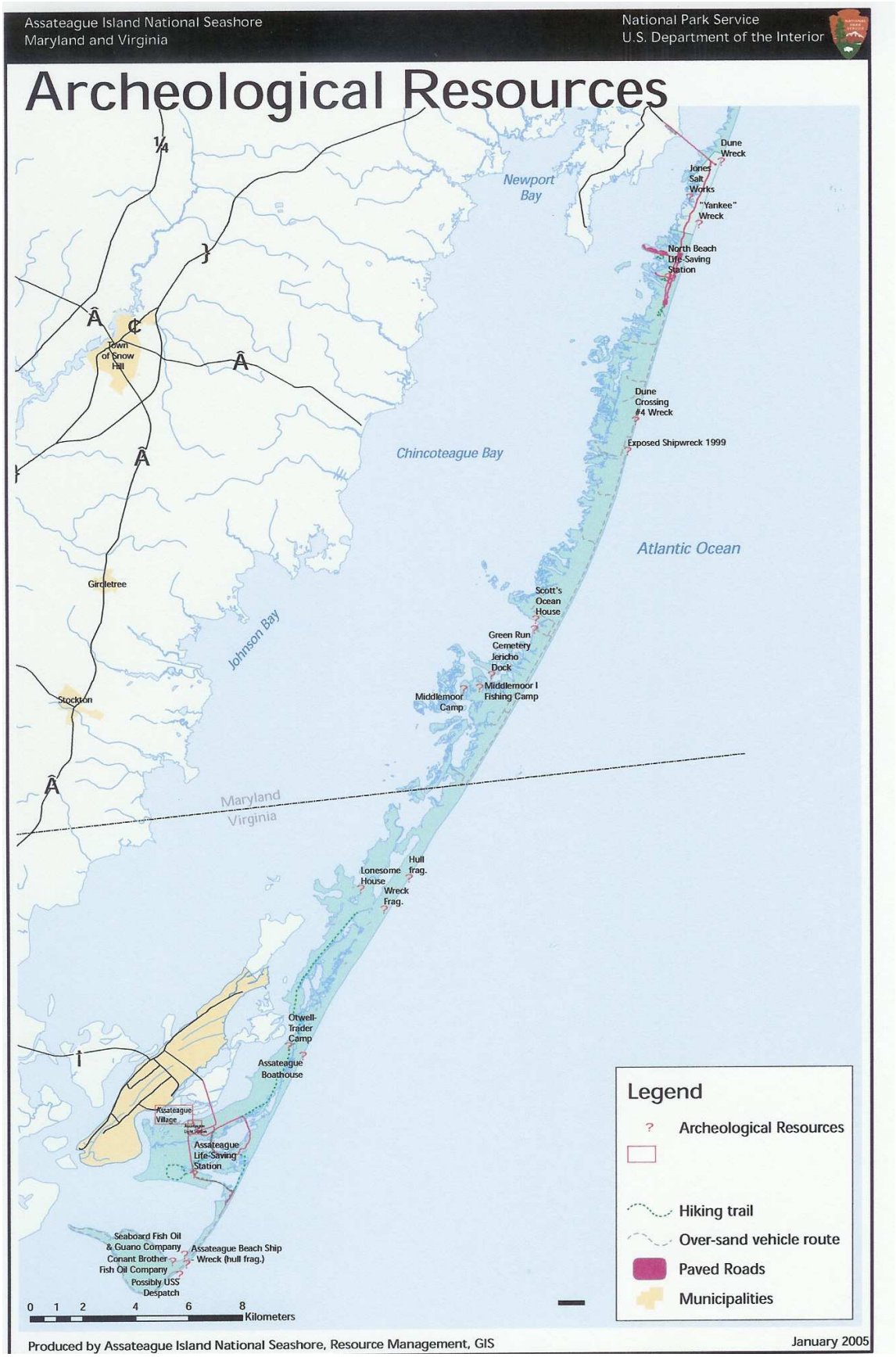
Seashore structures, both historic and those that are presently functional in everyday seashore operation, are, in general, well protected from the effects of a wildland fire. The possible exception would occur when a wildland fire, being driven by the most extreme of environmental conditions, were to take place. Even under these extreme conditions only a very few structures would be considered at risk. Historically these events are quite rare in this area. Of concern is the fact that there are some areas of the seashore where forest fuels and associated understory vegetation (i.e. brush) have accumulated to excessive levels, largely as the result of uninterrupted vegetation succession, insect and storm damage. These areas should be treated in a prioritized fashion as discussed in the Fire Management Plan (Five Year Plan) in order to prevent increased hazard to seashore resources. A trail and road system provides reasonably good access to most of the cultural resources found at the seashore. These systems should be maintained to the degree necessary to provide the protection the cultural sites require. The key to the protection of ASIS resources lies with the continued development of effective working agreements between the seashore, the USFWS, Assateague State Park and fire departments in the area. Included in these agreements should be the development and propagation of cooperative training and exchange of information resources. The accurate and timely exchange of seashore resource maps clearly showing values at risk, will greatly speed response times in the event of wildland fire. This will also help ensure that valuable cultural resources are not damaged by the suppression effort during wildland fires.

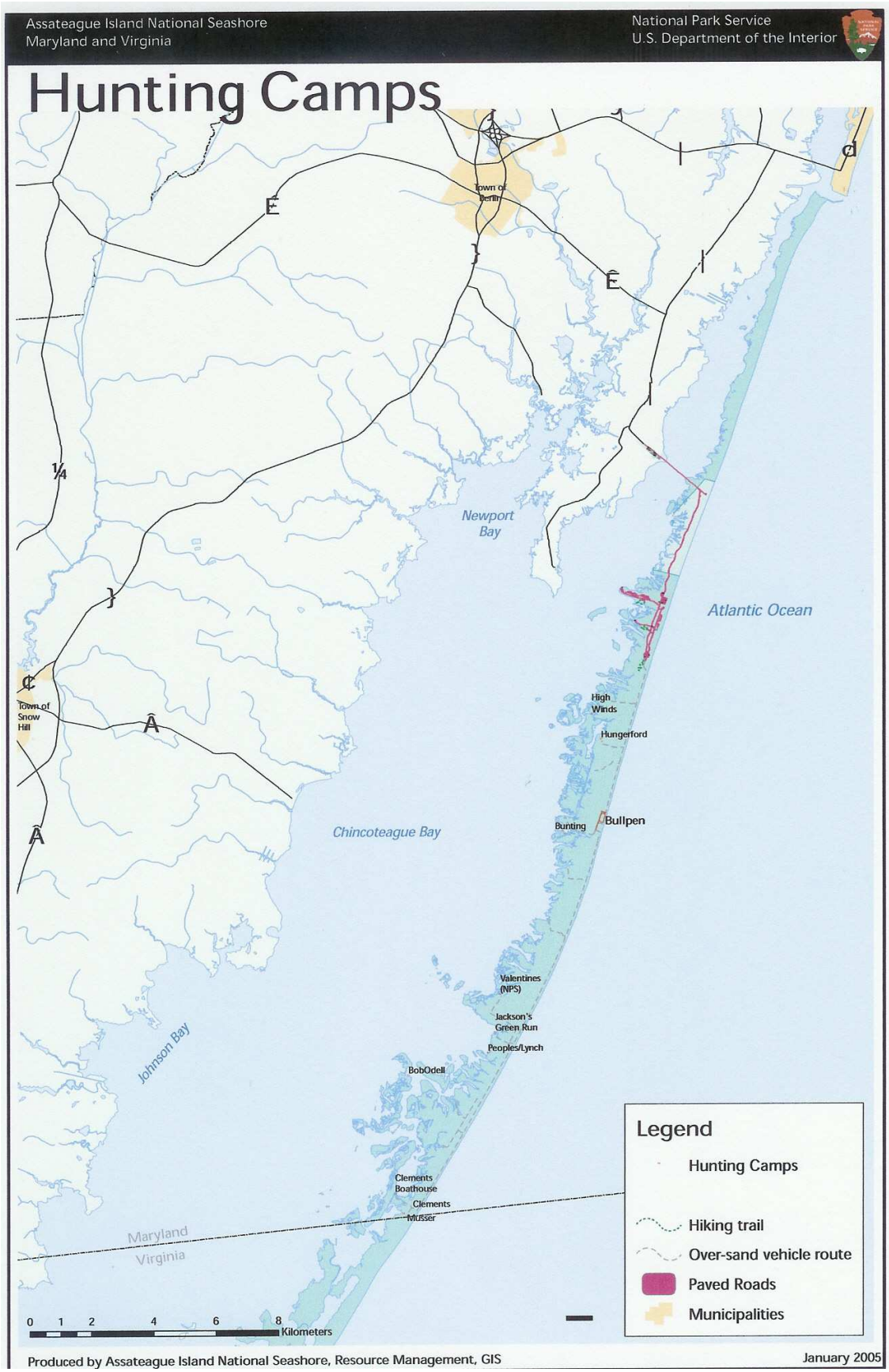
APPENDIX V

Maps of Sensitive Natural and Cultural Resources

(May be omitted at the discretion of ASIS staff for security reasons)


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Threatened and Endangered Species
Town of Berlin
Town of Snow Hill
Sinepuxent Bay
Chincoteague Bay
Atlantic Ocean
Green Run Bay
Maryland
Virginia
Legend
Seabeach Amaranth 2003 (Amaranthus pumilus)
Piping Plover Nests 2004
Bald Eagle Nest 2004
Over-sand vehicle route
Paved park roads
National Park Service lands
National Wildlife Refuge lands
State Park lands
0 1 2 4 6 8
Kilometers
Produced by Assateague Island National Seashore, Resource Management, GIS
January 2005


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Archeological Resources
Newport Bay
Chincoteague Bay
Johnson Bay
Atlantic Ocean
Maryland
Virginia
Town of Snow Hill
Girdletree
Stockton
Dune Wreck
Jones Salt Works
"Yankee" Wreck
North Beach Life-Saving Station
Dune Crossing #4 Wreck
Exposed Shipwreck 1999
Scott's Ocean House
Green Run Cemetery
Jericho Dock
Middlemoor Camp
Middlemoor I Fishing Camp
Lonesome House Wreck Frag.
Hull frag.
Otwell-Trader Camp
Assateague Boathouse
Assateague Village
Assateague Life-Saving Station
Seaboard Fish Oil & Guano Company
Conant Brother Fish Oil Company
Possibly USS Despatch
Assateague Beach Ship Wreck (hull frag.)
0 1 2 4 6 8
Kilometers
Legend
Archeological Resources
Hiking trail
Over-sand vehicle route
Paved Roads
Municipalities
Produced by Assateague Island National Seashore, Resource Management, GIS
January 2005


Assateague Island National Seashore
Maryland and Virginia
National Park Service
U.S. Department of the Interior
Hunting Camps
Town of Berlin
Newport Bay
Atlantic Ocean
Town of Snow Hill
High Winds
Hungerford
Bunting
Bullpen
Chincoteague Bay
Valentines (NPS)
Jackson's Green Run
Peoples/Lynch
BobOdell
Johnson Bay
Clements Boathouse
Clements Musser
Maryland
Virginia
0 1 2 4 6 8
Kilometers
Legend
Hunting Camps
Hiking trail
Over-sand vehicle route
Paved Roads
Municipalities
Produced by Assateague Island National Seashore, Resource Management, GIS
January 2005

APPENDIX W

GLOSSARY

APPENDIX W
National Fire Plan
Glossary of Wildland Fire Terms

A

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

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

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, or county government organization participating with jurisdictional responsibilities.

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

Aramid: The generic name for a high-strength, flame-resistant synthetic fabric used in the shirts and jeans of firefighters. Nomex, a brand name for aramid fabric, is the term commonly used by firefighters.

Aspect: Direction toward which a slope faces.

B

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

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

Bambi Bucket: A collapsible bucket slung below a helicopter. Used to dip water from a variety of sources for fire suppression.

Behave: A system of interactive computer programs for modeling fuel and fire behavior that consists of two systems: BURN and FUEL.

Bladder Bag: A collapsible backpack portable sprayer made of neoprene or high-strength nylon fabric fitted with a pump. (See also Backpack Pump.)

Blow-up: A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm. (See Flare-up.)

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

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush, and scrub growth.

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

Buffer: An area of natural or established vegetation managed in such a manner so as to protect other components of the ecosystem. Commonly used in conjunction with the protection of riparian resources that are especially vulnerable to the effects of erosion.

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

Bump-up Method: A progressive method of building a fire line on a wildfire without changing relative positions in the line. Work is begun with a suitable space between workers. Whenever one worker overtakes another, all workers ahead move one space forward and resume work on the uncompleted part of the line. The last worker does not move ahead until completing his or her space.

Burn Out: Setting fire inside a control line to widen it or consume fuel between the edge of the fire and the control line.

Burning Ban: A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

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

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

C

Campfire: As used to classify the cause of a wildland fire, a fire that was started for cooking or warming that spreads sufficiently from its source to require action by a fire control agency.

Candle or Candling: A single tree or a very small clump of trees that is burning from the bottom up.

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

Chesapeake Bay Preservation Area (CBPA): As directed by the Chesapeake Bay Preservation Act of 1988; those communities that border on tidal portions of rivers that drain into the Chesapeake Bay are required to institute water quality protection measures aiming at improving the declining health of the Chesapeake Bay and its tributaries. In accordance with the regulations enacted by the CBPA, Resource Management Areas (RPA), Resource Protection Areas (RPA) and Intensely Developed Areas (IDA) were designated within the lands covered by the CBPA.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

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

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

Command Staff: The command staff consists of the information officer, safety officer, and liaison officer. They report directly to the incident commander and may have assistants.

Complex: Two or more individual incidents located in the same general area, which are assigned to a single incident commander or unified command.

Contain a fire: A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

Control a fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

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

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, telephone company, etc.

Coyote Tactics: A progressive line construction duty involving self-sufficient crews that build fire line until the end of the operational period, remain at or near the point while off duty, and begin building fire line again the next operational period where they left off.

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

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

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

Curing: Drying and browning of herbaceous vegetation or slash.

D

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

Debris Burning: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

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

Deployment: See Fire Shelter Deployment.

Detection: The act or system of discovering and locating fires.

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

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

Dispatcher: A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for control in first attack, and sends them to the proper place.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Division: Divisions are used to divide an incident into geographical areas of operation. Divisions are established when the number of resources exceeds the span-of-control of the operations chief. A division is located with the Incident Command System organization between the branch and the task force/strike team.

Dozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line: Fire line constructed by the front blade of a dozer.

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

Drop Zone: Target area for air tankers, helitankers, and cargo dropping.

Drought Index: A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

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

E

Energy Release Component (ERC): The computed total heat released per unit area (British thermal units per square foot) within the fire front at the head of a moving fire.

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

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

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include "near misses."

Environmental Assessment (EA): EAs were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis, and an array of action alternatives allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Equilibrium Moisture Content: Moisture content that a fuel particle will attain if exposed for an infinite period in an environment of specified constant temperature and humidity. When a fuel particle reaches equilibrium moisture content, net exchange of moisture between it and the environment is zero.

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

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

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

Extreme Fire Behavior: "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One of more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, and strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

F

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

Field Observer: Person responsible to the Situation Unit Leader for collecting and reporting information about an incident obtained from personal observations and interviews.

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

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

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

Fire Behavior Forecast: Prediction of probable fire behavior, usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

Fire Behavior Specialist: A person responsible to the Planning Section Chief for establishing a weather data collection system and for developing fire behavior predictions based on fire history, fuel, weather, and topography.

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

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

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

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

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

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

Fire Load: The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

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

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

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

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

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

Fire Storm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface in drafts, near and beyond the perimeter, and sometimes by tornado-like whirls.

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

Fire Use Module (Prescribed Fire Module): A team of skilled and mobile personnel dedicated primarily to prescribed fire management. These are national and interagency resources, available throughout the prescribed fire season, that can ignite, hold, and monitor prescribed fires.

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

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

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

Firefighting Resources: All people and major items of equipment that can or potentially could be assigned to fires.

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

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

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

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

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forb: A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

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

Fuel Bed: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

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

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

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

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

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

Fusee: A colored flare designed as a railway warning device and widely used to ignite suppression and prescription fires.

G

General Staff: The group of incident management personnel reporting to the incident commander. They may each have a deputy, as needed. Staff consists of operations section chief, planning section chief, logistics section chief, and finance/administration section chief.

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in coordination and effective utilization.

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

H

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fireline built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head of a Fire: The side of the fire having the fastest rate of spread.

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

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually located at or near the incident base.

Helispot: A temporary landing spot for helicopters.

Helitack: The use of helicopters to transport crews, equipment, and fire retardants or suppressants to the fire line during the initial stages of a fire.

Helitack Crew: A group of firefighters trained in the technical and logistical use of helicopters for fire suppression.

Holding Actions: Planned actions required to achieve wildland prescribed fire management objectives. These actions have specific implementation timeframes for fire use actions but can have less sensitive implementation demands for suppression actions.

Holding Resources: Firefighting personnel and equipment assigned to do all required fire suppression work following fireline construction but generally not including extensive mop-up.

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

Hotshot Crew: A highly trained fire crew used mainly to build fireline by hand.

Hotspot: A particular active part of a fire.

Hotspotting: Reducing or stopping the spread of fire at points of particularly rapid rate of spread or special threat, generally the first step in prompt control, with emphasis on first priorities.

I

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources.

Incident Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Command Post (ICP): Location at which primary command functions are executed. The ICP may be co-located with the incident base or other incident facilities.

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure,

with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

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

Incident Management Team: The incident commander and appropriate general or command staff personnel assigned to manage an incident.

Incident Objectives: Statements of guidance and direction necessary for selection of appropriate strategy, and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

Infrared Detection: The use of heat sensing equipment, known as Infrared Scanners, for detection of heat sources that are not visually detectable by the normal surveillance methods of either ground or air patrols.

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

J

Job Hazard Analysis: This analysis of a project is completed by staff to identify hazards to employees and the public. It identifies hazards, corrective actions, and the required safety equipment to ensure public and employee safety.

Jump Spot: Selected landing area for smokejumpers.

Jump Suit: Approved protection suit worn by smokejumpers.

K

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

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

L

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

Large Fire: 1) For statistical purposes, a fire burning more than a specified area of land e.g., 300 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Lead Plane: Aircraft with pilot used to make dry runs over the target area to check wind and smoke conditions, topography, and to lead air tankers to targets and supervise their drops.

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

Lightning Activity Level (LAL): A number, on a scale of 1 to 6, which reflects frequency and character of cloud-to-ground lightning. The scale is exponential, based on powers of 2 (i.e., LAL 3 indicates twice the lightning of LAL 2).

Line Scout: A firefighter who determines the location of a fire line.

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

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

M

Micro-Remote Environmental Monitoring System (Micro-REMS): Mobile weather monitoring station. A Micro-REMS usually accompanies an incident meteorologist and ATMU to an incident.

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

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Modular Airborne Firefighting System (MAFFS): A manufactured unit consisting of five interconnecting tanks, a control pallet, and a nozzle pallet, with a capacity of 3,000 gallons, designed to be rapidly mounted inside an unmodified C-130 (Hercules) cargo aircraft for use in dropping retardant on wildland fires.

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

Multi-Agency Coordination (MAC): A generalized term which describes the functions and activities of representatives of involved agencies and/or jurisdictions who come together to make decisions regarding the prioritizing of incidents, and the sharing and use of critical resources. The MAC organization is not a part of the on-scene ICS and is not involved in developing incident strategy or tactics.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

N

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions.

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

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

Natural and/ or Cultural Resource Professional: The appointed staff professional from within a park unit that has the designated responsibility to oversee either natural or cultural resources, or both. This is usually a collateral duty assignment in a park that has limited staffing.

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

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

O

Operations Branch Director: Person under the direction of the operations section chief who is responsible for implementing that portion of the incident action plan appropriate to the branch.

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

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

P

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

Paracargo: Anything dropped, or intended for dropping, from an aircraft by parachute, by other retarding devices, or by free fall.

Peak Fire Season: That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.

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

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

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the prescribed burn boss information needed to implement an individual prescribed fire project.

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

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

Project Fire: A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

Pulaski: A combination chopping and trenching tool, which combines a single-bitted axe-blade with a narrow adze-like trenching blade fitted to a straight handle. Useful for grubbing or trenching in duff and matted roots. Well-balanced for chopping.

R

Radiant Burn: A burn received from a radiant heat source.

Radiant Heat Flux: The amount of heat flowing through a given area in a given time, usually expressed as calories/square centimeter/second.

Rappelling: Technique of landing specifically trained firefighters from hovering helicopters; involves sliding down ropes with the aid of friction-producing devices.

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

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

Red Card: Fire qualification card issued to fire rated persons showing their training needs and their qualifications to fill specified fire suppression and support positions in a large fire suppression or incident organization.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

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

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

Remote Automatic Weather Station (RAWS): An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.

Resources: 1) Personnel, equipment, services, and supplies available, or potentially available, for assignment to incidents. 2) The natural resources of an area, such as timber, crass, watershed values, recreation values, and wildlife habitat.

Resource Management Area (RMA): A designation of the Chesapeake Bay Preservation Area (CBPA) that is used to designate those lands contiguous to the inland boundary of the Resource Protection Area (RPA) which has the potential for degrading water quality or otherwise diminishing the value of the RPA if not properly managed. The RMA is delineated on maps and includes steep slopes, highly permeable soils, and non-tidal wetlands not included in the RPA.

Resource Protection Area (RPA): That component of the Chesapeake Bay Preservation Area (CBPA) comprised of lands adjacent to water bodies with perennial flow that have an intrinsic water quality value due to the ecological and biological processes they perform or are sensitive to impacts which may result in significant degradation to the water quality of riparian resources critical to the overall health and

sustainability of the watershed. The RPA is designated on maps as a 100 foot buffer zone around designated features.

Resource Management Plan (RMP): A document prepared by field office staff with public participation, and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Resource Order: An order placed for firefighting or support resources.

Retardant: A substance or chemical agent that reduces the flammability of combustibles.

Run (of a fire): The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

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

S

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

Scratch Line: An unfinished preliminary fire line hastily established or built as an emergency measure to check the spread of fire.

Severity Funding: Funds provided to increase wildland fire suppression response capability necessitated by abnormal weather patterns, extended drought, or other events causing abnormal increase in the fire potential and/or danger.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

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

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

Sling Load: Any cargo carried beneath a helicopter and attached by a lead line and swivel.

Slop-over: A fire edge that crosses a control line or natural barrier intended to contain the fire.

Smokejumper: A firefighter who travels to fires by aircraft and parachute.

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

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

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

Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

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

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

Spotter: In smokejumping, the person responsible for selecting drop targets and supervising all aspects of dropping smokejumpers.

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

Staging Area: Locations set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the operations section.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Streamside Management Zone (SMZ): Land and vegetation areas located next to lakes and streams where management practices are modified in order to protect water quality, fish, and other aquatic resources. Because SMZ's are located next to water, they assist in the prevention of non-point source pollution to surface waters. Most SMZ's at COLO are designated on maps as being 50 foot buffer zones.

Strike Team: Specified combinations of the same kind and type of resources, with common communications, and a leader.

Strike Team Leader: Person responsible to a division/group supervisor for performing tactical assignments given to the strike team.

Structure Fire: Fire originating in and burning any part or all of any building, shelter, or other structure.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

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

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

Swamper: (1) A worker who assists fallers and/or sawyers by clearing away brush, limbs and small trees. Carries fuel, oil, and tools, and watches for dangerous situations. (2) A worker on a dozer crew who pulls winch line, helps maintain equipment, etc., to speed suppression work on a fire.

T

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

Temporary Flight Restrictions (TFR): A restriction requested by an agency and put into effect by the Federal Aviation Administration in the vicinity of an incident, which restricts the operation of nonessential aircraft in the airspace around that incident.

Terra Torch ®: Device for throwing a stream of flaming liquid, used to facilitate rapid ignition during burn out operations on a wildland fire or during a prescribed fire operation.

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

Timelag: Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

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

Two-way Radio: Radio equipment with transmitters in mobile units on the same frequency as the base station, permitting conversation in two directions using the same frequency in turn.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

U

Uncontrolled Fire: Any fire that threatens to destroy life, property, or natural resources.

Underburn: A fire that consumes surface fuels but not trees or shrubs. (See Surface Fuels.)

V

Vectors: Directions of fire spread as related to rate of spread calculations (in degrees from upslope).

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

W

Watershed Management Plan: In accordance with the objectives of the comprehensive plan for water quality protection, the Watershed Management Plan

(WMP) identifies those areas that surround current or potential public water supply reservoirs (200 ft). The establishment of the regulations was intended to prevent the causes of degradation of the water supply resvoir as the result of the operation or accidental malfunctioning of the use of the land or its appurtenances within the drainage area of such water sources.

Water Tender: A ground vehicle capable of transporting specified quantities of water.

Weather Information and Management System (WIMS): An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource management agencies. Provides timely access to weather forecasts, current and historical weather data, the National Fire Danger Rating System (NFDRS), and the National Interagency Fire Management Integrated Database (NIFMID).

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

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

Wildland Fire Implementation Plan (WFIP): A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. This document provides a record of decisions.

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

Wildland Urban Interface: The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Wind Vectors: Wind directions used to calculate fire behavior.

APPENDIX X

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APPENDIX X

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APPENDIX Y

State of Virginia Prescribed Fire Fact Sheet

FACT SHEET
PRESCRIBED FIRE AND THE VIRGINIA 4:00 PM BURNING LAW

- The Virginia Department of Forestry (VDOF), United States Forest Service (USFS), National Park Service (NPS), and United States Fish and Wildlife Service (FWS) all have wildland fire management responsibilities, and all cooperate in wildfire suppression, prevention, and prescribed fire programs. While the overall missions of the four agencies are similar in respect to wildland fire, there are some differences as well.

- Virginia Code Section 10.1-1142 B, known as the"4 PM Burning Law", comes into effect each spring, which is when the state generally experiences its highest fire dangers. In brief the 4 PM Burning Law prohibits burning before 4:00 PM, from February 15 through April 30 of each year, within 300 feet of woodland, brush land or fields containing dry grass or other flammable material.

- The 4 PM Burning Law specifically exempts burning conducted on federal lands. While it may initially appear otherwise, prescribed burning by the federal wildland fire agencies is not in conflict with the intent of the 4 PM Burning Law.

- The 4 PM Burning Law is intended to prevent wildfires originating from escaped trash and debris fires. These types of fires are often conducted by individuals not making proper precautions, and often on days when high fire danger exists. Escaped trash and debris fires account for one-third of Virginia's wildfires.

- Federal natural resources agencies are mandated to implement prescribed fire on their lands in a manner that is consistent with their respective agency policies. In order to meet specified objectives, prescribed burns must be conducted only when weather, fuel, soil, and smoke dispersal conditions are within pre-determined parameters. These parameters are used to develop a "prescription" for the burn. This 'prescription" identifies the conditions that allow the burn to meet the management objectives without jeopardizing the safety of the land and people nearby.

- The period of time when these prescription parameters can be met are often extremely limited. The objectives of most federal burns are for ecological purposes such as vegetation and wildlife habitat improvement, and prescription requirements can usually only be met in the spring during the time period covered by the 4 PM Burning Law.

- VDOF also conducts prescribed burning. However, most of the VDOF burns are conducted for preparation of cutover areas to be replanted, and these burns can be conducted during summer and fall months when the 4 PM Burning Law in not in effect.

- When conducting prescribed burns, agencies make every effort to keep the burns under control. Part of the prescription specifies the equipment and personnel required to have on site prior to starting the burn. The personnel assigned are primarily fire suppression personnel, and must meet certain qualifications. In addition to federal qualification requirements, most federal burn managers are certified under Virginia's "Prescribed Burn Manager" program, though not required by law to do so.

For more information, contact VDOF, Charlottesville, VA