FIRE MANAGEMENT PLAN

FOR

ASSATEAGUE ISLAND NATIONAL SEASHORE

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I. INTRODUCTION

Despite a brief period of real estate speculation in the mid-1900's, the Maryland portion of Assateague Island has been and remains, a natural and essentially undeveloped barrier island. Forces other than fire have played the major roles in shaping the island and influencing the patterns and composition of the vegetation on it. With the possible exception of the scattered forested areas such as Green Run and Pope Island, there is no evidence that natural fires have occurred on the island with sufficient frequency or intensity to influence the ecosystem. Scattered fuel patterns, abundant natural firebreaks and generally high fuel moisture have combined to place fire rather low on the list of natural forces affecting the island. However, construction and maintenance of an artificial dune line in recent decades has nearly eliminated the principal vegetation-influencing factor of ocean overwash. In most areas between the dunes and the bayside salt marshes, dense growths of bayberry, small loblolly pines, blackberries and other shrubby vegetation have occurred. This has resulted in a nearly continuous fuel pattern that in some cases extends for miles along the island and covers hundreds of acres. Indications are that much of the island is more densely vegetated now than at any time in recent history. This poses a potential fire hazard that has not, until now, been addressed by a fire management or suppression plan.

II. POLICIES AND OBJECTIVES

A fire management program for any NPS area must be guided by the policies found in Chapter IV of the National Park Service Management Policies, the Fire Management Guidelines (NPS-18), and Chapters 1 and 2 of Departmental Manual 910 DM.

In addition, Assateague Island National Seashore fire policy conforms to the following general objective found in the Statement for Mangement: "- to manage the seashore in ways that protect natural, ecological and geological processes and mitigate human influences on these processes, while providing for a broad range of recreational activities."

Suppression efforts on the NPS-owned portion of Assateague Island National Seashore will be directed toward safeguarding life and property while protecting the park resources from undue impacts. All fires will be controlled through methods that take full advantage of natural and man-made fire breaks such as open sandy areas, the bay and associated guts, and existing roads or ORV trails.

Specific Fire Mangement Objectives:

1. To suppress all wildfires as quickly and as safely as possible with the least adverse impact on Park resources.
2. To continue research into the natural role and behavior of fire on the island
3. To use fire as a natural and cost-effective method of removing man-made structures and returning associated areas to a natural vegetation pattern.

III. AREA DESCRIPTION

Geology

Most geologists agree that the barrier islands of the Atlantic and Gulf coasts were formed during the period of rising seas following the last period of continental glaciation. The glaciers of the Wisconsin period began to recede northward about 20,000 years ago. At that time, sea levels were some 300 feet lower than they are today due to the water contained in the continental ice sheet. Also at that time, the coastline of the Delaware Peninsula was located approximately 62 miles east of its present location (Natural Resources Institute 1970). The glaciers receded during the next 8,000 years, releasing water which caused the rising sea levels.

Although most geologists believe that sea levels have risen continuously for the last 20,000 years, the Delmarva coastline was within a few feet of its present location as early as 4,000 years ago (Dolan et al. 1977). The Atlantic and Gulf shore zones occurring between the Wisconsin period and the present are gently sloping and composed of unconsolidated sediments. As the coastline advanced, the ocean brought along a large mass of sand in the form of a beach deposit. When sea levels stabilized about 4,000 years ago, ocean levels continued a slow rise. Erosional forces formed "inlets" in the barrier dune system, allowing the rising seas to flood the gently sloping "flats" behind. According to Hoyt (1967), todays's barrier islands are remnants of that 2,000-year-old barrier dune system.

Other theories hypothesize that the barrier islands were formed as offshore bars that grew as a result of depositional and erosional forces between the bar and the beach face. Tectonic elevation and/or lowering of sea levels may have played a part in this growth pattern. Regardless of origin, the islands have been somewhat stabilized by the establishment of rooted vegetation behind the primary dunes and in the shoreward bays. Today this stability is constantly tested by natural forces. In fact, Assateague Island was separated from Fenwick Island (to the north) with the formation of the Ocean City Inlet by the August 23, 1933, hurricane. The jetties were subsequently built to maintain the inlet for navigation.

Barrier Island Dynamics

The active forces that produced barrier islands continue to change them. Gradual changes are measurable, and dramatic episodic changes resulting from extremes in cyclical forces (weather, sea level, etc.) are predictable.

Overwash processes have great ecological significance to barrier islands. Temporary overwash conditions can greatly alter vegetation by sediment deposition, soil salinization, and nutrient transport. Historically, frequent overwashes on Assateague Island have been a major factor in the development and maintenance of a lengthy, irregular bayside perimeter with characteristic guts, deltas, islands, shoals, and bars.

Overwash processes of sufficient magnitude can result in the formation of inlets. Inlets may transport water and sediments landward or seaward with tidal fluctuations. This process can have marked effects on the biota of adjacent areas of both ocean and bay. Most inlets are temporary, soon being closed by sediment deposition and wave action. Assateague Island has been breached by at least nine major inlets in the last 200 years, all of which have subsequently closed.

Dunes are formed by wind transport of fine-grained sand across the island. Sand is deposited on the beach face by wave action and is subsequently blown landward, building the barrier dune and subsequent systems landward of the shore zone. Winds of opposite direction may erode dunes, and overwash processes may result in a net movement of sand either bayward or seaward. A dynamic equilibrium is established when all natural forces are unconstrained by man.

Historic evidence of change in the Assateague Island shoreline dating from 1845 has been reviewed. Predicted extremes are evident at the extreme north and south ends of the island where erosion rates are far in excess of the rates observed through the central portion of the island.

The landward migration of the north end of the island has been a result of sand starvation of the north beach caused by the Ocean City Inlet jetty. These features have altered the original flow patterns of suspended sediments (littoral drift), and eddies produced by obstruction of longshore currents have scoured away the beach zone. Efforts to mitigate this effect have included the deposition of dredge spoils from the inlet on the eroding beach face.

Historically, natural resource manipulations that have affected barrier island dynamics on Assateague Island include the building of the Ocean City Inlet jetties and dredging of the channel following the 1933 hurricane, the formation of a large hydrofill "causeway" area in Maryland in the early 1950s (originally designed to be part of the bridge and road access to private residences in Maryland), and the development and maintenance of an almost continuous island-long artificial barrier dune by federal and state agencies following the northeaster of March 1962. Artifical revegetation of the dunes and interdune areas with native species has also been practiced.

Soils

The soils of Assateague Island were surveyed extensively in 1967 by the U.S. Department of Agriculture, Soil Conservation Service, for the National Park Service. The results were presented in detail in a report by P.E. Sigrist (1967). Sigrist described four sands ranging from coastal beach sand to the poorly drained Klej and Plummer loamy sands. Also described was a well-drained Lakeland sand, "made land" (or fill), and tidal marsh soil. The marsh soils varied from sands to clays and were mucky and peaty.

Hydrology and Water Resources

Annual precipitation in the Worcester County, Maryland, area averages 44 to 48 inches (NRI 1970). Only about half of this amount is available for groundwater recharge, the other half being lost through evaporation and runoff. Even so, a relatively large volume of water is available annually and, as expected, an extensive system of freshwater "lenses" is found floating on salt water just beneath the surface of Assateague Island. Shallow wells, 15 to 25 feet deep, provided usable water for earlier residents. NPS facilities on the Maryland portion of Assateague are presently served by a 186 ft. well that taps the Pocomoke aquifer.

The Pocomoke aquifer, found about 200 feet below the surface of Assateague, provides large volumes of high quality water to Ocean City. This aquifer is composed of medium to fine-grained sand enclosed by deposits of fine silt. The recharge area for the Pocomoke aquifer includes portions of Wicomico, Worcester and Somerset counties in Maryland. The Manokin aquifer lies about 100 feet deeper than the Pocomoke beneath Assateague Island, and less is known about its water quality. Both aquifers dip near the Maryland/Virginia line and become unavailable beyond that point.

Climatology

Since the National Weather Service does not operate a weather monitoring station in Ocean City, Maryland, climatological information for Assateague has been synthesized from data available from Snow Hill and Salisbury, Maryland, and from Rehoboth Beach, Delaware. Table 2 lists temperature and precipitation data for these three areas. Temperature and precipitation data is also available for Assateague State Park from 1965-1984.

In general, the Delaware Peninsula is said to have a humid mesothermal climate that is strongly influenced by maritime tropical air masses in the summer and by continental polar air masses in the winter. Most high-and low-pressure systems move from west to east. Stable high-pressure systems dominate the climate, though the most intense systems occur in storm fronts during the winter.

Average annual precipitation in the area is about 47 inches and is fairly evenly distributed throughout the year. August is usually the wettest month. Thunderstorms occur about 32 days per year with two-thirds of them occurring in June, July, and August. About 12 inches of snow falls each year in Snow Hill (EPA 1977).

Prevailing winds on Assateague Island are highly variable and frequent, and the trend is within 10 degrees of southwest. High winds from less frequently seen directions are common during thunderstorms. During summer the diurnal cycle of onshore breezes during the day and offshore breezes during the night is quite constant.

TABLE 2

Average Air Temperatures (in Degrees Fahrenheit) and Total Precipitation (in inches) Recorded at Salisbury and Snow Hill, Maryland, and Rehoboth Beach, Delaware*

AIR TEMPERATURES

MONTH	SALISBURY	SNOW HILL	REHOBOTH BEACH	AVERAGE
January	38.7	38.1	36.1	37.6
February	39.4	38.7	36.8	38.3
March	45.6	44.7	43.7	44.7
April	55.6	54.6	53.1	54.4
May	65.2	64.1	61.8	63.7
June	73.4	72.6	70.7	72.2
July	77.3	76.6	75.3	76.4
August	76.1	75.2	73.7	75.0
September	69.8	69.3	67.9	69.0
October	59.3	58.9	58.3	58.8
November	49.3	48.3	48.1	48.6
December	39.6	39.3	37.7	38.9
Annual	57.5	56.7	55.4	56.5

PRECIPITATION

MONTH	SALISBURY	SNOW HILL	REHOBOTH BEACH	AVERAGE
January	3.66	3.94	3.61	3.74
February	3.21	3.43	3.25	3.30
March	4.31	4.62	4.04	4.32
April	3.34	3.61	3.31	3.42
May	3.62	3.61	3.99	3.74
June	3.49	3.80	3.85	3.73
July	4.39	5.12	4.57	4.69
August	6.01	5.67	4.95	5.54
September	4.44	4.50	3.58	4.17
October	3.50	3.91	3.15	3.52
November	3.21	3.55	3.86	3.54
December	3.13	3.41	3.63	3.39
Annual	46.13	49.17	45.47	46.92

*From E.P.A. (1977).

Vegetation

Probably the most exhaustive study of Assateague Island flora was done by Higgins et. al. in 1971. Higgins divided all plant associations into four zones--dune herbaceous, shrub, arborescent, and marsh herbaceous. These zones were further subdivided and their component species and ecological parameters noted. In 1984 Dr. Steven Hill conducted a botanical survey of the Maryland portion of Assateague. He produced an annotated checklist, vegetation maps based on 1983 color-infrared aerial photography, and a herbarium for the park which contains specimens of all the plant species found during the survey.

Generally, plant communities on Assateague vary from sparse beach grass communities seaward of the barrier dunes, through dense shrub thickets on and beyond the secondary dunes, to wetland forest or to broad salt marsh areas along the bayside perimeter.

IV. FIRE HISTORY

Records of fire are practically non-existant for the Maryland portion of Assateague Island since the NPS began acquiring land in 1966. Prior to that time no official records were kept, and it is unlikely that fire was ever of frequent occurrence.

V. FIRE SEASON

Because of lack of weather statistics, no official fire season has been established. Indications are that the best burning conditions exist from February until spring green-up in April. During this time, fuels are dried by the wind and exposed to the sun through the lengthening days. Data from a fire weather station installed on the island in 1985 should eventually help to better define seasonal changes in burning conditions.

VI. FIRE MANAGEMENT ZONES

Except for the state park, the entire Maryland portion of Assateague Island is designated as a suppression zone, as are the lands in the Virginia portion which are owned or administerd by the NPS. All fires occurring within this zone will be promptly suppressed using methods likely to have the least impact on Park resources.

On small fires and/or those burning in lightly vegetated areas, suppression technique may consist of directly attacking burning fuels using water, sand and hand tools. In heavily vegetated areas or when a fire has attained considerable size, a fire line will be built with hand tools and widened by burning out. Roads, sandy areas, tidal guts and other natural firebreaks will be used to the maximum extent possible in order to reduce the amount of hand line construction necessary. This approach will assure relatively rapid containment of the fire without exposing firefighters to smoke from burning poison ivy or to areas of heavy fuel buildup. When retained rights properties are in or near the burning area, they can be protected by use of portable water pumps and hoses, while the fire is contained within a fire line using available natural firebreaks.

VII FIRE ORGANIZATION

1. Superintendent - All phases of park operations and administration, including fire management, are the responsibility of the Superintendent. All inquiries from the news media are directed to his office. He has final approval of all fire management and suppression plans.

2. Chief Ranger - designated by the Superintendent to implement and carry out the Fire Management Plan by:

a. assuming the position of Fire Boss on all fires. This includes the following functions:

(1) Organizes and directs the entire fire organization.
(2) Assigns personnel to specific functions.
(3) Assumes the responsibilities of fire safety officer or delegates to qualified personnel.
(4) Requests all supplies and equipment through established supply sources.
(5) Requests all necessary personnel from available park staff and/or Mid-Atlantic Region Fire Coordinator.
(6) Requests, coordinates and manages all aircraft use.
(7) Names the fire and keeps the Regional Office advised of fire status.
(8) Keeps the Superintendent informed of all suppression activities.
(9) Consults with the Resource Management Specialist concerning fire suppression strategies.
(10) Responsible for submission of the fire report (DI-1201), fire log, time records, summary of personnel and equipment, inventory of all equipment and supplies and cost summary reports.

b. Acting as the park representative at meetings related to presuppression and suppression activities.

c. Developing and updating all necessary cooperative agreements.

3. District Ranger - responsible for implementing all facets of the Fire Management Plan at the district level. Assists Resource Management Specialist in planning maintenance fires. Maintains minimum certification of Crew Boss.

4. Resource Management Specialist - as staff assistant to the Superintendent, is responsible for coordinating the elements of the fire management program and planning process relating to research and fire ecology. Works with Chief Ranger in planning maintenance burning projects where vegetation as well as structures are involved. Responsible for follow-up research and monitoring on each fire to determine effects. Acts as Park representative at meetings related to fire research and effects on natural ecosystems.

5. Permanent Rangers - Rangers stationed in the Maryland and Virginia Districts will maintain a minimum red card certification of Firefighter.

6. other permanent and seasonal employees will be trained, physically tested and certified based on availability and need.

Upon discovery of any fire on the island, the first available ranger will proceed to the scene, assess the condition of the fire and advise the Chief Ranger of the status (location, size, fuel type, behavior, staffing needs, etc.). The Chief Ranger, as Fire Boss, will implement necessary suppression actions. Except for emergencies, all radio traffic will be limited to fire operations

VIII. PRESUPPRESSION

1. Qualification and Certification - The National Interagency Fire Qualification System (NIFQS) will be used at Assateague Island National Seashore. The minimum NIFQS qualification for personnel likely to be assigned to fires will be Firefighter.

Incidental firefighters may be used on initial attack if they come upon a fire, but they may not be dispatched to a fire by park management or remain on a fire after red-carded personnel have arrived at the fire scene. Incidental firefighters are those personnel normally conducting other park activities who may take action on fires incidental to other duties with the pre-season approval of their respective division chief and the Superintendent. They will not stay on fires and will be relieved by qualified personnel as soon as possible. Incidental firefighters will have a minimum of 8 hours of local training in wildfire suppression and safety.

2. Equipment - Each District Ranger is responsible for maintaining a fire cache of firefighting equipment. Each cache will contain enough equipment to completely outfit a 16-person fire team consisting of:

- one Fire Boss
- one Crew Boss
- two Squad Bosses
- twelve Firefighters

Equipment will be kept in a high state of readiness. The Maryland District Ranger is also responsible for the care, equipping and overall readiness of the park fire truck (acquisition due FY 86). All ranger personnel will be trained and proficient in its use.

3. Equipment Inventory - see appendix

4. Fire Prevention - Both structural and wildland fire prevention will remain a high priority for all park employees. Prevention activities are ongoing throughout the year and involve:

a. Monthly inspections of all fire extinguishers.
b. Yearly inspection of all park facilities.
c. Daily fire hazard consciousness by all employees.
d. Employee training in matters relating to fire prevention.
e. Frequent inspection of fire fighting equipment, including the fire truck, to insure readiness.
f. Daily patrols by protection personnel designed to provide additional preventive and detection capability.
g. Monitoring of existing roads and trails with a view toward use as firebreaks and ready access to fires.
h. Limiting of backcountry camping to sites where vegetation is sparse or firegrates are provided.
i. Restriction of open fires to designated areas.
j. Appropriate public information on fire danger and the role of fire in the natural environment.
k. Annual meeting of fire management personnel to review the Fire Management Plan.

IX. Suppression

This plan requires all wildfires, natural and man-caused, to be suppressed. Research does not document the role and effects of fire in the Assateague environment sufficiently to allow wildfires to continue burning even under closely monitored conditions. All suppression efforts on Assateague Island National Seashore will be directed toward safeguarding life and property while protecting the resources of the Park from undue negative impacts. All fires will be quickly and carefully evaluated to determine the method of suppression to be used. The initial assessment should provide information about threats to property, resources and human life.

Suppression strategy for a fire will vary according to a combination of circumstances such as burning conditions that day, vegetation type in the burning area and threats to life and property.

X. Rehabilitation

1. Fireline - If fires are contained by taking maximum advantage of natural fire breaks, relatively little fire line rehabilitation should be required. If expanses of bare sand or soil have been exposed, appropriate native plant species will be transplanted to the disturbed area to speed revegetation. The stumps left from trees and shrubs cut during fireline construction will be cut flush to the ground. Piles of brush and other debris will be scattered.

2. Burned Area - Burned areas will be allowed to revegetate naturally. The nature of the soils and topography should preclude any significant erosion.

XI. Research

Research is needed to determine the historical role of fire in the Assateague ecosystem. It is presently considered unlikely that fire was ever a major factor influencing vegetation patterns. However, it is possible that evidence of past fires and their effects may be found by analyzing soil samples or searching historical records. Fuel modeling and analysis of fuel types and vegetation communities would also be helpful in fire management planning.

If a fire does occur, the Resource Management Specialist will initiate appropriate research and monitoring activities designed to document the effects of fire on various elements of the barrier island ecosystem.

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Maryland District Fire Equipment
Final Inventory 1984

Helmet, Aluminum Safety		10
Helmet, Safety Firefighter		20
Goggles, Safety		15
Pulaski, with Sheath		11
Axe, Double Bit with Sheath		3
Axe, Double Bit without Sheath		3
Shovel, Round Point		10
Axe, Bush		6
Axe, Bush Hook		4
Axe, Woodman's Pal		1
Axe, Sand Uik Safety		1
Fire Swatter		9
McLeod		9
Rake, Fire		8
Saw, Bow		3
Shirt, Fire Resistant (Polanide) Small		10
Shirt, Fire Resistant (Polanide) Med.		8
Shirt, Fire Resistant (Polanide) Large		5
	TOTAL	23
Pants, Fire Resistant, Waist, Sz. 28		1
Pants, Fire Resistant, Waist, Sz. 30		2
Pants, Fire Resistant, Waist, Sz. 32		2
Pants, Fire Resistant, Waist, Sz. 34		1
	TOTAL	6
Pump, Backpack (Steel)		4
Pump, Backpack (Rubber)		7
Pump, Barley Drop-in, 200 gal. tank		1
Pump, Pacific Wajax Mark 3		1
Hose, Booster with nozzle		100 ft.
Hose, 1½ inch with nozzle		100 ft.
Hose, 1½ inch, 50 ft. sections		6
Foam		5 gal.
Foam, Pickup tube and nozzle		1

Maryland District Fire Equipment
Final Inventory 1984

CO2 5 lbs.	1
CO2 15 lbs.	3
H2O Pressurized 2½ gal.	8
Dry Chemical, Class B/C, 2½ lbs.	2
Dry Chemical, Class B/C 10 lbs.	3
Dry Chemical, Class B/C 20 lbs.	1
Dry Chemical, Class A/B/C, 2½ lbs.	29
Dry Chemical, Class A/B/C, 5 lbs.	12
Dry Chemical, Class A/B/C, 10 lbs.	15
Dry Chemical, Class A/B/C, 20 lbs.	1
Dry Chemical, Class A/B/C, 30 lbs.	1

All dry chemical Class B/C extinguishers should be replaced with Class A/B/C as soon as possible.

VIRGINIA DISTRICT FIRE EQUIPMENT

FINAL INVENTORY 1984

Broom (wire)	1	
Brush Hook (single edge)	11	
Brush Hook (double edge)	5	
Pulaski	7	
Shovel (square blade--short handle)	2	
Shovel (short handle)	2	
Shovel (long handle)	10	
Flap (swatter)	9	
McCloud	10	
Rake w/handles	12	
Hard Hats	10	
Canteen (2 qt.)	7	
Canteen (4 qt.)	4	
Goggles	7	
Gloves (medium)	10	pr.
Fire shirts (5 medium, 5 large)	10	
Fire pants: 3 size 36	10	
3 size 34		
2 size 32		
2 size 38		
Pump--Gorman Rupp Back pack	4	
Pump--Gorman Rupp pump w/B & S 9 H.P. engine	1	
Pump--Darley with 11 H.P. B & S Motor	1	
Pumper Unit--Forester 50 gal. capacity, 3 H.P. B & S motor with 300 feet 5/8" hose used by Ranger Division	1	
Pumper Unit--Same as above except 200' 5/8" hose. Loaned to Maintenance Division	1	
Pumper Unit--Same as above--100' 5/8" hose	1	
Pumper Unit--Darley without motor, 200 gal. capacity 100' 1" hose	1	
Pump--Forester collapsible backpack with manual pump	2	
Pump--Mark 3, portable	1	
Suction Hose--10' sections, NH thread-1½"	3	
Suction Hose--10' section 2" NPS H thread	1	
Suction Hose--20' section 1½" NH thread, flexible type hose	1	
Suction Hose--20' sections 1" NHP H thread	2	
Fire Hose--1½" rubber lined NH thread, 50 ft. sections	23	
Fire Hose--1½" rubber lined NPSH threads, 50' sections	1	
Nozzle--1½" NH thread, "Wooster Brass"	2	
Nozzle--1½" NH thread	1	
Nozzle--1" NH, plastic	1	
Nozzle--1½" Nh thread, for spraying foam	1	
Nozzle--1½" NPSH, brass	1	
Valves--Check 1½" Nh thread	3	
Valves--Check 1½" NPSH thread	1	
Valves--Foot 1" NPSH threads	2	

VIRGINIA DISTRICT FIRE EQUIPMENT

FINAL INVENTORY

Gas Can--5 gallon capacity for backpack pumps #1 and #3	2
Gas Can--5 gallon Army type for Mark 3 pump	1
Gas Can--2 gallon	1
Gas Can--1 gallon	1