Conceptual Master Plan

Fort DuPont State Park
Delaware City, Delaware

prepared for:
Division of Parks and Recreation
Department of Natural Resources and Environmental Control

prepared by:
NATURAL LANDS TRUST

Hildacy Farm
Media, Pennsylvania

October, 1995
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Note: The Fort DuPont Conceptual Master Plan team at Natural Lands Trust Inc. was as follows:

   Peter Williamson, R.L.A.  Project Landscape Architect and Principal Author
   D. Andrew Pitz, R.L.A.  Director of Conservation Planning
   Richard Sprengle, C.L.P.  Vice President for Preserve
   Steven Kuter  Stewardship and Government Affairs Project Cartographer
EXECUTIVE SUMMARY

The Conceptual Master Plan for Fort DuPont State Park was commissioned by the Division of Parks and Recreation in 1993. The Master Plan's primary goal was to recommend a physical framework to organize the complex setting of the park around an equally complex program of interpretation and recreation. It provides general guidelines for the development program, while providing flexibility to modify the program the plan as the program matures.

The Park is located on Route 9 south of Wilmington, between Delaware City and the Reedy Point Bridge. The park is split by Route 9 into the Fort area, and "Grass Dale", a former equestrian facility. The Park's history as a military base is the basis for the interpretive program. Its subsequent use by a variety of state agencies affected the appearance of the base, but not to the point where carefully considered renovation and reconstruction could not give visitors an excellent interpretive experience. The program will be organized around the "Three Fort Concept", of interpreting Fort DuPont, Fort Delaware on Pea Patch Island in the Delaware River, and Fort Mott in New Jersey, as a unit, connected by ferry, with each fort providing a specific element to the program. Fort DuPont will be the point of orientation, and will highlight life on a military base.
The master plan makes a series of recommendations for the organizing the renovation program. Interpretation of the Fort would begin at the Visitors Center, a collection of restored and reconstructed barracks and warehouses at the center of the historic complex, which would feature both displays and "living history", the use of costumed performers to either act out or explain historical events and procedures. The partially restored gun batteries and the scattered historic structures outside the visitors center would be interpreted through self-guided tours and the living history program. Opportunities for overnight stays in renovated residences and a group camping area are included in the recommendations.

Recreation at Fort DuPont State Park will be mostly passive in nature. An extensive trail system, including accessible loops, marsh boardwalks, canoe trails, and an horse/bicycle/hiking trail to Lum's Pond State Park are included. A pedestrian bridge connecting to downtown Delaware City and a series of connections between the two halves of the park are recommended.

Water-related recreation will be an important component of the park program. A boat ramp complex with three ramps and parking for 150 vehicles with trailers will be constructed in the near future. The master plan also includes a 100-slip marina as a long-range possibility. A canoe trail system is recommended on Grass Dale. Anglers will have access to the ferry pier in the river and continued access to the Chesapeake and Delaware Canal.
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The master plan maintains the historic road system as much as possible. However, in order to separate traffic generated by the other agencies that will continue to use the Fort from park visitors, and to further separate water-related traffic from visitors to the historic complex, a series of intersection realignments is recommended. Other intersections are to be closed by bollards. New parking lots for the historic complex and Grass Dale are recommended.

The plan calls for the park headquarters to be located at the entrance to the park, in a renovated historic residence. Maintenance facilities are to be housed in existing structures at Grass Dale and the historic complex. Existing residences may be renovated for staff housing, or used for overnight stays. The plan concludes with a series of recommendations on land management, including landscaping and cleanup of areas effected by storage and use of hazardous materials.
Figure 1
Location Map
INTRODUCTION

Location
Fort DuPont State Park is located approximately eight miles south of Wilmington (Figure One). It is sandwiched between Delaware City and the Chesapeake and Delaware Canal, and is bisected by State Route 9. It has long shorelines on the Delaware River, the C&D Canal and its older branch canal. The portion of the park northeast of Route 9 ("Fort DuPont") is the site of decommissioned Fort DuPont, which operated for nearly one hundred years before being closed at the end of World War II. The southwestern portion ("Grass Dale") was an equestrian rehabilitation facility before Department of Natural Resources and Environmental Control (DNREC) purchased the property in September, 1994.

Master Plan Goals
Natural Lands Trust, Inc. (NLT) was hired by the Division of Parks and Recreation (DPR), a branch of DNREC, in early 1993 to develop a conceptual master plan for Fort DuPont State Park that would include traditional water-dependent improvements, trails, and other recreational amenities, and also the means to interpret the Fort's rich history. The Park will also be an important node in the state's "Coastal Heritage Greenway", which is being developed as a conservation and recreation corridor running along the entire coastline of Delaware. The park will become a destination or stopover for travelers using the
greenway, which is centered on Route 9 in the vicinity of Fort DuPont.

The existing physical and institutional situation at the Fort is complex. The Division of Parks and Recreation presented NLT with the challenging design problem of creating a successful park plan that incorporates the goals of DNREC:

• preserve and interpret the historic Fort complex
• provide land and water-based recreation
• link Fort DuPont to Fort Delaware and Fort Mott

These goals were to be accomplished while also accommodating the National Guard and the several state agencies that will remain at the Fort. This report summarizes the existing conditions at the Fort and the earlier recommendations of other consultants, and outlines the solution that NLT and DPR have developed together over the past two years.

**History of Fort DuPont**

The first gun battery at Fort DuPont was constructed in 1864, during the Civil War. At that time Fort Delaware, on Pea Patch Island in the middle of the river, was the primary defensive structure for protecting the entrance to the Delaware River ports of Wilmington and Philadelphia. Ten Gun Battery, as the gun emplacement at Fort DuPont is now called, was located near the base of the mortar battery. A second, larger gun battery was begun in 1870, but was never completed. The remains of Twenty Gun Battery (as this battery is now known) can be seen in overgrown ammunition magazines and earthen
Fort DuPont Master Plan

emplacements near the river shore. During same period Fort Mott was begun on the New Jersey shore (see Figure 1).

Starting in 1897 a new generation of coastal defenses was installed at the three forts guarding the Delaware. By 1902 the three gun emplacements at the recently named Fort DuPont were complete. They were Batteries Reed and Gibson, with four rifled cannons, a mortar battery for sixteen mortars, and Battery Elder, with two rapid-fire guns. When the emplacements were complete the Army began building the rest of the fort’s infrastructure according to the general plan for American military reservations. This plan consisted of organization around a central parade ground of separate residential facilities for different ranks, and support facilities in locations away from the parade ground. Through the 1920’s the number of buildings and roads increased at the base, until it closely resembled what the visitor sees today.

In 1922 the fort was transferred to the US Army Corps of Engineers and its batteries abandoned. The Works Progress Administration built a number of building at the fort during the Depression. The theater, the four brick duplexes, and the large barracks along the parade ground are the most prominent examples.

During World War Two much of the open ground east of the Parade Ground was filled with temporary wooden buildings on pilings. For a period these buildings held German prisoners-of-war. Few of these temporary buildings remain, however the road system that served them is still present, but in a deteriorated condition.
In 1945 the Fort was declared surplus government property. In 1948 it was reopened by the State of Delaware as the Governor Bacon Health Center. The Department of Health and Social Services (DHSS) still operates this facility, using the old fort buildings and some newer buildings built between the Branch Canal and the parade ground. However, in 1992 the Division of Parks and Recreation received the 184.7 acres shown in Figure 2 as Fort DuPont State Park. In 1995 DPR received another portion of the fort's historic core.

Existing Conditions
The area considered in the master plan comprises about two-thirds of an island created by the Chesapeake and Delaware Canal, the Delaware City Branch Canal, and the Delaware River (see Figure 1a). It is a mixture of open lands, marsh, young woods, and developed areas. This section of the master plan report focuses on the features present at the park that have had an impact on the park's design.

Generally speaking, the removal of scores of military buildings, the disrepair of many remaining buildings, the construction of new buildings out of character with the Fort's architecture, and the growth of trees on and around the gun batteries, have lent the grounds a neglected, disheveled appearance. Subsequent sections of the master plan recommend addressing this situation through selected renovations, landscape improvements and designing the circulation system to steer visitor's away from non-historic development.
Property Ownership
When NLT began its work, the park had only recently been created by a transfer of 184.7 acres from the Department of Health and Social Services to the Division of Parks and Recreation (see Figure 2). The transferred land included the Delaware River shoreline, a portion of the branch canal shoreline and some interior lands adjacent to the US Army Corps of Engineers (USACOE) spoil basin at the mouth of the C&D Canal. It did not include all of the historic fort complex, the New Castle County Sewage Treatment Plant, the Division of Fish and Wildlife’s (DFW) property at the base of the C&D Canal spoil basin and its other property at the mouth of the Branch Canal, nor Grass Dale. Subsequent to NLT being hired, discussions between DPR and DHSS opened the possibility that DHSS could, over an unspecified period, relinquish its use of the Fort. Given the DPR purchase of Grass Dale and these on-going interdepartmental discussions, the scope of the master plan was expanded to consider all of the former Fort’s acreage.

Environmental Features
Topography: With only about eight feet of topographic relief from the marshlands to the natural high point near the northeast corner of the Parade Ground the park possesses the generally flat, open character of coastal Delaware (see Figure 3). The upland portion of Grass Dale is roughly divided into three peninsulas, or necks, that jut out into the surrounding marshland. These necks increase in length from north to south, with the southernmost being nearly half a mile long, or twice as long as the northernmost neck. The two more southerly necks have high ground in their extremities, The Fort’s higher ground arcs around the Parade Ground from the Branch Canal, along the river shore, to the
Route 9 bridge. The batteries and the spoil basins are considerably higher than the surrounding landscape.

**Wetlands:** while there are no permanent, non-tidal streams on the park property, its proximity to water bodies and its low topography cause much of the park to either be classified as wetland or as having a watertable close to the surface. Figure 4 shows the areas on the island where these conditions exist.

More than half of Grass Dale is impacted by the various classifications of wet soils. The tidal wetlands (categories "2" & "3" on Figure 4) are marshlands that were impounded when the Delaware City Branch Canal was constructed in the nineteenth century. The dikes along the branch canal that impounded the marshes have since largely eroded, allowing tidal creeks to fill, and then drain the marshes with each change of tide.

There are also tidal wetlands along the Delaware River and between the gun batteries and the USACOE spoil basin. These marshes and those on Grass Dale have been colonized by common reed (Phragmites australis), an aggressive wetland grass that invades disturbed wetlands. Following a management regime it pioneered in the Delaware Estuary, DNREC has sprayed and burned the reed on the Delaware River portion of the park for several years. This has greatly reduced the extent of the reed stands.

The remaining wet soil categories shown on Figure 4 delineate areas where the watertable may be close to the surface. U.S. Soil...
Fort DuPont Master Plan

Conservation Service mapping, from which these soil categories are taken, is not detailed enough to differentiate which portions of these lands actually do have a high water table, it merely suggests that there is a high likelihood that the lower areas do. Construction of new roads or structures in these areas is possible, but the areas to be disturbed should avoid, as much as practically possible, disturbance of wetland soils.

Soils: The upland soils on the site present no significant development constraints. Figure 5 illustrates the Soil Conservation Service soil types. It shows that almost all the structures and roads on the site have been constructed within the well-drained Matapeke Silt Loam and Matapeke-Sassafras Urban Land Complex soils. The only exception may be for the few roads and buildings found within the Aldino-Keyport-Mattapex Urban Land Complex soil, but this soil is only wet where found in depressions.

Upland Vegetation: There are no areas of existing vegetation in the park that could be characterized as pristine. The majority of the park area is in turf or meadow. The meadow areas are being colonized by multi-flora rose (Rosa multiflora), Chinese bittersweet (Celastrus orbiculatus), and Japanese honeysuckle (Lonicera japonica), aggressive alien plants common in old fields in the region. The woodland areas are limited to the periphery of the Fort and the fringes of the marsh on Grass Dale. The largest patch of woodland is found between the river and the batteries. The tree species in the woods are lowland species such as sycamore, ash, maple, large tooth aspen, and mulberry. The woods feature thick tangles of greenbriar (Smilax spp.) and
honeysuckle. Between the mortar battery and the river the woodland undergrowth has been removed by DPR, leaving a glade of trees to be developed as a picnic area.

Spoil Basins: While not on the park property, the USACOE spoil basins for the C &D Canal and the Branch Canal have a visual impact on the Delaware City side and downriver side of the park due simply to their height and size. Their outside berms are approximately ten to twenty feet higher than the surrounding land. Their interiors hold somewhat barren landscapes of reed and open water. USACOE intends to continue using the larger, southerly basin for dredge spoil.

Existing Roads
Route 9: This state highway bisects the island and the state park. The highway rises from north to south as it climbs to cross the C&D Canal on the Reedy Point Bridge. For much of its course through the park the roadbed is actually in the air, with the series of columns that hold the bridge allowing potential passage between Fort DuPont and Grass Dale. The only existing passages are a road that crosses under the first portion of the aerial section toward Delaware City and a gravel service road paralleling the C & D Canal.

North Reedy Point Road: This road parallels the southwest side of Route 9. It connects Route 9 to the USACOE canal service road. Its intersection with Route 9 is adequate for its current volume, but may present problems when it is used as a major exit for the park, due to its alignment and slope. A traffic engineering analysis at this intersection should be undertaken before any alignments are revised.
Figure 7

Important Site Features
**Historic Roads on Fort DuPont:** A number of historic streets still exist at the Fort. Their locations and their names can be seen on Figure 6. All are paved, two-way streets. The intersection of Elm Avenue and Route 9 provides the best sightline for traffic exiting the complex. The road accessing the sewage treatment plant on the river is not historic. For historic accuracy it is important that many of the historic streets as possible be retained in their historic alignments. Some intersections though, may need to be modified and others closed to separate different users of the site.

**Historic Buildings and Landscapes**

The entire Fort area retains 81 structures over fifty years old. These structures are fully documented in a report, discussed later, prepared by the University of Delaware Center for Historic Architecture and Engineering. Within the current park boundary there are over twenty historic structures. Some of these structures have been recently renovated and others are dilapidated beyond reasonable repair. Historic maps show that many more buildings once occupied areas now in open land. The three gun emplacements constructed along the river shoreline during the Spanish-American War era remain, but are seriously deteriorated.

The central Parade Ground (see Figure 7), which is intermittently lined with shade trees, is the strongest remaining landscape element in the military layout. Along its long southern axis are three substantial historic buildings that provide the proper architectural enclosure, and terminating the view from Route 9 are the old Theater and PX. The
Parade Ground is designated as the main visitor entrance in the master plan due to its ability to evoke the site's military past and pastoral qualities.

*Modern Buildings*
There are several modern buildings on the Fort grounds which will not immediately be a part of the park that do not contribute to the historic context. Most obvious are the “Meadows” complex northwest of the Parade Grounds, the Department of Administrative Services metal building on Battery Lane and the National Guard building. On Grass Dale, the former owner ran a 16,000 square foot rehabilitation facility for race horses in a modern block building. He also constructed a five-bay garage, horse paddocks, and an oval track. DPR has converted the block building into “Grass Dale Center”, housing Fort Delaware Society offices, meeting rooms, repository, carpentry shop, and artifact storage. The garage, the track and paddocks will be converted to maintenance and recreational use, respectively.

*Other Agencies at Fort DuPont*
Other agencies and organizations also use the Fort at present (see Figure 8). They include DHSS, the Department of Administrative Services (which stores surplus equipment in several buildings), the Division of Air and Waste Management, and the Division of Emergency Preparedness. As mentioned previously, DHSS’s future at Fort DuPont is under review. For the purposes of this master plan, it is assumed that DHSS will continue to occupy its current buildings.

The Department of Emergency Preparedness now occupies the
Other Agencies at Fort DuPont
underground portion of the mortar battery, but has decided to move to another location off-site. The Department of Administrative Services has no plans to move its facility from the Fort in the near future.

The National Guard also has a large facility at the Fort. It consists of a large modern building and parking lot near the Route 9 bridge. The USACOE owns a spoil basin and a corridor of land along the C & D Canal, and DNREC’s Division of Fish and Wildlife owns the strip of land between the Corps spoil basin and the Reedy Point Bridge. The Division of Fish and Wildlife will construct a large public boat launch on the branch canal near its confluence with the Delaware River. It will consist of a ramp for landing three boats, a 150-car/trailer parking lot, comfort station, and pump-out station. The Division of Parks and Recreation will manage the boat launch as part of Fort DuPont State Park.

*The Park’s Surroundings*

On the island formed by the Delaware River, the Branch Canal, and the C&D Canal, the only private lands are in “Polktown”. This row of homes at the entrance to Grass Dale contains a few historic structures and other homes from the twentieth century. These homes are in various states of disrepair. The master plan calls for eventual acquisition of these properties to provide administrative offices for the park.

On the northwestern bank of the branch canal is a spoil basin for the main canal maintained by the USACOE. It features a service road that runs along the western bank of the Branch Canal, and then continues
westward along the main canal, passing by Lum’s Pond State Park
(approximately six miles from Fort DuPont State Park) before
eventually crossing into Maryland. A similar service roadway runs
along the main canal on the southern border of Grass Dale and the
Corps spoil basin at the mouth of the main canal. There is no bridge
crossing of the branch canal to connect these two service roads together.
All of the USACOE lands along the C & D Canal are managed by the
Division of Fish & Wildlife for hunting, fishing, and public access.

Across the C & D Canal on the river side of Route 9 is another spoil
basin at the canal mouth, and a service roadway that also runs the full
length of the canal. Just to the south of the spoil basin is DNREC’s
Augustine Wildlife Area. South of the canal, on the western side of
Route 9 is Thousand Acre Marsh, a privately-owned, impounded
marshland.

On the northern side of branch canal is the town of Delaware City,
which had its initial growth when the branch canal was not a branch,
but the only route of the C&D Canal. Today it is a quiet, mostly
residential community, with a business center located just across the
branch canal from the Fort. Continued viability and improvement of
Delaware City’s business district was an important consideration in this
master plan. DPR runs its ferry service to Fort Delaware from a state
pier in Battery Park, located at the mouth of the Branch Canal. DPR and
DFW maintain offices at the pier.
Three Forts Concept

The main portion of Fort Delaware State Park is located just offshore on Pea Patch Island. Across the river and slightly upstream is Fort Mott, a New Jersey State Park. The three forts were first built in the mid-nineteenth century, and were equipped to repel a naval invasion of the major cities on the Delaware River. The States of Delaware and New Jersey will institute a ferry service and an interpretive program to allow visitors on either side of the river to visit and understand the relationship between the three forts. Currently, visitors to Fort Delaware board the ferry at the mouth of the Branch Canal in Delaware City. The master plan provides for direct public access from Fort DuPont to Fort Delaware and, in the future, Fort Mott in New Jersey by calling for the construction of a new pier at the historic pier site at Fort DuPont.

Antecedent Documents to the Master Plan

The Division of Parks and Recreation commissioned several studies on the Fort in order to uncover its history and to determine the best means to take advantage of its remaining buildings. These studies were essential to the development of the final design.

"Fort Delaware and Fort DuPont State Parks Interpretive Plan"

InsideOutside, Inc.

In 1993 InsideOutside, Inc., of Austin, Texas, produced an interpretative plan for both Fort Delaware and Fort DuPont. This plan outlined a

This strategy endorsed the three fort concept by calling for the two forts in Delaware and Fort Mott in New Jersey to be interpreted as a single unit, focused on the history of the coastal defense system in the United States. Fort Delaware would remain the central tourist destination, with Fort DuPont providing secondary functions of parking, self-guided tours of the historic buildings and batteries, embarkation to Fort Delaware, and day use. Its central role in the three fort concept would be to hold the visitors center for all three forts. Secondarily, the Fort’s Theater would be used as the operating center for a summer troupe that would produce plays at the theater and provide performers for “living history” at the two Delaware Parks. Living history is the use of costumed performers to help visitors understand the time period being interpreted.

The plan suggested using the mortar battery, where the Division of Emergency Preparedness now has its offices, as the visitors center (this idea has since been discarded due to the high cost of maintaining the underground facility and the unsuitability of its long, narrow spaces). It envisioned construction of a plaza holding large artifacts and exhibits at the entrance to the visitors center.

It also called for reusing the Fort’s theater for AV programs and local theater productions, and using other buildings as Bed & Breakfasts and housing for employees (such as the performers) employed at Fort Delaware. It noted that development of the park should be balanced
Between the historic areas and the day use areas and that these functions should have separate entrances.

Many of layout ideas contained in the InsideOutside report have been incorporated into the master plan, but many of its programmatic recommendations are too detailed to be considered at this point in the planning process.

InsideOutside did not attempt to definitively answer one of the more daunting problems inherent in any historic site: given the great cost of renovation and continued maintenance, which buildings should be renovated, and how will they be used for the interpretive program? Given the great number of buildings and the number of agencies involved, this is not surprising. This master plan assigns potential uses for many of the historic buildings in the park.

"Fort DuPont, Delaware: An Architectural Survey and Evaluation"

Center for Historic Architecture and Engineering

In June of 1994, the Center for Historic Architecture and Engineering (CHAE) of the University of Delaware produced a survey report evaluating the historic fabric of Fort DuPont and its likely suitability for inclusion on the National Register of Historic Places. The detailed report describes the history of Fort DuPont (the result of original research by CHAE) from its earliest construction in 1863 through World War II. It also describes, dates, and evaluates every structure remaining on the Fort grounds.
The report concludes that the great number of “significant” and “contributing” historic structures remaining at Fort DuPont makes it well-suited for inclusion into the National Register. It also clearly describes how the Fort meets the relevant standards of the Department of Interior for the National Register. Finally, the report notes the importance of the “military landscape”, e.g., the road system and Parade Grounds, to the historic fabric. This master plan retains the road system and emphasizes the setting of the Parade Ground.

“Fort DuPont Management Plan”

Caroline Fisher

In 1994, as part of her Masters thesis, Ms. Fisher, who co-authored the CHAE survey report, prepared a detailed twenty-year phasing plan for stabilization and interpretation of the historic structures at the Fort. Stabilization refers to repairs sufficient to prevent further deterioration of the structure. Interpretation requires further renovations and an interpretive program. The plan has a more detailed listing of future uses for the historic buildings than previous documents, but does not attempt to provide definitive uses for every building recommended for interpretation. For example, it specifically calls for the historic bakery, located on Battery Lane, to be converted to administrative offices, and for a visitors center (“contact station”) to be located in a restored building or buildings near the center of the park (see Master Plan).

The management plan also recommends the development of design guidelines for structures and the landscape to help DPR maintain the feel of a historic military base as it renovates old buildings, constructs
new facilities, and restores the plantings. It suggests the formation of a review board to regulate implementation of the guidelines.

"Structural Survey, Fort DuPont State Park"
Gredell Associates
In 1993, Gredell Associates, a structural engineering firm from Wilmington, analyzed fifteen historic structures on the park grounds and recommended means to stabilize and restore them. Cost estimates were included. The costs were significant, even though they did not include any interior renovation on the buildings.

"A Concept Study for Unused Lands and Existing Buildings at Governor Bacon Health Center"
Sasaki Associates
This document was commissioned by DHSS and DNREC. It was completed in 1991. As a means to discern the best means to utilize the surplus grounds and buildings of the Fort, the study looked at three alternative schemes for constructing a 150-slip commercial marina and multi-family housing at the fort. It concluded that none of the schemes would have a rate of return suitable for a private investor. More importantly for this master plan, it recommended the creation of Fort DuPont State Park.
MASTER PLAN DESCRIPTION

Major Design Considerations

A series of important design considerations influenced the final plan for Fort DuPont State Park. They are summarized below:

- **Day use:** The park will be primarily for day use, with some capacity for overnight accommodations and, possibly, group camping.

- **Separation of state agencies from park areas:** Because the existing road system and ownership pattern does not provide an adequate and understandable separation between the public park and other areas dedicated to agencies that will continue to use the Fort, park visitor and agency traffic will be separated as near the entrance as possible. However, for preservation purposes, the historical road system needs to remain as intact as possible.

- **Separation of the historic site from boat ramp:** Park visitors to the Fort portion of the park will fall into two broad groups, those coming primarily to experience the historical elements, and those coming to utilize the marine facilities. Separate circulation for these two groups is desirable due to their different needs and hours. However, visitors should be able to enjoy both aspects of the park without having to move their car.
• **Direct access to Fort Delaware:** direct ferry access from Fort DuPont to Fort Delaware, and by extension, Fort Mott in New Jersey, is considered central to the design of the new state park. A visitors center for both parks should be closely associated with the new pier.

• **Connection to Downtown Delaware City:** Since ferry access is currently provided from Delaware City, and the ferry pier is important to the town’s central business district, a means to connect downtown Delaware City directly to the park is also important to the design.

• **Reuse of historic structures:** To the maximum extent feasible, historic buildings and their settings should remain. Appropriate uses should be found for the remaining buildings. Landscape improvements to restore the historical setting should include street tree plantings and removal of vegetation from the gun emplacements.

• **Variety of trail experiences:** Trails are one of the most extensive improvements envisioned in the master plan. Accessible trails for horses, canoes, exercise, historic interpretation, and enjoying nature, and for connecting the two parts of park together and the park to its surroundings, are all important to the design.

• **Strong trail connections between Grass Dale and the historic area:** The two halves of the park are separated by Route 9 and the
Reedy Point Bridge. A series of trail connections will be provided to ensure that park users can traverse the width and length of the Park.

- **The entire island should be managed as a unit:** because several state agencies and the U.S. Army own pieces of the island, a management arrangement that coordinates the programs of all organizations would eliminate overlaps and increase efficiency.

- **Open areas must be carefully managed:** the open meadows, young woodlands, and marshlands of Grass Dale and Fort DuPont must be managed to improve and maintain their ability to support native plants and animals. Alien invasive plants threaten the diversity of native plants in all three environments.
Master Plan Elements

CIRCULATION

The movement of vehicles through the park is probably the most important consideration in the master plan. Because of its importance, it will be described first. Following this description will be sections on the facilities for different users of the park.

Main Entrance/Contact Station

All visitors to the park, and vehicles destined for other agencies’ facilities, will enter the park on the west side of Route 9 on North Reedy Point Road, just south of the Branch Canal. Constructed in the right-of-way of North Reedy Point Road past the Polktown homes will be a small Contact Station (see Figure 9). Entrance traffic should be split, with a lane for state employees, and another lane shared by visitors to the park and visitors to the state offices.

Realignments for the Entrance Drive

A series of minor realignments of intersections are proposed to allow easier and safer access to the visitor parking areas on the Fort side of the park.

Past the Contact Station the road alignment should be modified so that the entrance to the Fort is the primary route, and entrance to Grass Dale via North Reedy Point Road is a secondary, right turn.
Primary Vehicular Circulation
After passing under the Route 9 bridge, non-park traffic (except that which would continue to the DHSS “Meadows” facility) will turn off the main park entrance drive at a realigned intersection, onto Battery Lane. The alignment of the main entrance drive where Battery Lane and Oak Lane meet would be modified to permit park visitors to proceed onto Oak Lane without pausing.

Colter Road, running along the southeastern side of the Parade Ground would become one-way exiting onto the main entrance drive at its current location, or preferably could be closed and become part of the park’s pedestrian/bike paved trail system.

The current intersection of Oak Lane, East Canal Street, and Elm Avenue would be modified so that traffic on East Canal Street would exit directly onto Route 9 and park visitors would move, without stopping, from Oak Lane onto Elm Avenue.

Park visitors would proceed on Elm Avenue along the Parade Ground, DHSS-related traffic would exit from Elm into the Meadows. The exit from the Meadows would be to East Canal Street only, creating a one-way loop from Elm to East Canal. Officer’s Lane would be closed and restricted to pedestrians and bicycles.

**Separation of Marine and Fort Traffic**
Where Elm Avenue now ends at Officers Lane, a Y-shaped extension of Elm would split the marine traffic, which would turn left toward the boat ramp on Airfield Road, and the fort traffic, which would turn right onto the existing road alongside the Theater. This road would be
extended toward the river, then turn southeast into a newly constructed parking area. The marine traffic would enter the ramp area and its associated parking area. Maple Boulevard’s intersection with Elm Avenue would remain, but would be closed with bollards, as would the existing intersection behind the Theater.

To exit the marine facilities during park hours, vehicles would return along the entrance route. After hours, East Canal Street would be used as a direct exit to Route 9. At some point, likely to be at the closing of the Meadows, DPR plans to convert East Canal Street into a multi-purpose trail. At that time all vehicular traffic would exit the park via the entrance route.

*Isolating the Park from Non-Park Vehicles*

Visitors to the historic facilities will be walking once they park their cars in the new lot. In order to protect their safety, all the existing connections between the non-park areas and Maple Boulevard would be closed with bollards. Further to the southeast, near the POW area, the bollards would be placed at the intersections of Engineer Road and the unnamed street alongside the POW Barracks, and Powers Lane.

*Circulation on Grass Dale*

The circulation here is much simpler. North Reedy Point Road remains the sole access route to the maintenance garage, the canoe and horse trailer parking lot, the Grass Dale Center, the picnic area and the C & D canal. Access to the C&D Canal service road at the end of North Reedy Creek Road would be controlled through the use of two manually operated gates. The first would be placed just beyond the
entrance to the picnic ground to cut off all vehicular access to the service road for whatever reason. The second would be placed across the service road just to the southwest of its intersection with North Reedy Creek Road and would direct vehicular traffic toward the mouth of the canal for continued use. The canal service road southwest of North Reedy Creek Road should be closed, designated for pedestrian and bicycle use, and equipped with new lighting suitable for a waterfront walkway. The entire Grass Dale property should be able to be closed by means of a gate installed close to intersection of the North Reedy Point Road and the entrance drive.

VISITOR FACILITIES

Historic Interpretation

Historic interpretation will encourage the visitors’ imagining of the once thriving fort community through viewing the preserved physical remnants of that community, and through the use of costumed performers for “living history”.

Visitor’s Center

The Fort DuPont State Park visitor’s center would serve as an introduction to the entire three fort complex. It is located at the center of the historic area, within the blocks bounded by Dock Road, Maple Boulevard, Quartermaster Road, and an unnamed street running parallel and to the northeast of Dock Road (see Figure 10). It would be housed preferably in a series of renovated buildings existing on the fort grounds, or failing that, in newly constructed buildings based on army stock plans. A layout of buildings is shown on the master plan drawing
that is based on a record plan for the Fort from 1913. The functions of
this complex could include:

• welcome station
• ticket sales for ferry
• audio/visual orientation
• permanent and temporary exhibition space
• plaza for large military artifacts
• classroom space for school groups

Signage in the Fort parking lot would direct visitors to the visitor’s
center. From the center visitors could choose to take a tour of Fort
DuPont, or proceed directly to Fort Delaware ferry pier. The center is
close to the picnic grounds and shoreline, where passive enjoyment of
the park’s scenery is anticipated. The visitors center should also
provide opportunities for an introducing the living history aspect of
the park to visitors. The interaction of the performers with the visitors
would then continue throughout the historic complex

Gun Batteries

The three gun batteries from the turn of the century, the remnants of
the Civil War-era gun battery (Ten-Gun Battery), and Twenty -Gun
Battery (from the 1870’s) and its associated powder magazines are likely
to be the most attractive historic features for visitors. They will be
interpreted by a living history program and a self-guided walking tour
(the tour would include all the historic features of the Fort). In the flat
coastal landscape their sudden earthen bulk will make for a dramatic
display, if the trees that have grown on them and continue to
undermine their concrete walls are removed (historic photos
demonstrate that the batteries were constructed in a treeless landscape).
Gredell Associates, Structural Engineers, of Wilmington provided a
detailed description of the deterioration of the batteries and the means
and costs of restoring their structural integrity ("Structural Survey, Fort
DuPont State Park", Gredell and Associates, August 1993). Given the
significant costs of completely improving all these structures ($895,000
for preservation alone, another $390,000 for restoration), means to
stabilize the structures at minimal cost should be sought. The
following recommendations are premised on minimal preservation
and minor restoration. In developing the renovation specifications
consideration should be given to the needs of the living history
program.

The mortar battery now houses the Division of Emergency
Preparedness. When the Division vacates the facility DNREC should
not attempt to maintain the underground offices for park purposes,
and if feasible, the facility should be gutted of modern additions,
leaving only the original concrete passageways and lighting, with
moisture-proof interior displays of period photos, plans, artifacts, etc.

The rifle Batteries "Reed and Gibson" should have their downstream
fill slopes restored to original grade, and an accessible means to view
the rifle mounts should be constructed. This may consist of a path up
the fill slope, a restored catwalk on the fort side, or wooden steps and
boardwalks. The underground ammunition chambers should be
stabilized, restored as funding permits and opened for the walking
tour. Until restoration, the ammunition chambers should be gated off
for viewing only. As a long-term goal, DPR should consider placing
replicas of the disappearing rifles, mortars, and rapid fire guns in their proper places on the batteries. Real guns or fiberglass replicas could be used. Exhibitions of gun-firing, loading, etc. by costumed performers could be an element in the living history program.

Twenty-Gun Battery should have most of its vegetation removed and signage placed near its remnant features. A few large shade trees may remain if they are not damaging entrances to the powder magazines or remnant walls. One of the powder magazines should be chosen to remain open for interpretation and the others gated, but with viewing permitted.

The much smaller rapid fire gun Battery “Elder” (CHAE), or “Ritchie” (Gredell Assoc,) should be stabilized sufficiently to allow visitors to mount the stairs. The woody vegetation between it and the river should be cleared.

Historic Buildings
The physical presence of the historic buildings at Fort DuPont exerts a powerful effect on visitors. They are reminiscent of the variety of daily activities that occupied the denizens of the Fort in its heyday. As such they are important, at the most basic level, as props for the interpretive program. In addition many of these buildings could be productively reused to serve the living history or other interpretive programs, or other park needs. The appropriate degree of restoration is dependent on the building’s program use; a prop, or backdrop does not require the same degree of internal renovation as a building to be used for program elements. In its renovation program, DPR should consider
projected uses for the buildings that bear a relationship to the buildings’ historic uses.

The master plan shows 30 preserved historic buildings in the expanded park area. This should be considered the maximum number of buildings that would be potentially saved in that area. Assessment of the costs to do so and their importance to the final interpretive program will determine the extent of building restoration. Buildings that are to utilized for program activities, should receive priority for complete renovation. For instance, the buildings in the visitors center are to used for displays and orientation. This would require complete internal and external renovation. The residences along Maple Boulevard between the visitors center and the gun batteries are foreseen initially as backdrops to the self-guided tour, therefore they would receive primarily external renovations.

Outside the initial park area are a number of very important historic buildings. DNREC should work with DHSS and DAS to ensure that these structures are maintained and renovated appropriately. The design review board mentioned in Caroline Fisher’s report, and endorsed by NLT, would be a good means to institute this coordination.

Many of the Fort’s historic buildings have been demolished. As a means to add interest along the roadways and to organize the broad open spaces between the batteries and Route 9, it would be appropriate to mark the foundations of these old buildings with cast concrete corner posts, or fencing, or some other means to allow visitors to
envision their positions, and to erect interpretive signage explaining their function. This might be particularly effective in the area that was dominated by temporary buildings during World War Two.

**Ferry to Fort Delaware**
A new accessible pier would be constructed at the historic pier site at the terminus of Dock Road. It could be similar in plan to the old dock. Ferry tickets would be purchased at the visitors center. A wide wing of the pier would be set aside for anglers. Bait and tackle should be made available for purchase by anglers, either on the pier itself or at the end of Dock Road. DNREC should determine whether the pier needs to accommodate two ferries or only one, and whether the pier could be used by transient boats for special events (tall ships, the Queen Elizabeth II, etc.).

**Day Use**

_The day use areas of the park are oriented toward passive recreation and are scattered throughout the grounds._

**Picnic Areas**
There are two developed picnic areas called for in the master plan (see Figure 11). The first would be in the historic fort area, in the grove of trees at the northeastern base of the mortar battery. It is close to the parking lot, the pier, the nature center, and the batteries, and enjoys a view of the water. It would be serviced by a concession and restrooms in one of the metal buildings located on Dock Road. The other picnic area is on Grass Dale in a grove of trees southeast of the track. It would have access to the park trail system and would be adjacent to a large
turf play field suitable for informal games or kite-flying. It is serviced by a 30-car parking lot and would have toilet facilities.

Special Events Area
The area between the river and the visitors center is particularly well-suited for hosting large special events, such as fairs, auctions, or re-enactments. It is close to parking, flat, and enjoys excellent views of the river. The master plan shows an extension of the formal, double row, street tree plantings extending into this area to provide shade, to direct views, and to organize this large area into distinct areas.

Trail System
A variety of trails are shown on the master plan. They would offer opportunities for short strolls or long hikes both within the park and down the C&D Canal to Lum's Pond State Park. The old road system in the fort will be devoted to trail users, both walkers and bikers. Maple Boulevard, Dock Road, and the streets within the visitors center will serve as main routes for pedestrians moving through the historic part of the park. The other components of the system are as follows:

- Paved loops- A ten foot wide, asphalt accessible loop trail system will be organized into two rings. The first ring will begin at the visitors center and loop around the batteries and shoreline before returning to the picnic ground. It will serve as an important component of the self-guided historic tour. The second ring will run along the shoreline to the boat ramp, with a connection to the Delaware City pedestrian bridge over the
Figure 11
Trails & Picnic Areas
Branch Canal, and return to the visitor center from the boat ramp parking lot. It will allow visitors to park at either the fort lot or the boat ramp lot and still visit the entire park. Along the two rings, side trails will connect to the original road system, and soft surface trails will connect the river shore to Grass Dale. Bicyclists, strollers, wheelchairs, and rollerbladers will be able to use the trail.

- Marsh Trail- This soft surface, eight foot wide trail would cross the marsh of Grass Dale where the three necks are closest to the dike along the branch canal. The trail would run along the dike and connect across the necks to the picnic area, the track, the canoe launch, four observation platforms, and the service bridge crossing the branch canal. Where necessary, five foot wide boardwalks on pilings will be used to cross the marsh and the tidal creeks. It will provide an excellent means to interpret the marsh ecosystem.

- Equestrian Trail- This ten foot wide soft surface trail will connect the horse trailer parking area and small horse paddock to the large horse paddock at the fort. A limited loop within the fort complex would return to the smaller horse paddock on Grass Dale, and continue on across the service bridge to the canal service road running to Lum’s Pond. There it would join with that park’s horse trail system. The small paddock and parking area for fifteen trailers at Grass Dale are to be the staging area. The existing paddock sheds should be removed, unless one such shed could be logically incorporated into the new paddock.
The larger horse paddock at the fort is to be primarily a historical landscape feature, a tableau, with a secondary purpose of storing horses, and, possibly, for demonstrations of military horse training. The brick Quartermaster’s Stable adjacent to the large horse paddock may be restored for use of horses, or simply for interpretation. The horse trail could be made available for pedestrians and bicyclists.

- Grand loop- This combination surface trail will run the periphery of the park. It will include a portion of the paved loop, the old road system, the marsh trail, and the C&D Canal service road. Starting at the visitors center it would traverse the parade ground, cross Route 9 at its intersection with East Canal Street, and run along the top of the marsh dikes to the southernmost neck of Grass Dale. Here it would cross the marsh and the southwestern portion of the neck to the service road. If acceptable to the Division of Fish & Wildlife, it would then follow the service road to the mouth of the canal, thence northwest across the rim of the spoil dike to the base of Batteries Reed and Gibson. Here it would rejoin the paved loop. If this is unacceptable to DFW and USACOE, the route could cross the Fish and Wildlife property from Grass Dale Center and reenter the park near the National Guard building. Where it was not part of some other trail it would be an eight foot, soft surface trail for pedestrians only.

- Track- The track will be open to joggers, walkers, and bicyclists.
Bicycle System- The bicycle trail system will be a combination of the historic road system, the equestrian trail, the track and the loop trail. Bicyclists should not be permitted on the Marsh Trail boardwalks due to their narrowness. They should be discouraged from entering non-park areas on the Fort Grounds. This can be accomplished with signage rather than elaborate gates or fencing.

Connection to Delaware City- an approximately 200' pedestrian bridge to downtown Delaware City is recommended for the end of Officers Lane. It would allow local residents to walk to the park and visitors to walk to services in Delaware City. Its design will depend on the type of boats that might need to pass beneath it. It may be necessary to install a draw bridge operated from the boat ramp. DNREC should pursue discussions with the USACOE regarding crossing the canal and investigate purchasing sufficient land across the canal from Officers Lane for a bridge abutment. An existing, but inconvenient, connection to Delaware City is found on the sidewalks on the Route 9 bridge over the branch canal.

Athletic Courts, Playgrounds, Play Fields and Track
Limited sports facilities will be available at the park. Between the boat ramp and visitor center are two “historical” tennis courts and a basketball court. These were recently resurfaced. Two locations for a playgrounds are shown on the master plan. One is situated between the basketball and tennis courts. The other is adjacent to the picnic area off Dock Road. One or both may be constructed over time, depending on
demand. DPR would like to see the playgrounds developed around a military theme.

Near the picnic ground on Grass Dale a turf play area large enough for informal softball or soccer games is sited. The turf areas on the parade ground and between the visitors center and the river could also support informal ball games and other open air activities. The track on Grass Dale is ideal for measured running, and walking. It is shown with an adjacent parking lot. The master plan shows observation platforms for viewing the restored marsh and tidal ponds where the track crosses the tidal creek. DPR should consider renovating the track surface and marking the perimeter with distance posts.

**Waterfront Activities**

*Water-related activities are likely to be the most popular forms of recreation at the park. The master plan shows a concentration of these activities at the mouth of the branch canal and others scattered through the rest of the park.*

**Boat Ramp**

The boat ramp design is taken from drawings prepared by Andrews Miller and Associates, Consulting Engineers and Surveyors, Cambridge, Maryland, from March of 1993. It includes three ramps and 150 parking spaces for vehicles with trailers. The Division of Parks and Recreation will manage this facility.

**Marina**

The marina is shown for purposes of long-range planning. It is located on the spoil basin at the mouth of the branch canal (see Figure 12). As
Figure 12
Waterfront Facilities
such, its construction would involve moving tremendous quantities of spoil to reach a sufficient bottom depth for a commercial marina. If so decided, the park has the advantage of being large and flat enough to support the spreading of this material on turf and meadow areas, without markedly changing topographic relationships. The marina shown could easily hold up to 100 slips in the 14’ to 35’ range and is equipped with an office/shop/restaurant, ramp, dry stack, storage yard and parking for 100 cars. It could be reached on foot from Delaware City. Portions of the existing berm enclosing the spoil basin could be left intact to visually buffer the marina and perhaps provide weather protection as well.

**Fishing**

Fishing would be possible on the ferry pier, along the canal service drive (per USACOE regulations), and in locations where open water is adjacent to a trail. Such locations would include the marsh trail, the canoe trail, and the extension of the loop trail near the rapid-fire gun battery. DPR should develop policies to avoid use conflicts between visitors to the historic complex and anglers using the same areas, such as the master plan provision for a separate area for anglers on the ferry pier.

**Canoe Trails**

Grass Dale provides an opportunity to install a system of canoe trails and shallow ponds (for shorebird habitat). The primary function of the canoe trails would be for Open Water Marsh Management (a marsh management technique that controls mosquito populations by creating shallow ditches and ponds that allow fish that prey on mosquito larvae
to reach larvae hatch sites), but by adding naturalistic, meandering directional changes and launching areas, these otherwise functional channels would also become recreational, and fit more naturally into the landscape. The trail system shown on the master plan is purely conceptual. It is premised on a desire to connect the channels into a system with the tidal ponds and to provide two small boat launching areas— one near the small horse paddock, and another smaller one near the picnic area. These trails could be used by other small boats in addition to canoes. This may open up some concessionaire/revenue possibilities for DPR.

**Overnight Use**

*Opportunities for overnight stays are part of the master plan. If DHSS completely vacates its facilities, there may be opportunity to develop a conference center or hotel facility using the large, former barracks facing the Parade Ground.*

**Overnight Accommodations**

The master plan indicates that the four duplexes in the visitors center complex would be renovated to allow overnight stays (see Figure 13). The brick houses, built originally as non-commissioned officers quarters in 1933 (CHAE), would allow their tenants easy access to the historic area and the marine facilities. Three historic bungalows on Maple Boulevard, a duplex on Officers Lane, and the row of six duplexes along Battery Row are also available. These could all be converted to overnight use, giving DPR 25 potential units. Their use could be tied to an integrated tourism package that would link the
Figure 13

Overnight Facilities
shores of the Delaware together via the ferry service connecting the three forts, or use access to the river in some other advantageous way.

**Group Camping**
The southwesternmost neck of Grass Dale provides a meadow site for group camping. This would be in the nature of special event camping, such as a period costume groups, or scouts doing a service project at the park. Services would be minimal, likely to be running water and composting (or even portable) toilets.

**SUPPORT FACILITIES**

* Maintenance Center

Currently the maintenance employees of the park are working out of a wing of the Grass Dale Center. When new facilities are available, maintenance operations will be moved to the garage at Grass Dale and the historic maintenance complex at Fort DuPont.

The garage on Grass Dale (see Figure 14) will be used for storage and maintenance of heavy equipment, such as tractors and mowers. It has adequate room to hold large vehicles and equipment and is centrally located. If the heavy equipment needs of the park outgrow the garage, the master plan shows a pole building of similar size as the garage placed southeast of the garage to create a 10,000 square foot maintenance yard. The center should be fenced, well-lit and heavily
Figure 14
Support Facilities
buffered with landscaping from North Reedy Point Road.

The maintenance complex at Fort DuPont contains eight buildings. The master plan shows their ownership being split between DHSS and DPR by the road that connects Maple Boulevard to Powers Lane. The two agencies should develop a integrated program to renovate this complex as a long-term maintenance center for structural maintenance facilities and employees.

**Staff Housing**

The eleven duplexes and three bungalows within the park could be used for staff housing. One duplex unit, a former non-commissioned officer's house adjacent to Dock Road, has already had one unit renovated for the park superintendent. When the remaining units are renovated the park could house twenty-five employees, private rentals, or a special housing program.

Because all the homes could also be developed as overnight facilities (see Overnight Accommodations, above), DPR will need to balance the demand for overnight units with the need for housing. DPR may find that this balance changes over time and should therefore undertake the renovations of these units in phases (see Figure 14), and with the intention that their use could change from housing to overnight, or vice-versa.

Should DNREC purchase the homes in Polktown, several more homes
would be available for staff or rental housing, but it may be more appropriate to use the buildings for administrative or interpretation purposes, or to have a number removed.

Park Headquarters

The park holds numerous historic buildings suitable for renovation as park headquarters. The former bakery and the Quartermaster’s warehouse on Battery Lane, the Field Commander’s house at the intersection of Maple Boulevard and Elm Avenue, a building in the visitors center, and the Grass Dale Center have all been considered during the planning process. Each has been passed over due to problems of location.

The best solution for placement of the park offices appears to be within a historic home in the Polktown row. This would put the offices in a central location at the entrance and allow for convenient parking prior to the contact station, in the planting strip between Reedy Point Road and the access road. The abandoned home with brick corbeled eaves in the center of the row would appear to be best candidate due to its architectural character, however, as the cost of renovating it may be prohibitive, another home in the row may need to be considered.

Until a building is selected and renovated, the already renovated Grass Dale Center and the offices at the Delafort pier in Delaware City would serve as offices for park headquarters staff.
Sewage Treatment Plant

Although it is beyond the scope of this plan to recommend any concrete course of action, the existing sewage treatment plant is mentioned here only to point out its obvious importance to any planning considerations. Without adequate sewage treatment no improvements can be initiated. New Castle County is the owner and manager of the plant. DPR should discuss with the county the possibility of abandoning the plant when a larger facility becomes available elsewhere.

The sewage treatment plant should be buffered from the park by a double row of full-sized conifers and a earth berm. When the boat ramp is constructed, dredge material can be used to create the earthen berm.

Non-DNREC Facilities

The Department of Health and Social Services, the Department of Administrative Services and the National Guard will have a presence at the fort for the foreseeable future. Circulation issues related to their facilities have already been discussed. This master plan considers these facilities only to the extent they impact the park and future space needs of DNREC.

The master plan shows new parking lots for the state facilities that
would remove parking from Battery Lane and, if the DHSS barracks on
the Parade Ground are eventually transferred, allow for their
conversion to DNREC general offices. Removing parking will greatly
enhance the visual experience of Battery Lane, which now suffers from
large swaths of asphalt in front of its non-residential buildings. The
large DAS building on Battery Lane is the most obvious visual
intrusion into the historic setting. It appears to have many years of
useful life remaining. It should be painted white to allow it to better
blend with its surrounding, and it should be landscaped heavily with
fast growing coniferous trees to mitigate its bulk.

The DAS complex and the National Guard facility are quite close to the
horse paddock and Quartermaster’s Stable. Because their metal facades
detract from the historical illusion, a wide, landscaped buffer consisting
of a row of dense evergreens reaching 8-12’ and rows of full-sized
shade trees planted thirty feet apart on either side of the evergreen row
should be installed where indicated on the master plan. If enough
dredge material is available from the boat ramp, an earthen berm could
be used as a base for the plantings. When mature this buffer will
terminate the visitor’s view from the gun emplacements.

Similarly, the poor architectural quality of the Meadows facility will
detract from the entrance and exit routes. An evergreen and shade tree
buffer should be planted along Elm Avenue, Officers Lane and East
Canal Street similar to that used near the horse paddock, except that the
shade trees should be placed on either side of the drives in the classic
manner and the evergreen row should be installed on the Meadows
side of the row of trees. Should the Meadows be vacated and
transferred to DPR, the entire facility should be demolished, except for
the historic officers quarters on Officers Lane and the Chapel on Elm
Avenue. The resulting open field can be left as passive open space for
park visitors, or developed as play fields, or as part of the historic
complex with marking of the former hospital, fort campground,
officers club and mess hall from the inter-World War era. It may be
used as a encampment site for re-enactment events at the fort. East
Canal Drive would be converted to a multi-purpose trail connecting
downtown Delaware City, via the pedestrian bridge, to Grass Dale.

APPENDIX 1

Land Management

This appendix recommends improvements to the historic
landscape and management of natural areas to enhance
habitat quality. These are broad guidelines that should be
modified and improved by the input of DNREC land
management staff.

Site Cleanup

Fort DuPont has been an active complex of buildings for over a
hundred years. As such, its buildings contain materials, such as
asbestos and lead paint, that must eventually be remediated. This could
be a significant expense in the total renovation budget. The grounds
also contains underground storage tanks and landfills and once were
used for storage of 55-gallon drums. The known landfills and the drum storage areas were identified in a 1988 memo from DPR that is included as Appendix 2. The U.S. Army Corps of Engineers and other federal agencies could speed the remediation efforts by helping DPR to identify contaminated sites and contributing to the costs of cleanup.

**Boulevard Landscaping**

The historic areas of the park suffer from neglect of the streetscape. Photographs of the Fort in the late 1940's show a mature streetscape of shade trees providing closed canopies over many of the Fort's streets (see the "Governor Bacon Health Center" brochure, 1948). Today, besides deteriorated paving and cracking sidewalks, many trees are missing or diseased. The following recommendations can be supported historically only from a limited photographic archive, however the purpose of the recommendations is to enhance the military geometry of the fort complex by use of traditional landscape planting that Americans intuitively understand as belonging in the civic realm.

A vigorous program of replacing poor specimens and planting new trees should be undertaken immediately. The master plan indicates the major roads that should receive the most substantial treatment. These are the roads that serve as entrances and exits and, for Maple Boulevard and Dock Road, the main pedestrian streets. The special events area between the Parade Ground and the River should also receive a similar treatment of linear plantings of shade trees, as shown on the Master Plan. At minimum, the streets and special events area
should have full-sized shade trees such as oak, sycamore, ash, linden, ginkgo, or maple (not Norway maple) planted thirty feet apart in rows on both sides of the street, approximately five to ten feet from the curb or edge of pavement. Maple Boulevard, being wide and central to the Fort's layout, should receive a double row on both sides of the street. The special events area should receive double rows of trees where they are shown. While it is not wise to overuse any one species, each street or block should have a signature tree. Trees grown from seed are preferable to named varieties for disease resistance. If seasonal color is desirable, intersections and curves can be planted with clusters of smaller flowering trees, such as dogwood, crabapple, purple-leaf plum, redbud, or viburnum. Clusters of three to five trees, set back from the intersection to provide visibility, are effective.

The boulevard landscaping should be simple. Extensive planting beds, numerous and exotic varieties of trees, or banks of shrubs should be avoided both because they are a maintenance drain, and because they will detract from historical accuracy and an understanding of the geometry of the military layout.

Reforestation

A number of areas in the park are recommended for a return to woodland in order to increase the blocks of forest habitat. The waterward ends of two northern upland necks of Grass Dale are the primary areas, but there are also openings in the woodlands flanking the batteries at Fort DuPont that should be filled as well. In the era of
the dominating presence of exotic plants, the major challenge of reforestation is giving native trees an opportunity to grow large enough to shade out their exotic competitors. The following provides an outline of the necessary steps for successful reforestation:

(1) Plantings should be spaced to allow for control of competing vegetation with available mowing equipment, but close enough for the canopy to close quickly. This will require a spacing of approximately 10' x 10'.

(2) Select native species that are appropriate for site conditions.

(3) Use protective measures such as fencing, tree shelters, and flexible tree guards to minimize deer damage.

(4) Reduce vegetative competition through selective herbicide use around base of tree or mowing at least four times during the growing season until the canopy has closed. After closure monitor for invasive plants and control as needed.

Meadow Management

The large expanses of meadow called for in the master plan should be the easiest land areas to manage. The following management regime is recommended:

(1) Regrade any eroded areas. Seed with a mix of native grasses and wildflowers and annual rye or oats to control erosion.

(2) Remove any trash and dispose according to current DNREC regulations.

(3) Eliminate invasives through spot spraying or wick application of
appropriate herbicide or manual or mechanical pulling. Do not use spray application of herbicides within 50’ of streams or marshland. Areas that are disturbed by manual or mechanical removal should be seeded with annual rye and/or oats and mulched to hinder reestablishment of invasives.

(4) Mow meadow twice a year at a height of 4”- 6” to prevent intrusion by woody and invasive vegetation. Recommended dates (to maximize ecological benefits) are mid-July and early March. With the exception of trails, do not mow more than three times per year. Meadows should not be mowed between March 15th and July 1st, when wildlife are nesting. Maintain trails at a 6'-8' width.

(5) If desired or needed augment existing meadow species with native species appropriate to site conditions through overseeding or installation of plugs.

(6) Monitor the meadow for intrusion by invasive plants and treat as necessary.

**Turf Areas**

The extensive turf areas at the park appear to be in fair condition. If certain areas need to be reseeded the following course is recommended:

(1) Eliminate invasives manually, mechanically, or through chemical application. Use a combination of herbicide application and cultivation several times at two week intervals to eliminate existing grasses and herbaceous plants.

(2) Regrade and seed according to appropriate state standards
Fort DuPont Master Plan

promulgated by University of Delaware Cooperative Extension.

(3) Apply lime, fertilizer, and organic matter as prescribed by a University (or comparable laboratory) soil analysis recommendation.

(4) Maintain lawn by mowing on an as-needed basis to keep grass 3"- 5" in height.

(5) Turf herbicides and pesticides should not be applied within fifty feet of marshland except as part of the restoration process.

(6) The lawn area within 10' of the marsh bank should be mowed with a walk-behind mower to prevent degradation of the bank by heavy lawn tractors.
APPENDIX 2

Governor Bacon- "Areas of Concern"

Memorandum
December 27, 1988

following pages
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF PARKS AND RECREATION

MEMORANDUM

TO: William J. Hopkins
FROM: Charles A. Salkin
SUBJECT: Governor Bacon - "Areas of Concern"
DATE: December 27, 1988

On December 14, 1988, I met at the DNREC New Castle Office with June MacArtor and Deborah Dewsbury of the Division of Air and Waste Management. We discussed our preliminary proposals for taking over portions of the Governor Bacon Health Center. Specifically, we talked about five areas within our proposed take line which have been identified as hazardous waste sites with varying levels of toxicity (see attached drawing). These are some of the concerns and issues raised by our discussion:

1. All of these sites require further testing to determine the type and extent of contamination. This will be extremely expensive and funds are not now available to any state agency for that purpose.

2. Much of the contaminated soil would have to be removed, incinerated and replaced. This will be extremely costly. In some areas, a cover of clean top soil may be adequate.

3. The boundaries marked on the map do not necessarily include all contaminated areas.

4. Run-off from the drum fire area has contaminated an area between building TF2 and Fort duPont. This has not been surveyed or tested.

5. In some areas (such as P-3) contaminants are present at the surface and present hazards to anyone who comes in direct contact with the soil (PCB's here).

6. The contents of Landfills #1 and #2 are mostly unknown.

7. There may be toxics in other areas not yet identified.
Memo
December 27, 1988
Page 2

I explained to June and Deborah that we would be willing to take over management of this land only if it were made clear that we have no legal or financial responsibility for cleaning up the sites.

June suggested that a meeting of all involved cabinet secretaries and their key staff be held to review our plans and to determine which agency or agencies will be responsible for cleanup. She said that she will initiate such a meeting by late January.

I have passed this information on to Ron McGinness and advised him that our plans will remain on hold until after the meeting.

CAS: jb
Attachment
cc: Ray Armstrong
    Earl Fenton
    Sam Mace
    Joan Brown
Summary of Areas of Concern

Landfill #1 & 2 - Landfill areas utilized by the Department of the Army during its occupation of Fort Dupont. These areas are currently being considered for investigation by the Department of the Defense under their Installation Restoration Program.

Drum Fire Area - Site of the 1985 fire involving numerous drums and containers of unknown substances. These drums were removed under the Phase 1 & 2 Governor Bacon Removal contracts. Sampling has been conducted in 1987 on and adjacent to the site which indicated levels of contamination from pesticides and base-neutral compounds. Additional sampling is needed to define the extent and magnitude of the contamination.

Drum Staging Area - Staging area for the drums involved in the 1985 fire. This area has now been cleared of all drums under the Phase 2 Governor Bacon Removal contract. Sampling is needed on this area to determine if any contamination exists as result of the staging activities.

Area P-3 - Site of a fire incident in 1985 involving five and fifty-five gallons containers. Sampling was conducted in 1987 which indicated high levels of PCBs. Additional sampling is needed to define the extent and magnitude of the contamination.
Background

Governor Bacon Health Center (GBHC) is a 320 acre site owned by the State of Delaware. It is currently occupied by numerous state and private agencies for such uses as residential treatment center for drug and alcohol abuse, a state hospital, surplus warehousing, office space, etc.

In the 1985-1986 time period, several incidents occurred on the grounds of GBHC which triggered much concern over the environmental threat posed by the site. The most serious incident to occur was a 1986 fire which destroyed an outdoor storage area involving five and fifty-five gallon containers of known and unknown hazardous substances. As a result of this incident, the State became acutely aware of the site's potential environmental liability and the necessity to address it. The plan that was developed to address the site involved canvassing the property, accumulating unwanted and obsolete goods, and preparing a contract to dispose of these goods as hazardous waste.

The responsibility at that time for the areas involved was with the Department of Administrative Services (DAS). A verbal agreement was made between Secretary Hale (DAS) and Secretary Wilson (DNREC), where Secretary Wilson agreed to address the immediate threat posed by the site.

DNREC initiated a two-phase approach for the disposal of the wastes. The first phase consisted of staging and characterizing the waste and was completed in 1987. The second phase consisted of disposal of the waste and was completed in 1988. To date, all visible waste has been disposed, but the site has not been released for use. The reason for this is that a 1987 field investigation by DNREC personnel revealed high levels of PCBs, and moderate levels of pesticides and base-neutral extractibles in the surface soil. DNREC feels further investigation is needed to characterize the extent and magnitude of the residual contamination.

Current Status

To date, the immediate threat posed by the site has been eliminated. Preliminary investigations by DNREC have revealed the presence of contamination in the soils at GBHC, which could pose a long term threat to human health and the environment. DNREC has arranged for a meeting on May 17th with all the involved Cabinet Secretaries to inform them of the potential environmental problems found by the DNREC staff. We would also like to discuss any plans they may have for future development at the site. This will enable us to develop a long term approach to the site and solicit the necessary participation from the interested parties.