

Town of Leesburg, Virginia

Veterans Park at Ball's Bluff

Master Plan



Town of Leesburg Department of Parks
and Recreation

November, 2002

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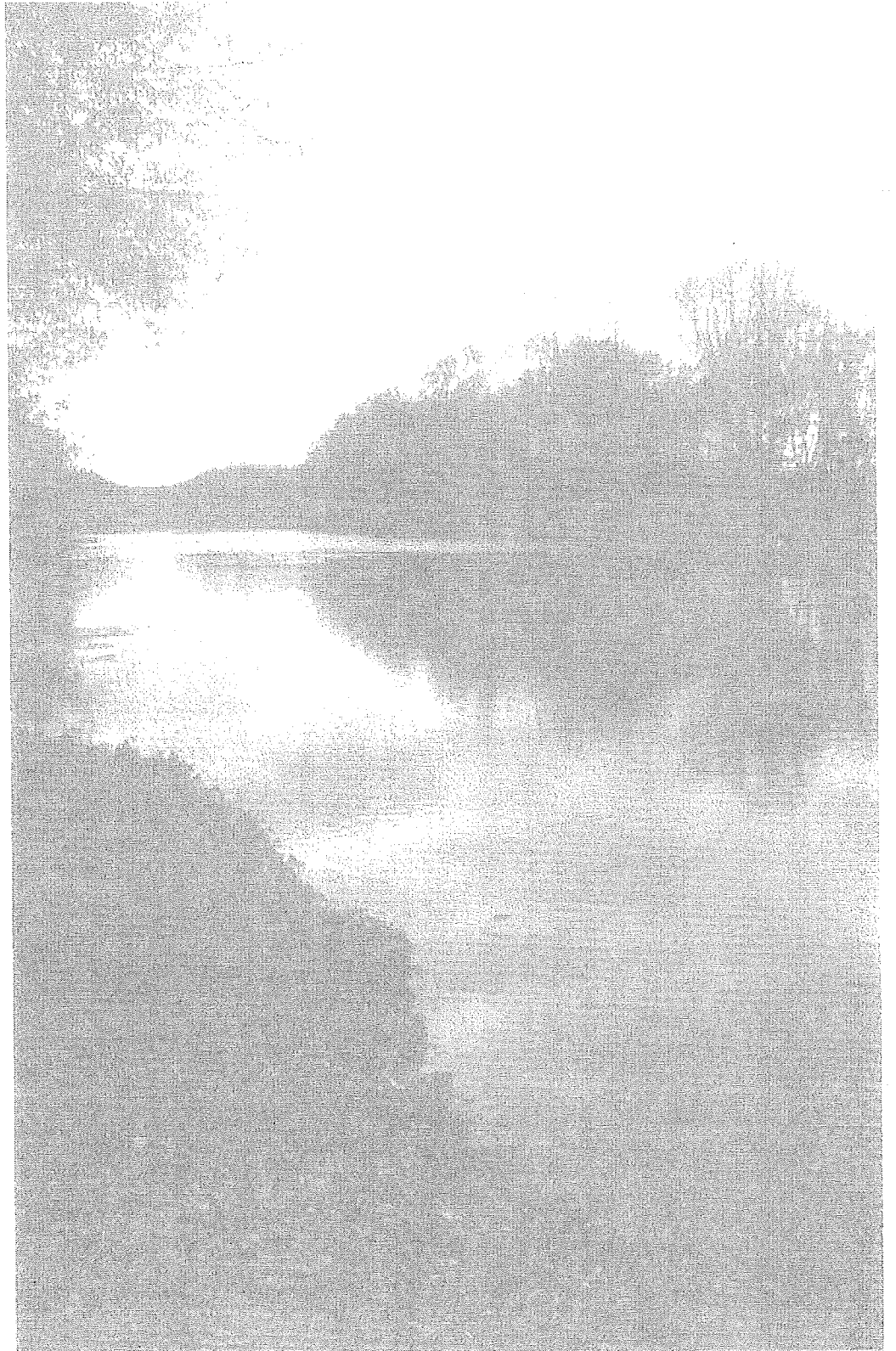
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INTRODUCTION



INTRODUCTION

In late winter of the Year 2000, the Town of Leesburg, in conjunction with the Northern Virginia Regional Park Authority, finalized the purchase of a 141 acre site adjacent to Ball's Bluff Regional Park. The Town's portion of the purchase was intended for use as a public park. As such, it would become Leesburg's second largest park and would provide the Town with its first direct means of public access to the Potomac River.

Early in 2001, the Town retained the firm of Rhodeside & Harwell, Incorporated to develop a master plan for the new park site. The planning process included:

- An analysis of existing conditions on the property, including both an environmental inventory and a cultural resource assessment,
- An summary assessment of site opportunities and constraints, including the identification of suitable program options for the site,
- The development of alternative conceptual plans,
- Presentation of the alternatives to the Park and Recreation Advisory Commission for comment,
- Several public sessions to present alternative concepts and receive comments, and
- Development of a final plan for the park.

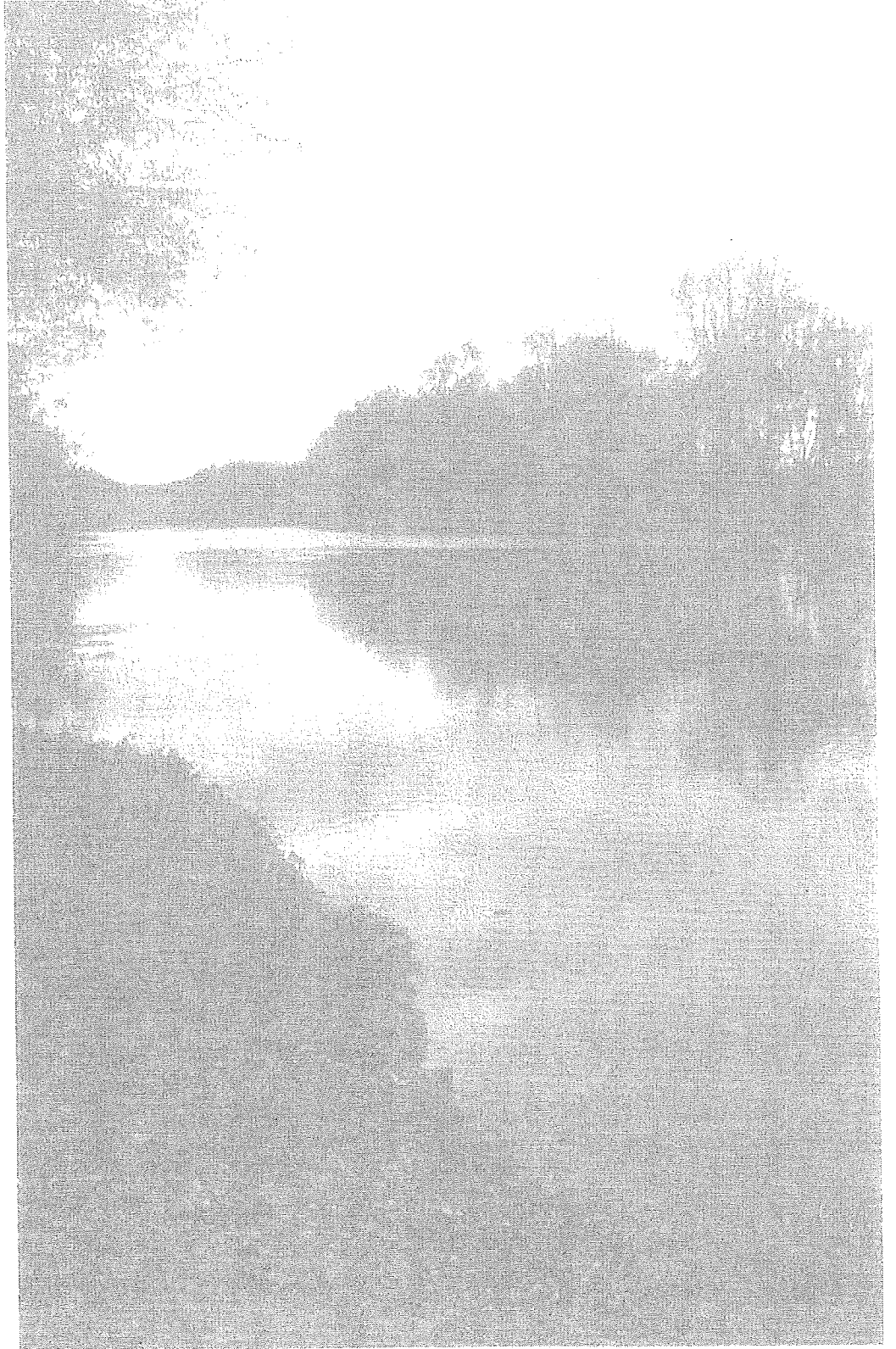
Close collaboration was maintained with the Northern Virginia Regional Park Authority throughout the process to ensure that the plan developed for the Leesburg site would be compatible with the historic Ball's Bluff Regional Park and its intended programmatic elements.

This report summarizes the planning process and presents the final Master Plan for the new park site. As a result, the Town of Leesburg will have a clear blueprint that will allow it to move directly into more detailed design development of the park.



Figure 1: A view of the Potomac River from Veterans Park at Ball's Bluff.

**EXISTING
CONDITIONS**



EXISTING CONDITIONS

BACKGROUND

Known locally as “the Walde property,” based on its former ownership by William Walde, this one hundred forty-one (141) acre parcel was purchased jointly by the Town of Leesburg and the Northern Virginia Regional Park Authority (NVRPA) in March 2000. This action preserved a significant open space, one that had come close to being lost to development with Mr. Walde’s submittal of plans for residential construction on at least part of the site. For a total cost of \$3.3 million, split proportionally, the Town of Leesburg acquired approximately eighty-six (86) acres, and NVRPA acquired fifty-five (55). The NVRPA portion of the property is immediately adjacent to Ball’s Bluff Regional Park, and provides an important natural buffer extension for that facility. The division of property had been based on the 1986 *Concept Plan for Ball’s Bluff Battlefield*, prepared by the National Park Service, which called for a 30.3 acre scenic buffer to the north of the existing Regional Park (see Figure 2).

At the present time, the park is outside the Town of Leesburg boundary, just to the northeast, and within Loudoun County’s jurisdiction. However, a Town Boundary Line Adjustment Plan is currently in process to bring the park within the Town boundary.



Figure 2: Map of historic battle area associated with the Battle of Ball’s Bluff (source: *Ball’s Bluff Battlefield Concept Plan, 1986*). The dividing line between the Town of Leesburg property and the NVRPA property (Ball’s Bluff Regional Park) is in approximately the same location as the northwestern edge of the proposed battlefield boundary.

**150 ACRE
PROPOSED
BATTLEFIELD
BOUNDARY**

SITE LOCATION AND CONTEXT

The 86-acre site comprising the new Veterans Park at Ball's Bluff is mostly wooded and gently rolling. Approximately eight hundred linear feet of the site front on the Potomac River, this frontage includes steep rock outcroppings in this area (Figures 14 & 15).

The site is located approximately 0.6 miles east of the intersection of the U.S. Route 15 Bypass and Ball's Bluff Road. The Town-owned parcel extends from the Potomac River, on the east, to the boundary of an adjoining property, known locally as the Jackson House, to the west (Fig. 9). Land uses surrounding the site are as follows: low density residential to the north, fields and forest to the west, moderate density residential to the south and west (Fig. 3), and the Ball's Bluff Regional Park to the south and east.

Figure 3 (at right): View of residential development adjacent to Veterans Park at Ball's Bluff. **Figure 4** (below): View of the boat launch ramp and winch at the Potomac River at Veterans Park at Ball's Bluff. Harrison Island can be seen across the river.





Figure 5 (above left): Existing corn crib, north elevation. **Figure 6** (above right): View north from existing road through forest to adjacent residential property. **Figure 7** (center right): View southwest along existing road from area of corn crib. **Figure 8** (below right): View north from forest in Zone 4 to silos and barn on adjacent property.



Regional Park to the south and east.

Over the past decade, the Town has experienced rapid population growth, and has witnessed the loss of hundreds of acres of farmland and forest to residential development. Loudoun County has experienced even greater population growth, and has experienced the conversion of several thousand acres of former farmland and forest to office complexes, residential communities, and other related developments. The land uses surrounding Veterans Park at Ball's Bluff are a testimony to that conversion of land from less intensive to more intensive use.

Figure 10, an aerial photo of the site, illustrates the impact of this adjacent development, which has involved the removal of most of the area's former forest cover and has required significant topographic modifications, altering many of the distinguishing features inherent in this portion of the county.



Figure 9: Site Context Map

On site, while the area is largely forested, pastureland and other open areas can also be found. Along the water, a concrete ramp and boat/cable system enable access to Harrison Island, located in the middle of the Potomac River (Figure 4). The Harrison Island property is owned by a private association that has requested assurance from the Town they will be permitted to maintain permanent and free access to their island from the new park site. The largest open area on the southwest portion of the site currently contains a mobile home trailer, a travel trailer; and three outbuildings. All are in relatively poor condition. In addition, a corncrib is located in the northeast portion of the site, about 500 feet from the Potomac River (Figure 5), while there are two metal grain silos to the west of the open pasture area (Figure 13). An unpaved road runs through the site in a southwest-northeast direction and provides access to the riverfront (Figure 7).

Veterans Park represents a significant addition to Leesburg's park system. The new site will be the second largest park within Town boundaries, and will provide the Town's first public access to the Potomac River. The site offers opportunities for both environmental and historic interpretation, and will provide residents with an extraordinary venue for hiking, picnicking, and other passive recreational pursuits.



Figure 10: Aerial photo of Town-owned Veterans Park (outlined in red) and NVRPA-owned Ball's Bluff Regional Park (lower portion of photo). The Potomac River is located along the right side of the photo.

ENVIRONMENTAL INVENTORY

The environmental inventory of the new park site assessed site-specific environmental conditions on, and immediately surrounding, the property. The factors considered included: vegetation; wetlands and waters of the U.S.; soils and steep slopes; floodplains; historic resources; and threatened and endangered species. This inventory follows on an earlier Phase I Environmental Site Assessment that was completed in March 2000.



Figure 11: View of forest and forest floor in Zone 3.

VEGETATION

A review of historical aerial photographs and topographic maps indicates that the property had been used for agricultural purposes, primarily for the raising of livestock. There was also evidence from these historic resources that the forested areas on the subject property had been logged during the first third of the 20th century.

At present, forested areas cover approximately 85% of the property. Remaining portions of the property are comprised of pastureland and open spaces surrounding a group of structures located in the southwestern part of the site. Pasture areas, located in the vicinity of these structures, encompass approximately 10 acres.

The upland forest areas on the property are primarily comprised of oak, hickory, tulip poplar and red maple. Most of the trees in these areas are deciduous and average between eight and twelve inches in diameter at breast height (dbh). The forest areas show little evidence of significant amounts of diseased, dying or damaged trees. However, in general, these areas exhibit an overall homogenous character due to lack of species diversity and similar tree size for most species. It is estimated that most of the trees in these areas are approximately fifty years old. This upland forest has not yet reached its mature, climax state (Figure 11).

A significant number of large sycamores, red maples and box elders are located within the floodplain of the Potomac River. Several trees measured 45-60 inches dbh. It is estimated that many of the trees in the floodplain are sixty to eighty years old. A few large fallen trees were also present along the embankment of the Potomac River (Figure 18).

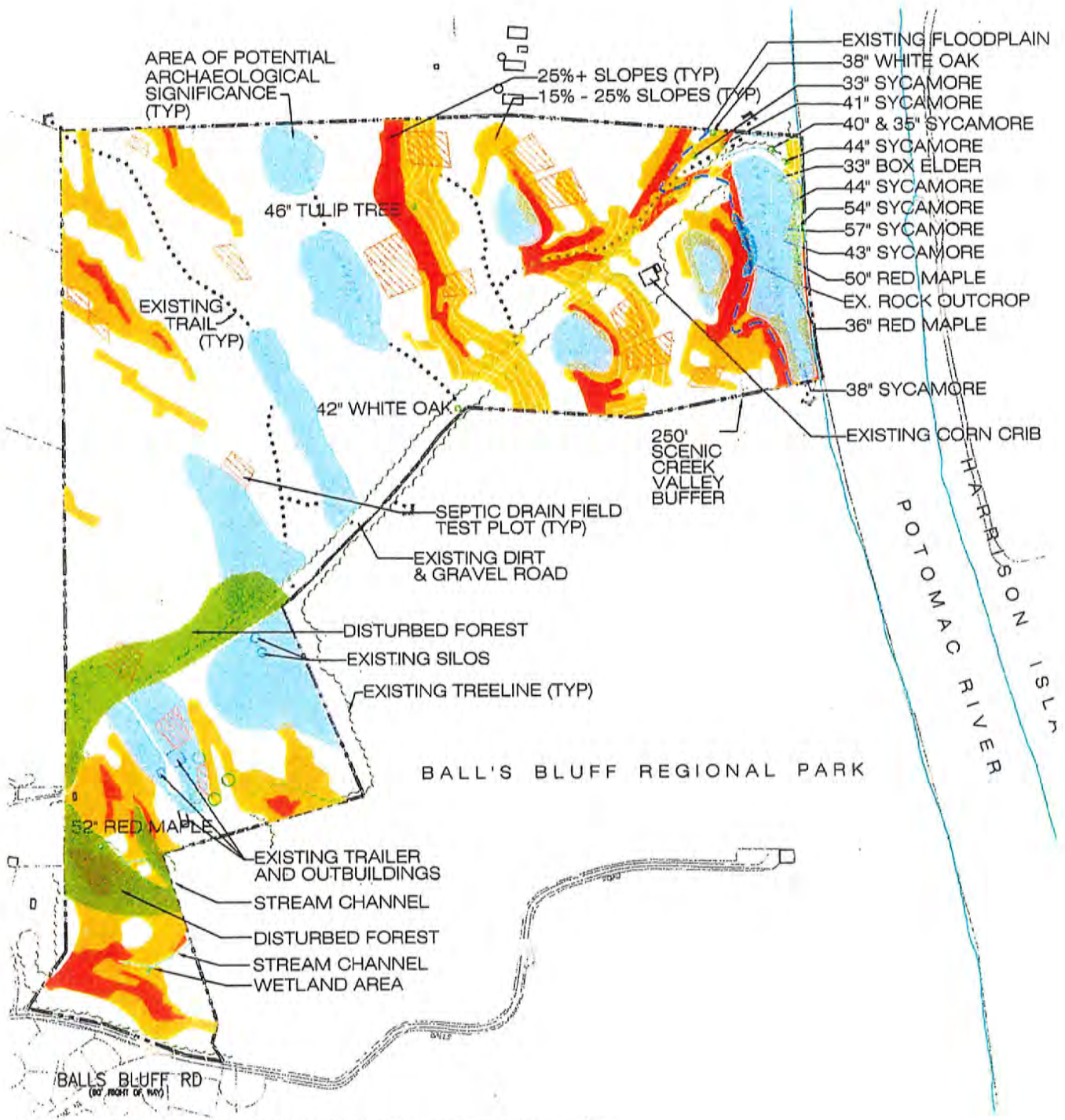


Figure 12: Environmental Inventory and Cultural Resources Inventory Map.

There are no significant amounts of understory species within the forested areas overall, although some dogwood and spicebush species are present. There is a higher prevalence of understory species immediately adjacent to the dirt road that traverses the property and in some small sections at the edge of the forest where there was previous disturbance.

Pasturelands are currently found in areas that have the least topographic gradient. It is estimated that the herbaceous grasses in these areas have not been cut in two years. Tree species, primarily locust and cedar, are beginning to regenerate in an area of pasture to the west of the existing structures. Historical aerial photographs show other areas of the property as also having been cleared for pasture. Specifically, a 1937 photograph shows a large cleared section on the easternmost third of the property.

Figure 12 indicates specimen trees located on the property. Since Loudoun County does not currently have a standard defining specimen trees, the standard as outlined in the State Forest Conservation Technical Manual for the State of Maryland was used for this assessment. According to this manual, specimen trees are defined as those having diameters of thirty inches or more, as measured at 4.5 feet above the ground. The Town of Leesburg's Design and Construction Standards Manual requires the identification of trees with a dbh of 18 inches and over for any site plan submittal; however, identification of all 18-inch dbh trees was not required for this master plan.

One area of disturbed forest exists north of the existing dirt road and existing field. There is evidence that farm equipment has been stored in this disturbed forest edge area, and this area has a high quantity of invasive species. Much of the disturbed forest area was cleared in late 2001.

In summary, although the site's forested areas have been disturbed over time, through logging activities and general land clearing, there is an important ecological significance to its present configuration. The nature of the existing forest as a large contiguous area, and the fact that it connects to other forested areas on adjoining properties, encourages increased animal habitat and habitat corridors. A large area of connected tree canopies is especially important for enhancing the prevalence of many bird species.

While any proposed development of the property for general park uses would probably impact some of the forested areas, application of the contiguous forest concept is an important ecological consideration. Therefore, while pushing back the edges of the forest next to the pasture areas to accommodate park program requirements would allow maintenance of the contiguous forest concept, clearing large pockets of forest area would be a less desirable approach for park design.



Figure 13: View of open field area, Zone 2, including existing silos.



Figure 14 (above): East elevation of rock outcropping on bluff adjacent to floodplain along Potomac River. **Figure 15 (left):** View of same rock outcropping from the southeast.

Development of the property as a public park site should also consider implementation of a forest management and maintenance program for woodland areas that are to be preserved within the park. This program should allow for an overall natural succession of major canopy tree and understory species while monitoring for and removing invasive species, particularly at the edges of the forest. The forest management program should also outline the necessary protocol for preserving the major canopy trees along the Potomac River.

SOILS & STEEP SLOPES

The new park property is situated in the Culpeper basin, within the Piedmont Physiographic Province. The basin, which extends from the Rapidan River north into Maryland, consists of several layers of sedimentary rocks including sandstones, shales, siltstones, and conglomerates. Upland areas are typically covered with a layer of partially weathered rock (saprolite), while stream valleys are characterized by alluvium. Rock outcrops are most common along stream valleys.



Figure 16: Floodplain area within the Veterans Park at Ball's Bluff.

Soil information for the property was obtained from soil maps produced by Loudoun County's Office of GIS and Mapping. A full description of these soils is provided in the Appendix B. In summary, soils on the property are well drained to moderately well drained and exhibit a moderate rate of permeability. Most of the soil descriptions indicate bedrock within approximately 40 to 60 inches of the surface. Based on field reconnaissance, a significant number of excavated trenches were found on the property. These excavations were the result of earlier percolation tests for private septic disposal systems for a proposed residential development on the property (Figure 12). A review of information on file with Loudoun County's Department of Health indicated sixteen drainage field sites; all the fields indicated were approved by the county, having met all applicable Loudoun County and Virginia codes.

Figure 12 depicts slopes that are equal to or greater than 25%, and slopes 15-24%. Slopes with the most severe gradients are located in an area bordering the floodplain of the Potomac River, part of a linear bluff running parallel to the Potomac. Several rock outcroppings exist along this bluff. The area with the least topographic gradient is the large pasture, located in the east central section

of the property and just west of the current tenant trailer. In general, this pasture has an average slope of approximately 5% over much of its two-acre area, although slopes of approximately 14% are found along its northern edge.

Although there are several small valleys and localized drainage swales on the property, no evidence of significant erosion was found within any of these areas. There was no evidence of severe erosion on any of the steep slopes located on the property. One stream channel, located in the southwestern corner of the site and at the base of a pasture area, was deeply incised. The channel is narrow along its entire length and has not widened significantly over time.

Site soils with the highest potential for erosion are alluvium deposits found along the Potomac River, particularly during flood stages. While there was some evidence of a few major canopy trees falling as the result of the erosive forces of the Potomac River, in general the trees along the river bank are assets as their roots help stabilize the soils within the floodplain.

In summary, the site has a gently rolling topography generally descending toward the Potomac River. A long, linear bluff paralleling the Potomac River is situated approximately one hundred feet from the river's western shoreline and at the edge of the floodplain. The bluff, as well as several small ridges on the property,

imparts a particularly significant topographic character to the site. The linear nature of these ridges, as well as that of the bluff, allows the property to be easily traversed; at the same time, it enables certain vantage points for viewing the rest of the site as well as adjoining properties. Any significant grading on these high points would severely alter the site's topographic character.



Figure 17 (two photos) (photo above): View of vegetated riverbank at Veterans Park at Ball's Bluff.. (photo at right): Floodplain area within Ball's Bluff Park Site.



WETLANDS AND WATERS OF THE U.S.

A preliminary wetlands delineation of the property was performed using parameters outlined in the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual (Waterways Experiment Station Technical Publication Y-87-1, 1987). Waters of the U.S., which includes wetlands, are shown in Figure 12. The areas indicated were field surveyed using a geographic positioning system (GPS) unit; therefore the information on this base map accurately reflects their location.

Waters of the U.S., located within the property boundary, comprise two unnamed tributaries located in the southwestern part of the site, near Ball's Bluff Road. Both streams generally flow in an easterly direction, onto the adjacent NVRPA property toward the Potomac River. Only one of these tributaries is shown on the most recent U.S. Geological Survey's quadrangle maps where it is indicated as an intermittent stream. The other small stream rests in a fairly incised stream channel immediately to the north. These two streams join together just after leaving the property boundary. A small wetland area, approximately 50 square feet in size, was observed immediately adjacent to the southernmost stream channel.



Figure 18: View north along the Potomac River, Veterans Park at Ball's Bluff on the left.

In summary, the project site contains approximately 0.10 acres of waters of the United States that are subject to jurisdiction of the U.S. Army Corps of Engineers, pursuant to Section 404 of the Clean Water Act. A detailed wetland delineation, and its field confirmation by the Corps, should be conducted prior to site plan preparation. The Corps' confirmation of this detailed delineation establishes an accurate base from which the site planning process can proceed.

However, given the small extent of jurisdictional wetlands and waters on the property, as well as their general overall condition, their value as a resource to be possibly integrated within any park plans is minimal. Nevertheless, since these jurisdictional areas are protected by Federal law, any unavoidable disturbance or impact to these areas that is equal to or larger than 0.01 acres would require compensatory mitigation. Since these jurisdictional areas are forested wetlands and waters of the U.S., compensatory mitigation would be required at a ratio of 2:1. There is the possibility that mitigation in the form of wetland creation could be done on site. Areas to be designated for wetland creation could only be determined in conjunction with any proposed site development plans. The general overall land use and resulting drainage patterns would be an important component in this decision-making process.

FLOODPLAIN

Information and technical data published by the Federal Emergency Management Agency (FEMA) were reviewed along with the floodplain ordinance for Loudoun County, Virginia. The 100-year flood elevation of the Potomac River on this part of the property is 225 feet above mean sea level (msl) (Figure 12).

According to Loudoun County personnel, construction within a major floodplain is highly regulated. Any alterations of the topography within the floodplain must have a negligible impact on the floodplain limits, channel configuration and water surface elevation. Any other type of alteration will require the submission of a floodplain alteration analysis. This analysis is of varying complexity, depending on the severity of the impact to the floodplain.

RARE, THREATENED & ENDANGERED SPECIES

The Virginia Department of Conservation and Recreation, Division of Natural Heritage (DCR-DNH) provided information from their Biological and Conservation Data System (BCD) concerning rare, threatened and endangered species in or around the subject property. Natural heritage resources listed in the BCD are defined as rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

DCR-DNH reported three plant species of special concern documented within the property's vicinity: Hawthorn (*Crataegus purinosa*, G5/S1/NF/NS), White trout-lily (*Erythronium albidum*, G5/S2/NF/NS) and Short's rockcress (*Arabis shortii*, G5/S2/NF/NS). According to the State's classification system, none of the above-mentioned species are on the Federal threatened and/or endangered species list, but are classified as "Rare" by the State of Virginia. Another plant species, Shale barren rockcress (*Arabis serotina*, G2/S2/LE/LE) was also documented in the vicinity. This species is a State and Federally listed endangered species. DCR-DNH has stated that there is a potential for the site to support additional populations of this species and, therefore, recommended an inventory of suitable habitat for the species in the study area. The species requires a dry, barren climate with suitable geologic conditions on south facing slopes, and general topographic elevations between 335 feet and 760 feet above median sea level. Field investigations conducted on the site have revealed that the extensive forest cover on the property, as well as the site's proximity to the Potomac River, result in very moist soil conditions on site which are not likely to support this species. Also, the only rock outcroppings on the property are on east facing slopes within a forested area bordering the Potomac River. From discussions with State DCR biologists, and supported by data gained in the field, it appears that there is a very low probability that the site would support this species. Correspondence from the DCR-DNH can be found in Appendix C.

In summary, any requisite Federal permit applications will be reviewed by Federal agencies for potential adverse impacts on threatened and/or endangered species pursuant to Section 7 of the Endangered Species Act. If a documented threatened or endangered species exists on or around a property whose development will require a Federal or state permit, an ecological survey of the site will generally be required by the USFWS and/or the Virginia Department of Game and Inland Fisheries. A qualified professional familiar with the species is required to perform such an investigation.

Based on field reconnaissance, it appears that there is very little potential for the Shale Barren Rockcress to be present on the property. If the three above-mentioned plant species listed by the State of Virginia as plants of special concern are on the property, proposed site development could adversely affect them either directly by grading and construction, or indirectly by increased public access to their habitat. Field investigations, conducted prior to implementation of site specific planning, would accurately ascertain the presence of these species on site and, if found, possible requirements for their protection.

ENVIRONMENTAL INVENTORY & ANALYSIS CONCLUSION

The site, located within close proximity to the Town of Leesburg and its urban infrastructure, is also immediately adjacent to two important natural and historical resources, the Potomac River and Ball's Bluff Civil War Battlefield. Although eighty-five percent of the property is currently wooded, field investigations and historical document research has determined that a significant part of the site has been disturbed through logging and agricultural activities. Much of the site had been cleared in the 1930s.

The site offers two significant natural resources, both in proximity to the Potomac River, a prominent bluff overlooking the river and numerous large canopy trees on the river's floodplain. This bluff follows the western bank of the Potomac River, extending onto the historic Ball's Bluff property belonging to NVRPA.

Although the forested area on the property might be regarded as an important natural resource, its age and general overall condition would not be considered of very significant quality. Tree size and species diversity is limited and some areas of the forest show signs of recent disturbance, with invasive understory vegetation prohibiting the development of other species. However, its importance as a natural resource is related more to the fact that it is part of a large contiguous forest that extends in a southerly direction along the Potomac River. Such extensive woodland areas enhance wildlife habitat value by increasing the availability of food sources and migration corridors.

CULTURAL RESOURCES INVENTORY

In March 2001, a cultural resources assessment of the proposed new park site was conducted. The purpose of the assessment was to:

- Document all previously identified archaeological and architectural resources within the study area and its vicinity.
- Develop a cultural context based on documentary and cartographic research to identify the nature and extent of historic settlement and military activity within the study area.
- Identify areas within the study area with the highest probability for containing archaeological resources based on previous investigations in the area, predictive models for prehistoric and historic settlement patterns, and the results of a pedestrian survey of the property.

The full report of the cultural resource assessment is included in Appendix A. The major findings of the study are summarized below.

CULTURAL RESOURCES CONCLUSIONS & RECOMMENDATIONS

As a result of documentary research at the historic archives of key Virginia libraries (as listed in the Cultural Resource Assessment report) and both pedestrian and shovel test surveys on site, the assessment has reached the following conclusions:

- No archaeological sites or architectural resources within the study area have been previously identified or inventoried with the Virginia Department of Historic Resources (VDHR).
- Though the study area is adjacent to the Ball's Bluff Battlefield property (VDHR #253-5021), it lies beyond the boundaries of the core battlefield area defined in the Ball's Bluff Battlefield concept plan developed by the National Park Service in 1986 (Figure 2). It appears that the scouting party commanded by Captain Philbrick may have passed through the property on the evening of October 20, 1861; the following day, the withdrawing troops of the 15th Massachusetts also may have passed through the southwesternmost portion of the study area in the opening hours of the battle. However, it is apparent from both documentary and cartographic sources that the most concentrated and significant fighting associated with the Battle of Ball's Bluff occurred to the south of the study area on the property administered by the Northern Virginia Regional Park Authority.

Given the limited nature of the military activity on the property, it is unlikely that any significant archaeological remains associated with the battle are present.

- With the exception of the barn/corn crib, none of the standing structures within the study area appear to be over 50 years old. Regardless of age, none appears to retain the integrity of materials, workmanship, or setting to qualify them for listing in the National Register of Historic Places.
- The pedestrian survey and limited shovel testing of the study area indicated a number of locations in which prehistoric archaeological materials might be expected, including the Potomac River floodplain and several elevated landforms in the interior of the property (Figure 12). In total, the high probability areas for archaeological resources encompass approximately 15 acres. Within the floodplain, it appears that any cultural deposits would be deeply buried beneath at least 2 feet of alluvial overburden, and so would be disturbed only by significant earth-moving activities. Conversely, the elevated landforms exhibited extremely deflated, shallow soil horizons, suggesting that any sites located in these areas would be unlikely to meet the integrity criteria for listing in the National Register. Finally, though nineteenth-century maps do not indicate the presence of an occupation within the study area, the area with the highest potential for an historic occupation is the pasture in the southwest portion of the property. Mid-twentieth-century U.S.G.S. quadrangles indicate that a dwelling and associated outbuilding were situated on the landform now occupied by the trailer. The integrity of any potential archaeological remains would be dependent upon the extent of modern disturbance.
- While a Phase I archaeological survey of the property may identify previously unknown archaeological sites, it appears unlikely that this project will have an effect on significant historic properties. However, to avoid any unintentional adverse effects to archaeological resources, it is recommended that any ground disturbing activities (i.e. grading or cutting) within those areas defined as having a high probability for the presence of cultural resources be preceded by Phase I archaeological testing.

SITE PROGRAM ELEMENTS OPPORTUNITIES

Initially, the Town requested that the following programmatic elements be explored for the new park site:

- Passive recreation: e.g., trails, picnic areas, seating areas, access to vistas
- Open space preservation,
- Habitat preservation ,
- Boating: the feasibility and desirability of non-motorized and motorized options to be considered,
- Historic and environmental interpretation,
- Active recreation: e.g., soccer, lacrosse, football, multipurpose field,
- Outdoor classroom/amphitheater,
- Nature center / Visitors' center, and
- Required support uses for the site.

Based on the environmental analysis, site context, and overall site considerations, uses that the Town, working with the consultant team, felt were inappropriate for the site included:

- Any sport that would require a permanent structure, such as a fence/ backstop (e.g., baseball and softball) or pavement (e.g., basketball),
- High-impact sports, such as mountain biking,
- Motorized boating – or any sport that would require motors that would generate excessive noise, and
- Performance space that would require amplified music or speakers of any type.

SITE OPPORTUNITY AREAS

The Environmental and Cultural Resource Inventories are summarized in Figure 12. This map identifies specific environmental or cultural characteristics of individual areas of the site. Figure 19 translates this complex information into a useful tool for site planning by dividing the site into zones according to their suitability for various programmatic uses. Each zone is described in detail below.

ZONE 1: SITE ENTRANCE, BUFFER, AND FOREST CONSERVATION

This area of the site is well- suited as the public entrance for the park. Ball's Bluff Road, a public road, borders this southernmost edge of the site. No other border of the site is accessed by a public road or street. Public access at any

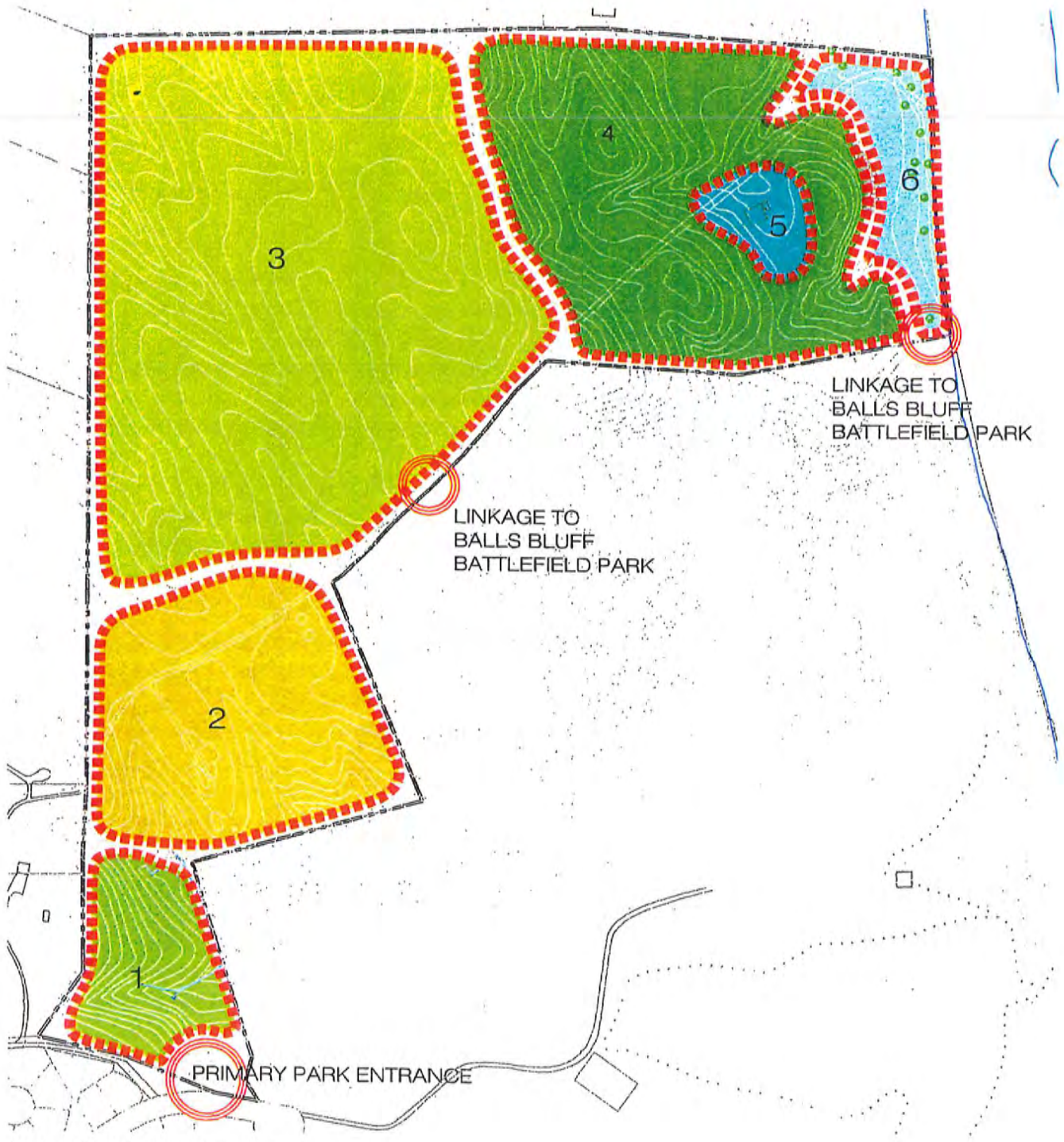
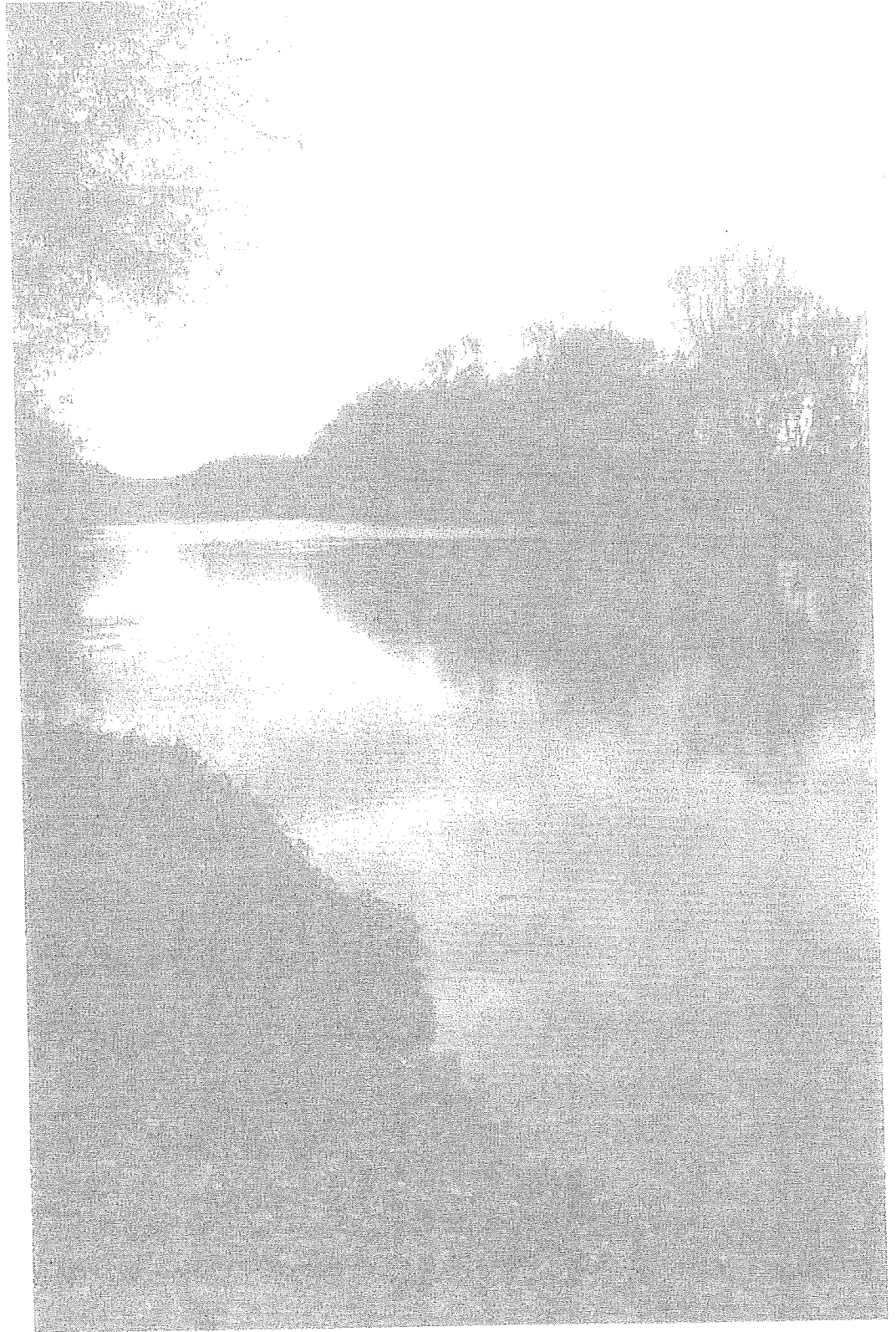


Figure 19: Site Opportunity Areas

**SITE
OPPORTUNITIES**



other point along the site border would require public acquisition of private land, which is not an optimally desirable alternative.

In addition to being the preferred location for a public entrance to the site, Zone I would also serve as a buffer between the site, the Regional Park and the adjacent community. This buffer can be achieved by careful design of the roadway through this area to provide the maximum amount of forest conservation in this zone. Furthermore, the only two Waters of the U.S. are located in this zone. Construction should avoid these areas, if possible, but disturbance could be mitigated on-site if impacted.

ZONE 2: FIELD AREA

This area of the site contains approximately nine (9) acres of open field. Most of this field area is gently sloping, with the exception of two noticeable swales. Also included in this zone are areas of disturbed forest, as identified earlier in this report.

This zone would be an appropriate location for active recreational pursuits (either formal or informal), for an outdoor classroom/amphitheater, and/or a nature center/visitors' center, as well as for more passive activities such as informal picnicking and relaxing. Active recreation requires a relatively level open area. Locating such uses in this zone would require minimal removal of existing trees, or existing healthy trees, and would necessitate less grading than would be true for most other portions of the site. Similarly, locating a visitors' center or outdoor classroom in this area would require less severe site modifications than on most other portions of the site.

One concern related to the siting of active recreation in this area is its location immediately adjacent to the Regional Park. The noise created by active recreation uses may potentially conflict with the clearly defined character of the Regional Park, which offers visitors a solemn setting in which to view the Civil War Cemetery.

ZONE 3: FOREST CONSERVATION, TRAILS, SECONDARY AREA OF IMPACT

Together Zones 3 and 4 encompass the largest portion of contiguous forest on the site. Zone 3 is distinguished from Zone 4 primarily by its degree of slope: Zone 3 is primarily comprised of gently rolling slopes while Zone 4 has areas of much steeper gradient. Forest conservation and trails are the preferred uses for this portion of the site, as these uses would preserve the maximum amount of forest cover, which has been determined to be a site asset. Furthermore,



Figure 20: View of Zone 2, the open field area. Note the existing silos to the left and the existing structures to the right.

Zone 3 also includes two of the more significant vista locations on the site, thus providing a desirable venue for siting interpretive signage, picnic areas, or seating areas that could be accessed by unpaved pedestrian trails.

Carefully planned, selective deforestation in this area could allow for development of active recreation facilities, an outdoor classroom, or a visitors' center. On the other hand, excessive removal of forest cover in this area is not recommended, and any approved site plan that requires any amount of deforestation should also include a comparable amount of reforestation. Active recreation in this area would probably require the least amount of earthwork of any area of the site.

ZONE 4: FOREST CONSERVATION, TRAILS

Zone 4 has forest cover similar to that in Zone 3; however, the forest in Zone 4 slopes toward the River at a much steeper gradient. Careful location of unpaved trails in this area would require minimal impact to the natural environment. Trails in this area would access two of the most scenic vistas on the site, including one vista from a rock outcropping just above the floodplain. Location of picnicking



Figure 21: View north along an existing trail in Zone 3.



Figure 22: View southwest along the existing road, looking toward Zone 4. Note the steep rise of the roadway in the background.

facilities is also feasible in this area. Vegetative cover in Zone 4 should be maintained, except for some selective understory clearing as required for trail access. Removal of forest cover in, or re-grading of, this area would be severely detrimental to the natural character of the site.

ZONE 5: RIVERFRONT SUPPORT ZONE

This area is an inset area to Zone 4, and immediately surrounds the existing corn crib. This area has been identified as gently sloping, and could provide a location for parking outside the floodplain, yet adjacent to the riverfront. Picnic facilities would also be desirable amenities for this area.

ZONE 6: FLOODPLAIN

In accordance with Army Corps of Engineer requirements, no permanent structures should be located within the floodplain, although a boat launch and trails would likely be allowed in this area. Furthermore, as the property is currently in Loudoun County, the riverfront area is presently subject to a scenic



Figure 23: Existing corn crib in Zone 5, the riverfront support zone.



Figure 24: Looking north from Zone 6, the floodplain, to a field on an adjacent property.

easement. Whether the Town adheres to this scenic easement once the property is annexed, it is recommended that the character of the riverfront not be changed from its existing state in order to preserve views along the River.

The possibility of constructing an unpaved parking area for the boat launch in this area was also explored. This use was, however, not pursued in a final plan for several reasons. Locating parking in this area would violate the scenic easement as vehicles would be visible from the River. Moreover, given floodplain constraints, the parking area would have to be unpaved, and would likely present continuous maintenance problems following flooding. The parking area would likely impact the roots of some of the most significant trees on the site, and would partially obstruct the view of the most scenic rock outcropping on the site. Finally, the location of a parking area in the floodplain would provide minimal turnaround space, and would potentially be less safe than parking that would provide for a full turnaround.

DEVELOPMENT OF ALTERNATIVE CONCEPTS

Having analyzed the site and identified optimal uses for specific areas, three (3) alternative concepts were developed for discussion with the Park and Recreation staff, the Park and Recreation Advisory Commission, citizens of Leesburg, and the NVRPA. These alternatives, designated as Alternatives "A", "B", and "C," are included as Figures 25, 26, and 27, respectively. Each of the alternatives explored is based on the parameters for site programming as defined above.

All the alternatives include several common elements. Each indicates a site access road that connects Ball's Bluff Road to the riverfront. This road passes along the route of the existing roadway to the greatest degree feasible in each alternative. Each alternative includes boat access with parking near the existing corn crib, although the specific configurations for access and parking may differ from concept to concept. Additionally, trails, interpretive areas, and picnic areas are indicated in roughly the same configuration in each alternative, as these amenities are largely determined by topography.

ALTERNATIVE A.

The first alternative presents a passive park concept that provides opportunities for hiking, picnicking, interpretation/education, and non-motorized boating. This alternative includes an open-lawn outdoor classroom in Zone 2, with an adjacent picnic pavilion and comfort station. The remainder of Zone 2 is left as open meadow or lawn, with the provision of approximately 20 parking spaces nearby. The lawn areas could be graded and mown to provide use areas for passive recreation or spontaneous play. The meadow areas would be mown approximately once annually to maintain their open state. Across the access road from the meadow area, in Zone 3, a second picnic pavilion and a Nature Center are provided. The Center would be a simple structure, either open air or enclosed, and would provide opportunity for environmental and historic education/interpretation. The remainder of Zones 3 and 4 would remain forested with trails, interpretive areas, picnic facilities, and parking, as required. Zones 6 and 5 contain a boat launch area and parking facility, respectively.

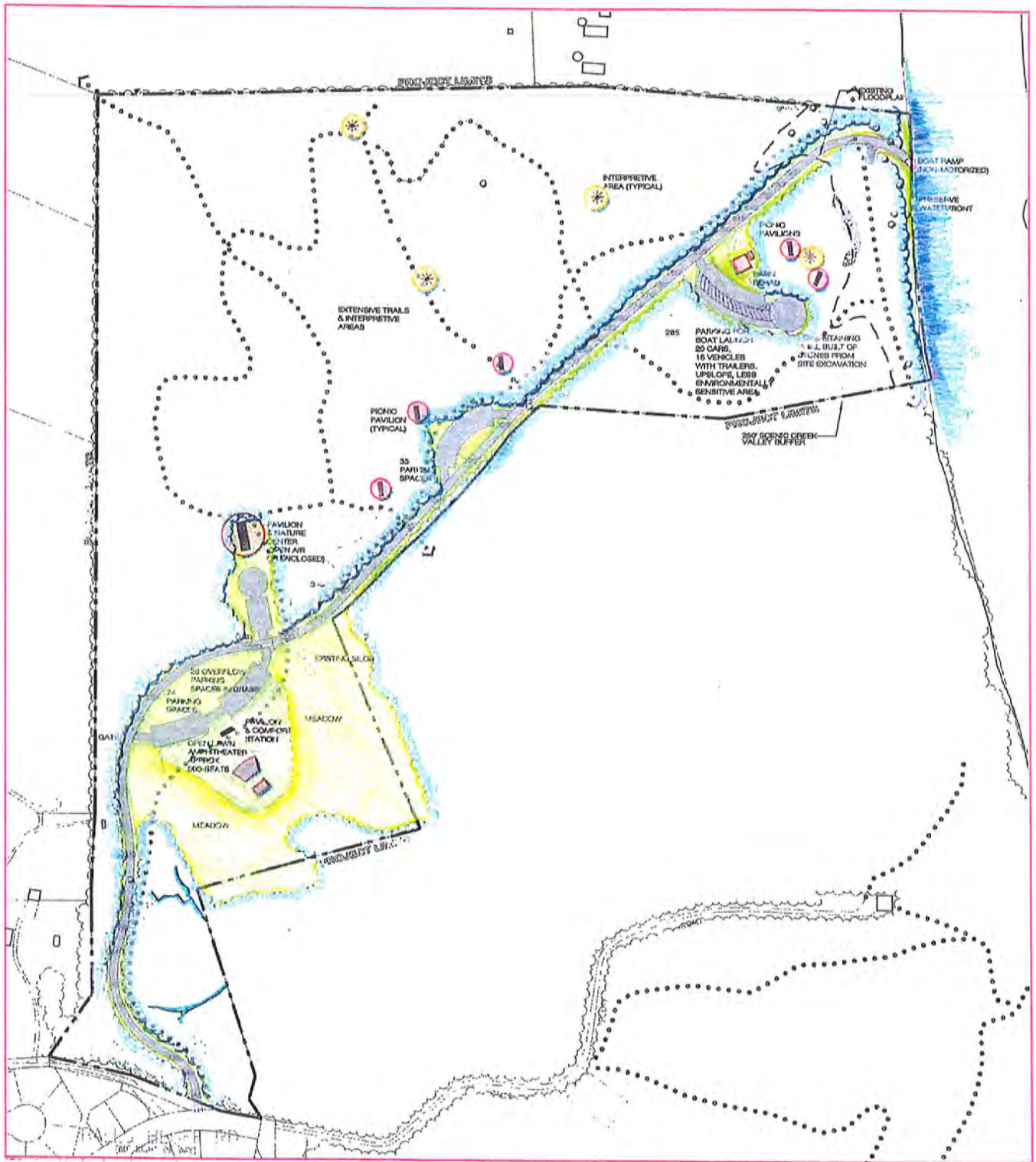


Figure 25: Alternative A

ALTERNATIVE B.

The second alternative provides an option for the inclusion of an active recreation facility in the park. This alternative differs from Alternative A in that the outdoor classroom has been moved to the edge of Zone 3, near the Nature Center, and one multi-purpose field has been located in Zone 2, surrounded by an inner ring of mown lawn, and an outer ring of meadow. Additional parking is required for the multi-purpose field, as indicated. Access road configuration, parking locations, trails, interpretive areas, picnic areas, and boat launch activities are similar to those indicated in Alternative A.

ALTERNATIVE C.

This concept, developed in coordination with NVRPA, offers a park that provides both passive and active recreational opportunities, and maximizes the adjacency of this property to the Ball's Bluff Regional Park by suggesting the shared use of access and visitor facilities between the Town and NVRPA. Such an approach minimizes land use impacts to both sites through the provision of a single roadway and visitors' center, as well as potentially maximizing cost effectiveness through the sharing of construction and maintenance costs for these elements. The shared visitors' center building is located in the Regional Park, near the border of the two properties. Access and parking to this building straddles the property line. Given the topography in this area, and the need to separate park functions, the concept suggests that either a one- or two-story building be considered. The two-story option might comprise a lower level, facing toward the Regional Park and Civil War Cemetery, to be occupied and programmed by NVRPA as the Ball's Bluff Battlefield and Cemetery interpretive center. The upper floor, occupied and programmed by the Town, would be accessed from the opposite side of the building and would face the Town of Leesburg park. This upper floor facility could contain a nature center, classroom, and/or exhibit space. Each level would have its own restrooms in order to avoid installation of an elevator and to separate the two user groups. By locating the facility across the access road from the multi-purpose fields, and by providing the multi-purpose fields with their own restrooms, the facility would likely not be overused by active recreation groups, who could potentially generate a higher level of noise and activity than would be appropriate for the more solemn NVRPA exhibit. The one-story option would need to define those facilities that could be shared between the Town and NVRPA, and those that would need to be separated.

In addition to the shared visitors'/nature center, Alternative C includes two (2) multi-purpose fields. These are located in Zone 3, which would necessitate the

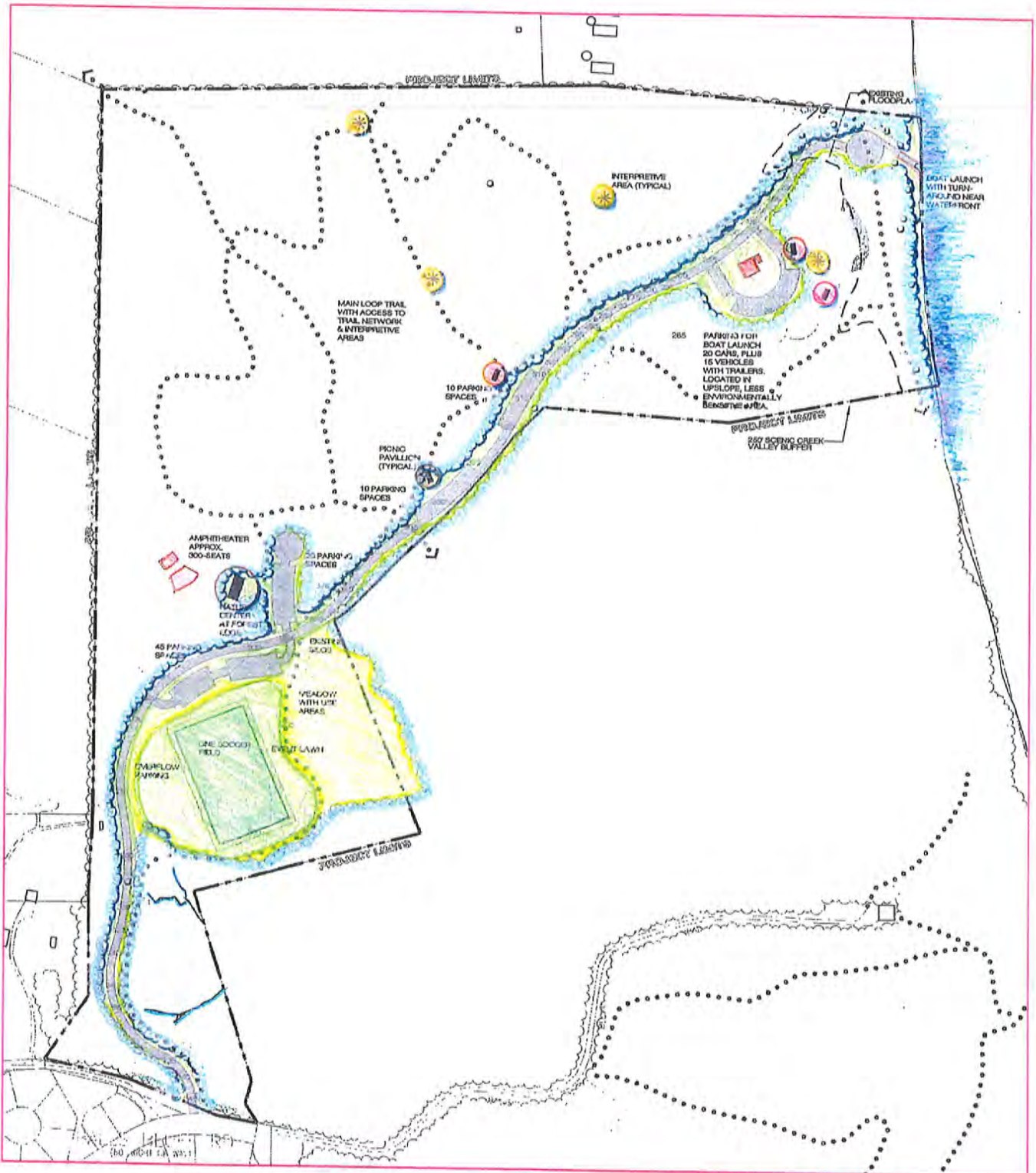


Figure 26: Alternative B

removal of some existing forest cover. There was some concern, expressed by NVRPA staff, that the location of a multipurpose field in Zone 2, close to the Regional Park boundary line, would generate a level of noise that was inappropriate to the serious nature of the Ball's Bluff Cemetery site. Therefore, the location of the two fields on the far side of the access road places them a greater distance from the cemetery area. In Alternative C, Zone 2 is shown as an open meadow, portions of which could be mown, and other portions maintained with tall grasses or wildflowers and mown only once annually. Trail systems, interpretive areas, picnic areas, and boat launch activities in this alternative are generally similar to those shown in Alternatives A and B.

AGENCY COORDINATION AND PUBLIC INPUT

As indicated above, the Town of Leesburg and the consultant team met throughout the planning process with NVRPA staff to discuss the programs for both the new Town park site and the expanded regional park, in order to ensure that any anticipated uses would not conflict or interfere with one another. This desire to be a "good neighbor" and to respect the historic, natural, and recreational aspects of both sites gradually evolved into an idea to explore the possibility of sharing certain site facilities — specifically, the access road and a building to house a visitors/nature center. This is described in greater detail under Alternative C above. Hence, as a result of this Leesburg-NVRPA coordination effort, it is possible that both entities may be able to cost-effectively share construction and maintenance expenses while, at the same time, minimizing construction impacts on both sites by avoiding duplication of these facilities.

The three alternative concepts were also presented to the residents of Leesburg at a Public Open House session on the evening of June 19, 2001. Held at the Rust Library, the meeting was structured to allow consultant team members to present each alternative concept, and to elicit comments from those in attendance. At the conclusion of the session, participants were asked to complete questionnaires that asked which alternative concept they preferred.

A total of 11 questionnaire forms were completed. From the comments received, participants were divided regarding the alternative concept they preferred. Three said they preferred Alternative A, since it would have the least amount of impact on the historical and wooded character of the site. One of these respondents noted, however, that she liked the idea of sharing facilities with NVRPA, as presented in Alternative C. Two participants preferred Alternative B, noting that the Town needs additional active recreation fields, but indicating that two fields might be too many to include on the site. Three participants reported favoring Alternative C, citing the Town's need for fields for active

recreational activities. These individuals also noted that they liked the idea of sharing facilities with NVRPA. Finally, two respondents did not like any of the alternatives, but did not provide any additional explanations.

Those residents of the community adjacent to the new park site who attended this public session indicated their concern regarding potential traffic impacts on their neighborhood if active recreation fields were to be included in the park. Given the level of this concern, it was felt that another meeting, primarily for residents of the adjacent community, was needed. This second public session was held on August 2nd, 2001, and was attended by approximately 30 residents. A full summary of this meeting is included in Appendix D.

At this session, the following concerns were voiced:

- That the athletic fields and boat ramp proposed for the site would generate a significant increase in the amount of traffic passing through the adjacent community
- That a large amphitheater would result in parking spill-over in the community
- That athletic fields were too “intensive” a use for this site

In addition, there was some discussion regarding use of Old Ball’s Bluff Road to provide access to the site rather than using Ball’s Bluff Road, as proposed in the alternatives. Residents currently living along the unpaved Old Ball’s Bluff Road expressed their opposition to this suggestion. In addition, issues to safety and feasibility were also raised.

As a result of the traffic concerns expressed by the community, the Town retained a traffic engineering firm to undertake a traffic study of the proposed program for the new park site.



Figure 29: Community Meeting to review plan alternatives.



Figure 30: At Community Meetings citizens of Leesburg were invited to comment on the plan alternatives.

RESULTS OF TRAFFIC STUDY

The study, *A Traffic Impact Analysis of the Town of Leesburg's Park Site at Ball's Bluff*, was performed by the firm of Patton, Harris, Rust and Associates. Data for the study was collected for a Friday-Monday period in October 2001. The assessment was based on a combination of the programs described in Alternatives "B" and "C" to include a multipurpose field, a visitor/nature center (possibly shared with NVRPA), trails, and a boat launch area. Existing traffic volumes along Battlefield Parkway also took into consideration the anticipated increased traffic from a completed Potomac Crossing development. In addition, NVRPA confirmed that, aside from the possible addition of the visitor center, it anticipates no major improvements to its park. Any changes would likely be in the form of additional trails and interpretive signs.

Following its analysis of existing and projected conditions, the study concluded that any traffic impacts associated with the proposed development would be "acceptable and manageable." This was true both for both the year 2004 as well as for a 20-year build-out scenario. It was determined that any changes in traffic resulting from the proposed program could be accommodated with the existing transportation infrastructure.

The study determined that any increase in vehicle traffic as a result of the park program did not alter the Level of Service (LOS) grades at the four study area intersections (Ball's Bluff Road and Battlefield Parkway, Ball's Bluff Road and Featherstone Lane, Ball's Bluff Road and Barkersdale Drive, and Ball's Bluff Road and Duff Road), except for the westbound turns from Featherstone Land onto Ball's Bluff Road. In the latter case, these turns during weekday PM peak hours operate at a LOS of "A" without the proposed park traffic, and would be projected to change to "an acceptable LOS 'B' " with the park traffic.

The study further states that:

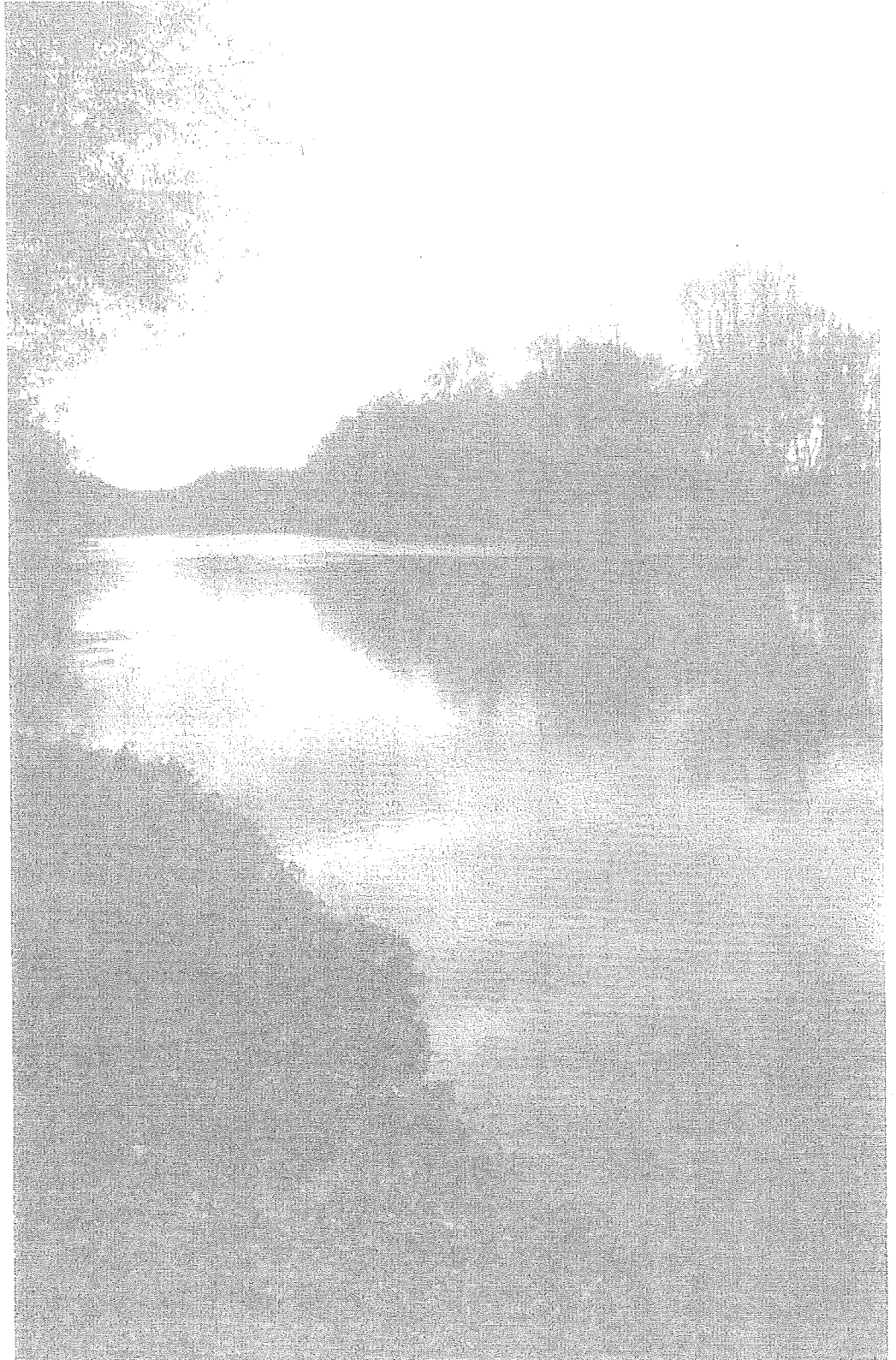
The increases in Daily traffic are within the Town's Design and Construction Standards Manual (D&CSM) guidelines for both the Weekday and Saturday conditions with the park expansion...

Finally, the study concludes:

Therefore, the proposed activities at the Town of Leesburg's 86-acre park site can be accommodated, and mitigation measures are not required for the proposed uses.

It should be further noted that the final plan, to be described in the next section of this report, eliminates the multipurpose field from the new park program. Thus, it is anticipated that the traffic impacts noted in the Patton, Harris and Rust study would be even further reduced through the deletion of this facility.

THE MASTER PLAN



THE MASTER PLAN DESCRIPTION OF THE PLAN

Following the development of plan alternatives and citizen and agency review, a preferred alternative was drafted. Neither Alternative 'A', 'B', or 'C', as described earlier in this report, was preferred in its entirety; rather the preferred alternative includes aspects of each of those alternatives as well as incorporation of comments from Park and Recreation staff, the Park and Recreation Advisory Commission, citizens of Leesburg, and the NVRPA.

The preferred alternative, developed in coordination with NVRPA, presents a passive park concept that provides opportunities for hiking, picnicking, interpretation/education, and boating, and maximizes the adjacency of this property to the Ball's Bluff Regional Park. A key component of this alternative is the shared use of visitors' center facilities and access between the Town and NVRPA in order to minimize land use impacts to both sites and to potentially maximize cost effectiveness through the sharing of construction and maintenance costs for these elements.

The shared visitors' center building would be located in the Regional Park, near the border of the two properties. Access and parking to this building straddles the property line. The topography of this area would allow for construction of a two-story building, entered at different levels from opposite sides as described under Alternative 'C'; however, given that the preferred alternative does not include any active recreation, a one story building could also potentially satisfy both the Town's and NVRPA's needs for this facility. Decisions regarding building form and programming should be made during the detailed design phase of this project. Programmatic recommendations included in the preferred alternative are a nature center, classroom, and/or exhibit space, programmed and maintained by the Town; and a Ball's Bluff Battlefield and Cemetery interpretive center, programmed and maintained by NVRPA.

A single roadway is included for access to both this property and the regional park. This roadway would connect existing Ball's Bluff Road to the riverfront and shared visitors' center following much of the route of the existing roadway. In order to intersect Ball's Bluff Road at the existing cul-de-sac, and in order to shorten the distance between the access road and the visitors' center building, a portion of the roadway is shown on NVRPA property.

This alternative includes an open-lawn outdoor classroom adjacent to the visitors' center in Zone 2. The remainder of Zone 2, on either side of the access road, is left as open meadow or lawn, with the provision of approximately 30 parking

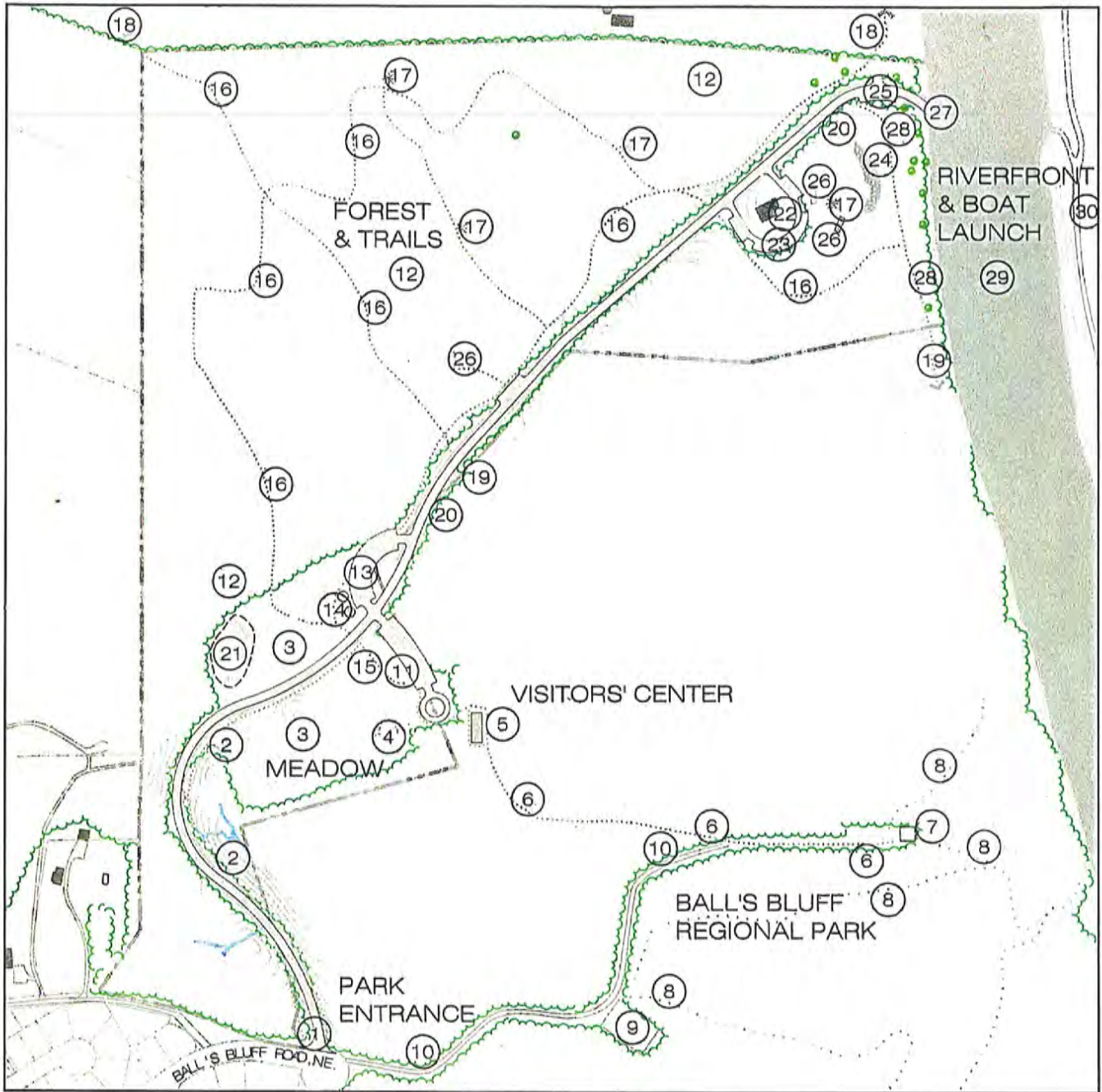


Figure 33a: The Master Plan. See "Specific Plan Elements" on Page 37 for key to numbered items.

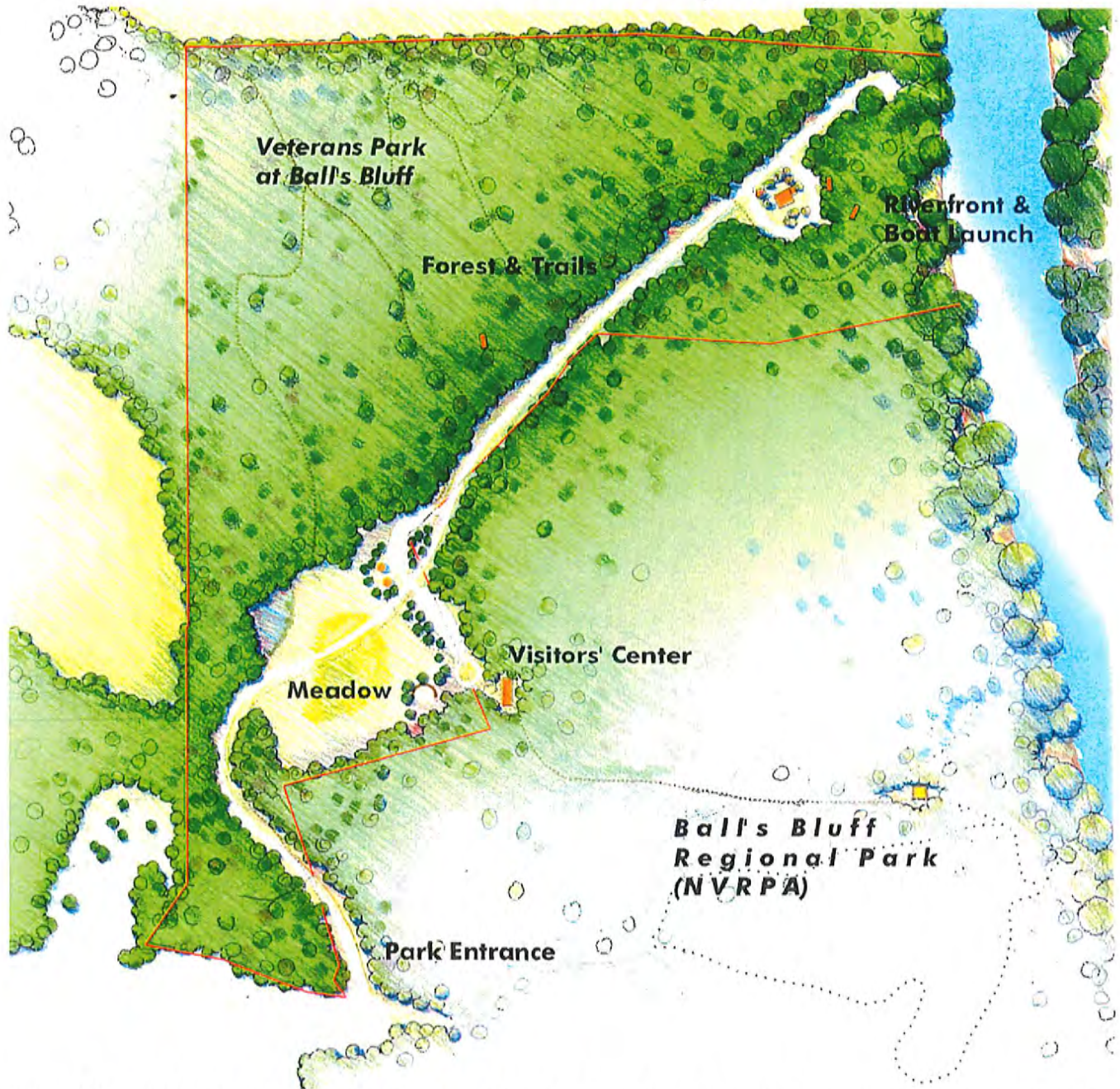


Figure 33b: The Master Plan, Illustrative Plan. See Figure 33a for labeling of specific project components. See Figures 33c & 33d for individual project areas.

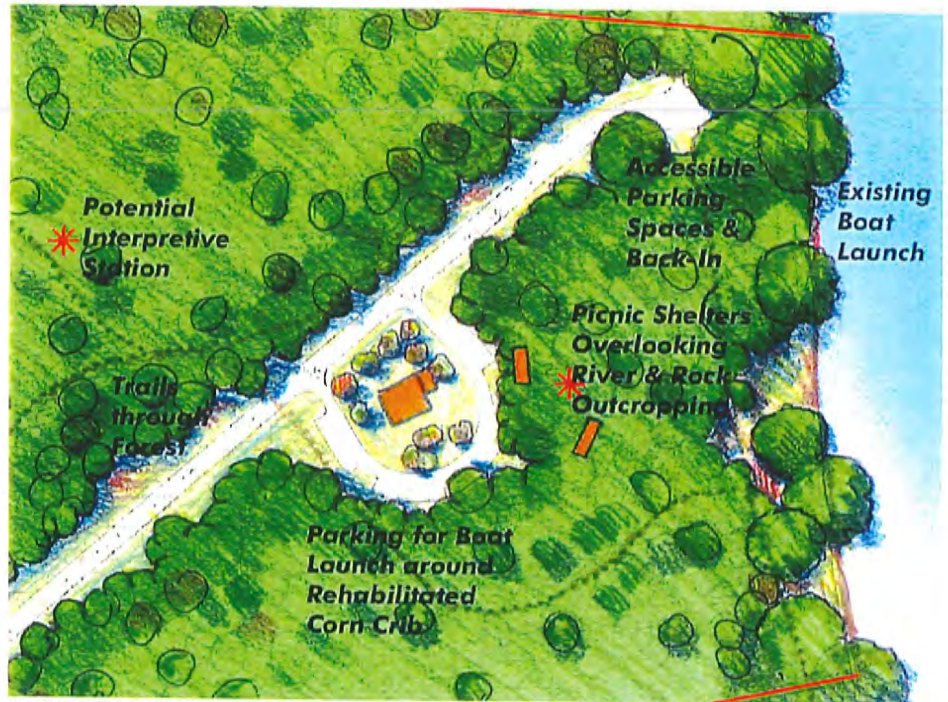


Figure 33c: Illustrative Plan Inset of the Boat Launch and Corn Crib area.

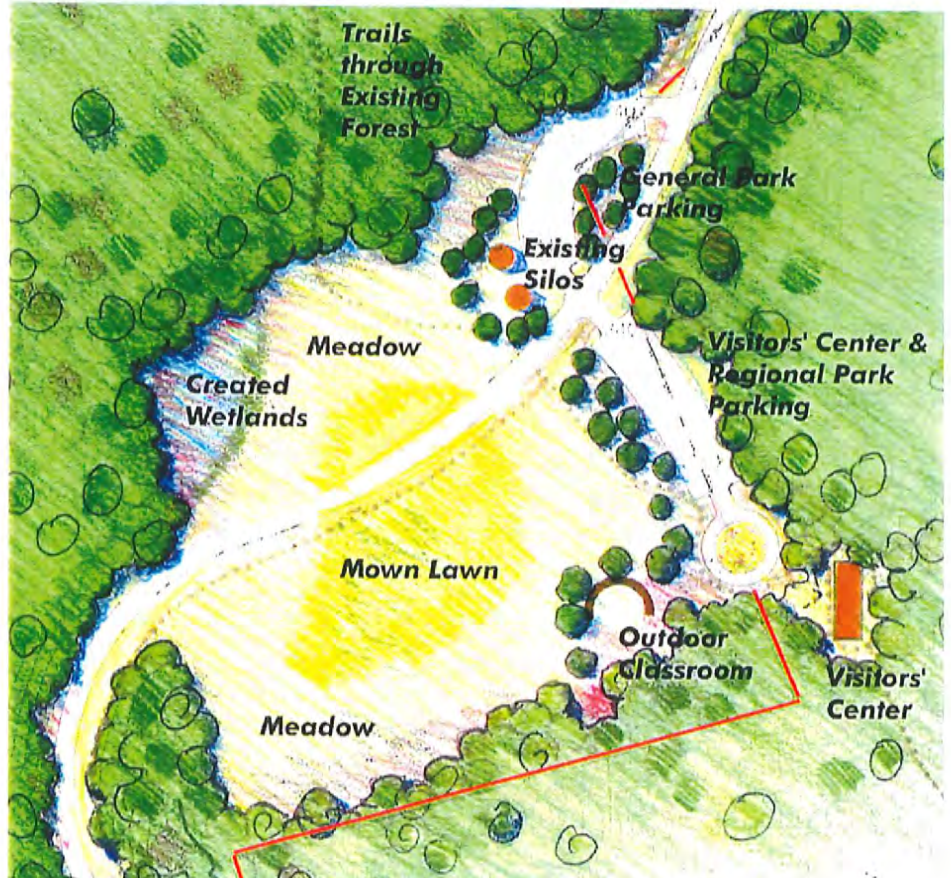


Figure 33d: Illustrative Plan Inset of the Meadow and Visitors' Center area.

spaces nearby. The lawn areas could be graded and mown to provide use areas for passive recreation or spontaneous play. The meadow areas would be mown approximately once annually to maintain open space.

The remainder of Zones 3 and 4 would remain forested with trails, interpretive areas, picnic facilities, and parking, as required. Zones 6 and 5 contain a boat launch area and parking facility near the existing corn crib, respectively.

SPECIFIC PLAN ELEMENTS

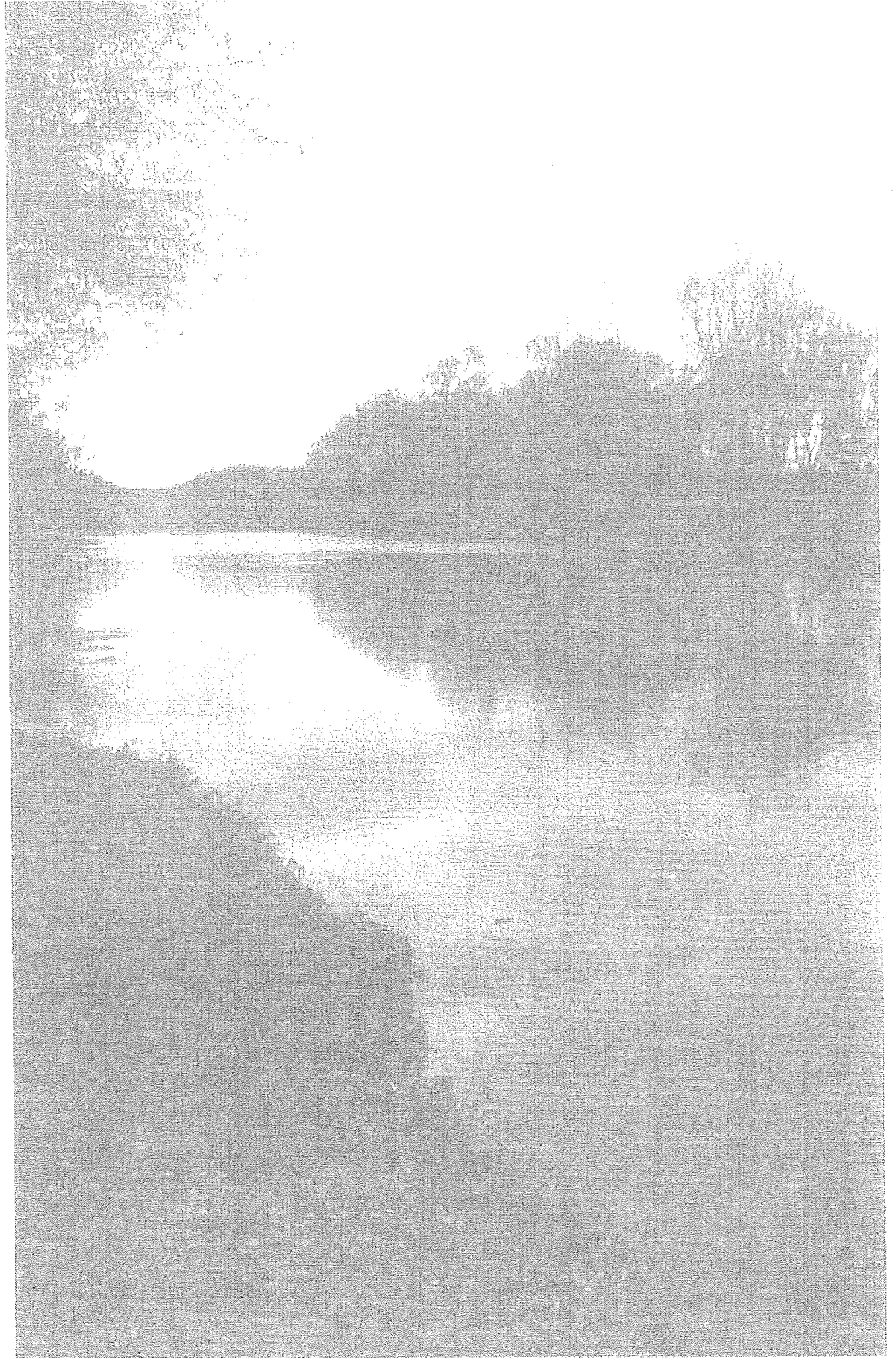
The specific elements of the plan are listed below and are located on the site as illustrated in Figure 33a.

1. Access road from Ball's Bluff Road into park.
2. Trail along access road.
3. Meadow.
4. Outdoor classroom.
5. Nature center, Civil War cemetery visitors center
6. Trail connection between Ball's Bluff Regional Park and Veterans Park at Ball's Bluff.
7. Existing Civil War cemetery.
8. Existing unpaved trails to remain in Ball's Bluff Regional Park.
9. Existing parking to be removed by NVRPA in Ball's Bluff Regional Park.
10. Existing road to be limited to maintenance traffic by NVRPA in Ball's Bluff Regional Park.
11. Parking for forty (40) cars and access to nature center and Civil War cemetery visitors center.
12. Existing forest to remain and to be protected.
13. Parking for thirty (30) cars for general park access.
14. Existing silos to remain and to be converted to restroom facilities.
15. Trail connection between nature center / visitors center and Veterans Park at Ball's Bluff.
16. Unpaved trails.
17. Interpretive area / scenic viewpoint along trail.
18. Potential trail connection to Loudoun County trail system and Potomac Heritage Trail.
19. Potential trail connection to Ball's Bluff Regional Park and Potomac Heritage Trail.
20. Access road along approximate alignment of existing road through property.
21. Created wetlands
22. Existing barn to be stabilized and rehabilitated for park uses.
23. Parking for boat ramp & picnic pavilion activities, including parking for up to thirty (30) vehicles.
24. Existing rock outcropping to be preserved.

26. Picnic pavilion, covered shelter with three to eight (3 - 8) picnic tables.
27. Existing boat ramp to be enhanced for public use. Access to be limited to non-motorized boats.
28. Existing floodplain area, including significant trees, to be preserved.
29. Potomac River.
30. Harrison Island, Maryland.

Note: All elements are proposed unless specifically noted as "Existing".

**IMPLEMENTATION
STRATEGIES**



IMPLEMENTATION STRATEGIES

DESCRIPTION OF IMPLEMENTATION STRATEGIES

The plan for Veterans Park at Ball's Bluff will be accomplished in phases, as described in detail below. The goal of the phasing is to create a park that will be useable by Leesburg residents as soon as possible, and to add program features over time to expand the site elements offered by the facility. The implementation of each phase of work will require (1) development of detailed design and obtaining of permits where needed; (2) development of construction drawings; (3) obtaining competitive construction bids and selecting the project contractor; and (4) construction.

In addition to the phasing plan, this section also contains estimated costs for each park element. It should be noted that, should an agreement be reached between the Town of Leesburg and the NVRPA with regard to sharing certain facilities (e.g., the road and the visitors'/nature center with accompanying parking), some measure of cost sharing for construction of these elements will need to be determined. At this time, however, an agreement between these entities has not been finalized.

PHASING

Construction of any improvements made to Veterans Park at Ball's Bluff will likely occur in phases. Phasing construction of this project will allow the Town of Leesburg to open portions of the park to the public at an earlier date than if the project were constructed in only one phase.

PHASE I

As citizens of the Town have expressed significant interest in riverfront access and picnicking facilities for this park, addition of these amenities will be the primary emphasis of Phase I construction. Construction of the roadway from the park entrance to the boat launch will require grading areas adjacent to the roadway; therefore, Phase I should include restoration of those areas via reforestation, meadow planting, or turf, as appropriate, as well as construction of vegetated swales alongside the roadway to manage roadway stormwater runoff. Major site utilities, including water and electrical connections, should occur during Phase I as well, as these utilities will require trenching alongside the roadway, which can be incorporated into the roadway construction schedule. Phase I will also include the beginning of a tree-planting program, a forest invasive species removal program, a site furnishing program, and an interpretive program. Each of these programs is scheduled to continue through Phase 3. Major park improvements to be constructed during Phase I include:

- The roadway from the park entrance to the riverfront & existing boat launch,
- One parking area near the existing silos,
- Covered pavilions with picnic tables, and
- Trails from the park entrance to the riverfront and boat launch.

In addition, several studies related to permit acquisition will be begun in Phase I. The first should be a wetland delineation. Prior to submitting an Army Corps of Engineers permit application for authorization to fill waters of the U.S., a detailed jurisdictional delineation and Corps' confirmation is necessary. Upon completion of the wetland delineation, a letter requesting the Corps' onsite visit should be submitted with all pertinent documents related to the delineation. With the Corps' verbal confirmation of the jurisdictional delineation, it is then necessary to have a survey crew field locate all jurisdictional areas. The surveyed data is then overlaid on top of the site plan to calculate total acreage of impacted jurisdictional areas. Required compensatory mitigation for these impacts can then be determined. The Corps requires that mitigation be first considered onsite; and one possible mitigation area is included in the plan. If it is shown that onsite mitigation is not feasible, an offsite location may be proposed. The investigation of potential mitigation sites on the property would be another task that would be included as part of the permit application process.

In the environmental assessment carried out for this master plan, a wetland walkover was conducted on only part of the property shown on the site plan. A detailed delineation will need to be conducted on this parcel as well as on the NVPRA property. Given the nature of the development of the proposed park site, this delineation would be performed only in those areas where impacts are likely.

A Phase I archaeological test of the areas to be disturbed by construction, including grading or cutting, should also take place at this time. This analysis will be important in terms of avoiding unintentional adverse effects to any archaeological resources that may be present on the site. Any archaeological evidence found would be documented, with a strategy for protection and possible interpretation determined at that time.

The use of the existing boat ramp at the edge of the Potomac River, as shown in the proposed park program, will not require any improvements or alterations that would required dredge or fill activities below the normal water surface elevation. Therefore, no permits would be required.

Per Town of Leesburg ordinance, any trees 18" dbh or greater within the proposed area of disturbance must be documented prior to site plan submittal.

This documentation should occur during each phase of design and construction.

In addition, at each phase of design and construction, grading permits will be required through submission of construction documents indicating limits of clearing as well as grading, and erosion and sediment control measures. Given that the vehicular circulation for the park will consist of asphalt roads and parking, stormwater management facilities will probably also be required. All permitting for grading, erosion and sediment control, and stormwater management for this property will be based on county standards, and would be submitted to the Town for both Town and County review and approval.

Soil percolation testing for onsite septic disposal systems must be conducted for the proposed restroom facilities. A septic disposal area must be approved prior to receipt of a grading permit. The Town of Leesburg allows on-site septic disposal if the proposed facility is more than two hundred feet from any municipal sanitary sewer line. For on-site disposal, percolation testing and permitting is required and must be done through the Loudoun County Health Department. Part of the permit application must document the usage rate for the proposed facility, as square footage for a septic disposal field depends on usage. As the park site will be supplied with municipal water, permitting, testing, and construction of well facilities is not necessary.

Finally, a Virginia Pollution Discharge Elimination System (VPDES) Permit from the Virginia Department of Environmental Quality will be required during all construction phases of the project. This permit requires inspection of all erosion and sediment control measures by a licensed land disturber. The inspections are generally conducted every two weeks, or after a 0.5-inch rainfall event. The VPDES permit is for five years or when the project is finished, whichever comes first.

PHASE 2

Phase 2 addresses park improvements that follow those initiated during Phase 1. Restrooms will be added during this phase, as well as trails in the northwest portion of the site. Phase 2 also involves continuation of the tree planting, invasive species removal, site furnishing, and interpretive programs begun during Phase 1. Major park improvements to be constructed during Phase 2 include:

- Restrooms, in the existing silos or built in the location of the existing silos,
- Trails in the northwestern portion of the park,
- Covered pavilions with picnic tables, and
- Rehabilitation and adaptive reuse of the existing corn crib.

PHASE 3

Completion of this phase will mark completion of all improvements recommended as part of this Master Plan. The primary focus of Phase 3 will be construction of the visitors' center and associated amenities. Because the sources and amounts of funding, the program and the design of the visitors' center have not yet been determined, this facility is included in the last phase, to allow time for the Town and NVRPA to determine these elements. Phase 3 will also include completion of the tree planting, invasive species removal, site furnishing, and interpretive programs begun during Phases 1 and 2. Major park improvements to be constructed during Phase 3 include:

- Visitors' center,
- Outdoor classroom adjacent to visitors' center,
- Parking area adjacent to visitors' center,
- Trails connecting the visitors' center to the Ball's Bluff Regional Park (NVRPA), and
- Covered pavilions with picnic tables.

COST ESTIMATES

A conceptual level cost estimate has been prepared as part of this Master Plan. The intent of this cost estimate is to establish budget amounts for each of the three phases, based on probable design, construction, and project administration costs.

MASTER PLAN COST ESTIMATES SUMMARY

Phase 1	\$3,654,600
Phase 2	\$1,035,500
Phase 3	\$3,068,400
TOTAL PROJECT COSTS	\$7,758,500

PHASE I SUMMARY

Erosion & Sediment Control	10% of Earthwork Total	\$107,300
Demolition		\$46,667
Site Preparation		\$119,818
Earthwork		\$1,073,000
Water & Septic Utilities		\$43,000
Paving & Surfacing		\$335,772
Stormwater Management & Created Wetlands		\$147,366
Site Improvements		\$58,500
Plantings		\$278,667
Masonry		\$35,750
Buildings		\$255,000
Electrical		\$80,000
Subtotal:		\$2,580,900
Direct Costs		\$2,580,900
General Conditions	8%	\$206,500
Design Contingencies	10%	\$258,100
NET CONSTRUCTION COSTS		\$3,045,500
Construction Contingencies	10%	\$304,550
GROSS CONSTRUCTION COST		\$3,350,050
Design Services*	10% of NET	\$304,550
TOTAL PHASE COSTS		\$3,654,600

PHASE 2 SUMMARY

Erosion & Sediment Control	10% of Earthwork Total	\$0
Demolition		\$0
Site Preparation		\$37,180
Earthwork		\$0
Water & Septic Utilities		\$18,000
Paving & Surfacing		\$12,060
Stormwater Management & Created Wetlands		\$0
Site Improvements		\$99,500
Plantings		\$52,000
Masonry		\$8,250
Buildings		\$470,000
Electrical		\$5,000
Subtotal:		\$702,000
Direct Costs		\$702,000
General Conditions	8%	\$56,200
Design Contingencies	10%	\$70,200
NET CONSTRUCTION COSTS		\$828,400
Construction Contingencies	10%	\$82,840
GROSS CONSTRUCTION COST		\$911,240
Design Services*	15% of NET	\$124,260
TOTAL PHASE COSTS		\$1,035,500

PHASE 3 SUMMARY

Erosion & Sediment Control	10% of Earthwork Total	\$11,100
Demolition		\$0
Site Preparation		\$41,700
Earthwork		\$110,556
Water & Septic Utilities		\$18,000
Paving & Surfacing		\$74,972
Stormwater Management & Created Wetlands		\$19,400
Site Improvements		\$50,500
Plantings		\$79,111
Masonry		\$16,500
Buildings		\$1,740,000
Electrical		\$5,000
Subtotal:		\$2,166,900
Direct Costs		\$2,166,900
General Conditions	8%	\$173,400
Design Contingencies	10%	\$216,700
NET CONSTRUCTION COSTS		\$2,557,000
Construction Contingencies	10%	\$255,700
GROSS CONSTRUCTION COST		\$2,812,700
Design Services*	10% of NET	\$255,700
TOTAL PHASE COSTS		\$3,068,400

** Design Services includes the professional services provided by landscape architects, architects, civil engineers, jurisdictional wetland delineators, geotechnical engineers, archaeologists, electrical engineers, mechanical engineers, structural engineers, interpretive and graphic designers, cost estimators, and other incidental professional services.*

Master Plan Cost Estimate

Item	Unit	Qty	Unit Cost	Item Cost	Phase 1	Phase 2	Phase 3
Demolition							
Existing trailer removal	ALLOW	1	\$5,000.00	\$5,000	\$5,000		
Existing utility removal - area of trailer	ALLOW	1	\$5,000.00	\$5,000	\$5,000		
Existing roadway removal and restoration - west property line to new roadway alignment (1000 LF)	SY	3333	\$11.00	\$36,667	\$36,667		
				Subtotal:	\$46,667	\$0	\$0
Site Preparation							
Clearing & Grubbing - park entrance to visitors' center	AC	2.7	\$11,400.00	\$31,150	\$31,150		
Clearing & Grubbing - visitors' center to boat launch	AC	4.8	\$11,400.00	\$54,570	\$54,570		
Clearing & Grubbing - visitors' center & outdoor classroom	AC	0.9	\$11,400.00	\$10,340			\$10,340
Selective clearing & invasive species removal - parkwide	AC	15	\$2,000.00	\$30,000	\$30,000	\$30,000	\$30,000
Tree Removal (18+" dbh) (allowance)	EA	5	\$750.00	\$4,098	\$4,098		
Tree Removal (18+" dbh) (allowance)	EA	10	\$750.00	\$7,180		\$7,180	
Tree Removal (18+" dbh) (allowance)	EA	2	\$750.00	\$1,360			\$1,360
				Subtotal:	\$119,818	\$37,180	\$41,700
Earthwork							
Rough grading - roadway & adjacent areas - park entrance to visitors' center	CY	96333	\$4.00	\$385,333	\$385,333		
Rough grading - roadway & adjacent areas - visitors' center to boat launch	CY	91667	\$4.00	\$366,667	\$366,667		
Rough grading - visitors' center & adjacent parking area	CY	12778	\$4.00	\$51,111			\$51,111
Rough grading - outdoor classroom	SY	1778	\$4.00	\$7,111			\$7,111
Roadway base course - park entrance to visitors' center	SY	5000	\$9.00	\$45,000	\$45,000		
Roadway base course - visitors' center to boat launch	SY	7111	\$9.00	\$64,000	\$64,000		
Roadway base course - general parking area	SY	1889	\$9.00	\$17,000	\$17,000		
Roadway base course - visitors' center parking	SY	2444	\$9.00	\$22,000			\$22,000
Roadway base course - boat launch parking area	SY	1667	\$9.00	\$15,000	\$15,000		
Fine grading & 4" topsoil - adjacent to roadway - entrance to visitors' center	SY	21667	\$3.00	\$65,000	\$65,000		
Fine grading & 4" topsoil - adjacent to roadway - visitors' center to boat launch	SY	35000	\$3.00	\$105,000	\$105,000		
Fine grading & 4" topsoil - adjacent to visitors' center	SY	6778	\$3.00	\$20,333			\$20,333
Rock excavation	ALLOW	1	\$10,000.00	\$10,000	\$10,000		\$10,000
				Subtotal:	\$1,073,000	\$0	\$110,556
Note: Earthwork estimate does not include significant rock excavation. Geotechnical work is required to determine extent and estimated amount of rock excavation required.							
Water & Septic Utilities							
Site water connection	ALLOW	1	\$10,000.00	\$10,000	\$10,000		
Site 4" water line from park entrance to restroom building & visitors' center	LF	1650	\$20.00	\$33,000	\$33,000		
Site septic facility	ALLOW	1	\$8,000	\$8,000		\$8,000	\$8,000
Visitors' center connection to septic facility (allowance)	LF	500	\$20	\$10,000			\$10,000
Restroom (silo) connection to septic facility (allowance)	LF	500	\$20	\$10,000		\$10,000	
				Subtotal:	\$43,000	\$18,000	\$18,000

Paving & Surfacing

Roadway asphalt surface - park entrance to visitors' center	SY 4778	\$17.50	\$83,611	\$83,611		
Roadway asphalt surface - visitors' center to boat launch	SY 7111	\$17.50	\$124,444	\$124,444		
Roadway asphalt surface - general parking area	SY 2000	\$17.50	\$35,000	\$35,000		
Roadway asphalt surface - visitors' center parking area	SY 2556	\$17.50	\$44,722			\$44,722
Roadway asphalt surface - boat launch parking area	SY 1667	\$17.50	\$29,167	\$29,167		
Curbing, concrete - general parking area	LF 780	\$20.00	\$15,600	\$15,600		
Curbing, concrete - visitors' center parking area	LF 950	\$20.00	\$19,000			\$19,000
Curbing, concrete - boat launch parking area	LF 1250	\$20.00	\$25,000	\$25,000		
Trails - 6' unpaved surface - park entrance to visitors' center	LF 1650	\$2.00	\$3,300	\$3,300		
Trails - 6' unpaved surface - visitors' center to boat launch	LF 2100	\$2.00	\$4,200	\$4,200		
Trails - 6' unpaved surface - northwest portion of park	LF 6030	\$2.00	\$12,060		\$12,060	
Trails - 6' asphalt surface - adjacent to visitors' center	LF 750	\$15.00	\$11,250			\$11,250
Trails - 6' asphalt surface - adjacent to general parking area	LF 430	\$15.00	\$6,450	\$6,450		
Trails - 6' asphalt surface - adjacent to boat launch parking area	LF 600	\$15.00	\$9,000	\$9,000		
			Subtotal: \$335,772		\$12,060	\$74,972

Stormwater Management & Created Wetlands

Vegetated swale along roadway - average 8' width - park entrance to visitors' center	LF 3300	\$12.00	\$39,600	\$39,600		
Vegetated swale along roadway - average 8' width - visitors' center to boat launch	LF 2098	\$12.00	\$25,176	\$25,176		
Vegetated swale - average 8' width - general parking area	LF 780	\$12.00	\$9,360	\$9,360		
Vegetated swale - average 8' width - boat launch parking	LF 1250	\$12.00	\$15,000	\$15,000		
Vegetated swale - average 8' width - visitors' center parking	LF 950	\$12.00	\$11,400			\$11,400
Stormwater Basin near visitors' center	SF 300	\$30.00	\$9,000	\$9,000		
Conventional storm drain system	ALLOW 1	\$8,000.00	\$8,000	\$8,000		
Conventional storm drain system	ALLOW 1	\$8,000.00	\$8,000			\$8,000
Constructed wetlands	SY 4581	\$9.00	\$41,230	\$41,230		
			Subtotal: \$147,366		\$0	\$19,400

Site Improvements

Benches (6' - 8', wooden or recycled) (Allowance)	EA 20	\$900.00	\$18,000	\$18,000	\$18,000	\$18,000
Trash receptacle (Allowance)	EA 5	\$500.00	\$2,500	\$2,500	\$2,500	\$2,500
Park entrance sign	ALLOW 1	\$5,000.00	\$5,000	\$5,000		
Park entrance feature	ALLOW 1	\$50,000.00	\$50,000		\$50,000	
Directional / parking signage	ALLOW 1	\$4,000.00	\$4,000	\$4,000		
Directional / parking signage	ALLOW 1	\$1,000.00	\$1,000			\$1,000
Interpretive signage along trails	ALLOW 1	\$5,000.00	\$5,000	\$5,000	\$5,000	\$5,000
Picnic tables (Allowance) (6 per pavilion)	EA 24	\$1,000.00	\$24,000	\$24,000	\$24,000	\$24,000
			Subtotal: \$58,500		\$99,500	\$50,500

Plantings

Planted riverbank stabilization	ALLOW 1	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
Land reclamation - native plants (50% of disturbed areas adjacent to roadways & parking) park entrance to visitors' center	SY 10833	\$5.00	\$54,167	\$54,167		
Land reclamation - native plants (50% of disturbed areas adjacent to roadways & parking) visitors' center to boat launch	SY 17500	\$5.00	\$87,500	\$87,500		
Land reclamation - native plants (50% of disturbed areas adjacent to roadways & parking) adjacent to visitors' center & outdoor classroom	SY 3389	\$5.00	\$16,944			\$16,944
Seeded lawn (50% of disturbed areas adjacent to roadways & parking) park entrance to visitors' center	SY 10833	\$3.00	\$32,500	\$32,500		
Seeded lawn (50% of disturbed areas adjacent to roadways & parking) visitors' center to boat launch	SY 17500	\$3.00	\$52,500	\$52,500		
Seeded lawn (50% of disturbed areas adjacent to roadways & parking) adjacent to visitors' center & outdoor classroom	SY 3389	\$3.00	\$10,167			\$10,167
Trees - 2" caliper - deciduous (allowance)	EA 40	\$600.00	\$24,000	\$24,000	\$24,000	\$24,000
Trees - 4" caliper - deciduous (allowance)	EA 20	\$1,000.00	\$20,000	\$20,000	\$20,000	\$20,000
			Subtotal: \$278,667		\$52,000	\$79,111

Masonry

Rock ledge (use of existing / relocated boulders for grade change) adjacent to roadway - park entrance to visitors' center (allowance)	LF	250	\$55.00	\$13,750	\$13,750		
Rock ledge (use of existing / relocated boulders for grade change) adjacent to roadway - visitors' center to boat launch (allowance)	LF	250	\$55.00	\$13,750	\$13,750		
Rock ledge (use of existing / relocated boulders for grade change) adjacent to visitors' center (allowance)	LF	150	\$55.00	\$8,250			\$8,250
Rock ledge (use of existing / relocated boulders for grade change) adjacent to picnic pavilion (allowance)	LF	150	\$55.00	\$8,250	\$8,250	\$8,250	\$8,250
				Subtotal:	\$35,750	\$8,250	\$16,500

Buildings

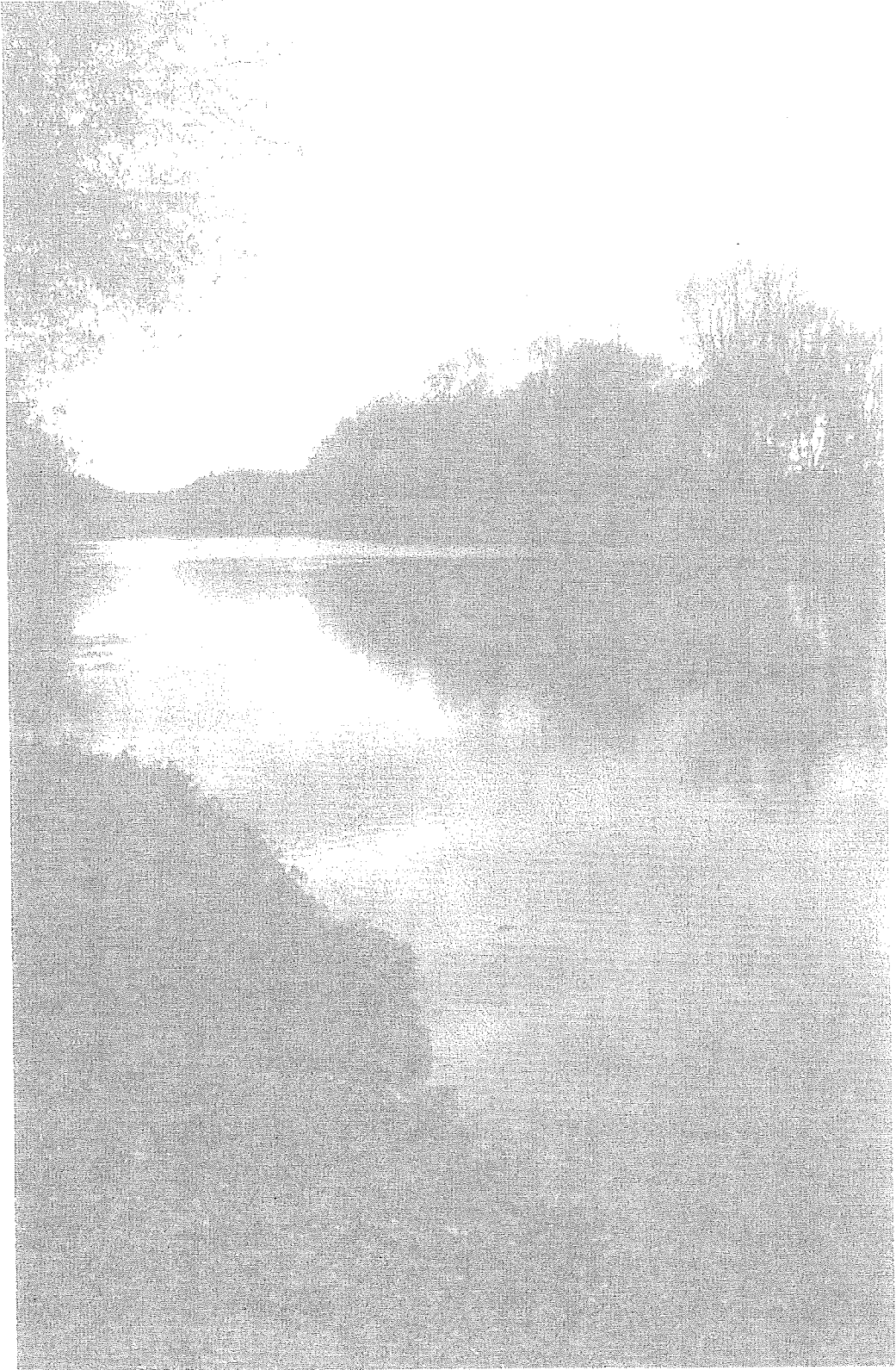
Stabilize existing corn crib	ALLOW	I	\$15,000.00	\$15,000	\$15,000		
Adaptively reuse corn crib (limited applications) (program undetermined)	ALLOW	I	\$30,000.00	\$30,000		\$30,000	
Picnic shelter - open air structure, conc. slab w/ roof, 30' x 50' (stick-built or prefab)	EA	4	\$60,000.00	\$240,000	\$240,000	\$240,000	\$240,000
Restroom facility (converted silos)	ALLOW	I	\$200,000.00	\$200,000		\$200,000	
Visitors' center (design to budget number)	ALLOW	I	\$1,000,000.00	\$1,000,000			\$1,500,000
				Subtotal:	\$255,000	\$470,000	\$1,740,000

Electrical

Site electrical connection & meter	ALLOW	I	\$15,000.00	\$15,000	\$15,000		
Site electrical conduit along roadway - park entrance to visitors' center	LF	1650	\$16.00	\$26,400	\$26,400		
Site electrical conduit along roadway - visitors' center to boat launch	LF	2100	\$16.00	\$33,600	\$33,600		
Security lighting	ALLOW	I	\$3,000.00	\$3,000	\$5,000	\$5,000	\$5,000
				Subtotal:	\$80,000	\$5,000	\$5,000

SUBTOTAL: \$2.47 M \$702 K \$2.16M

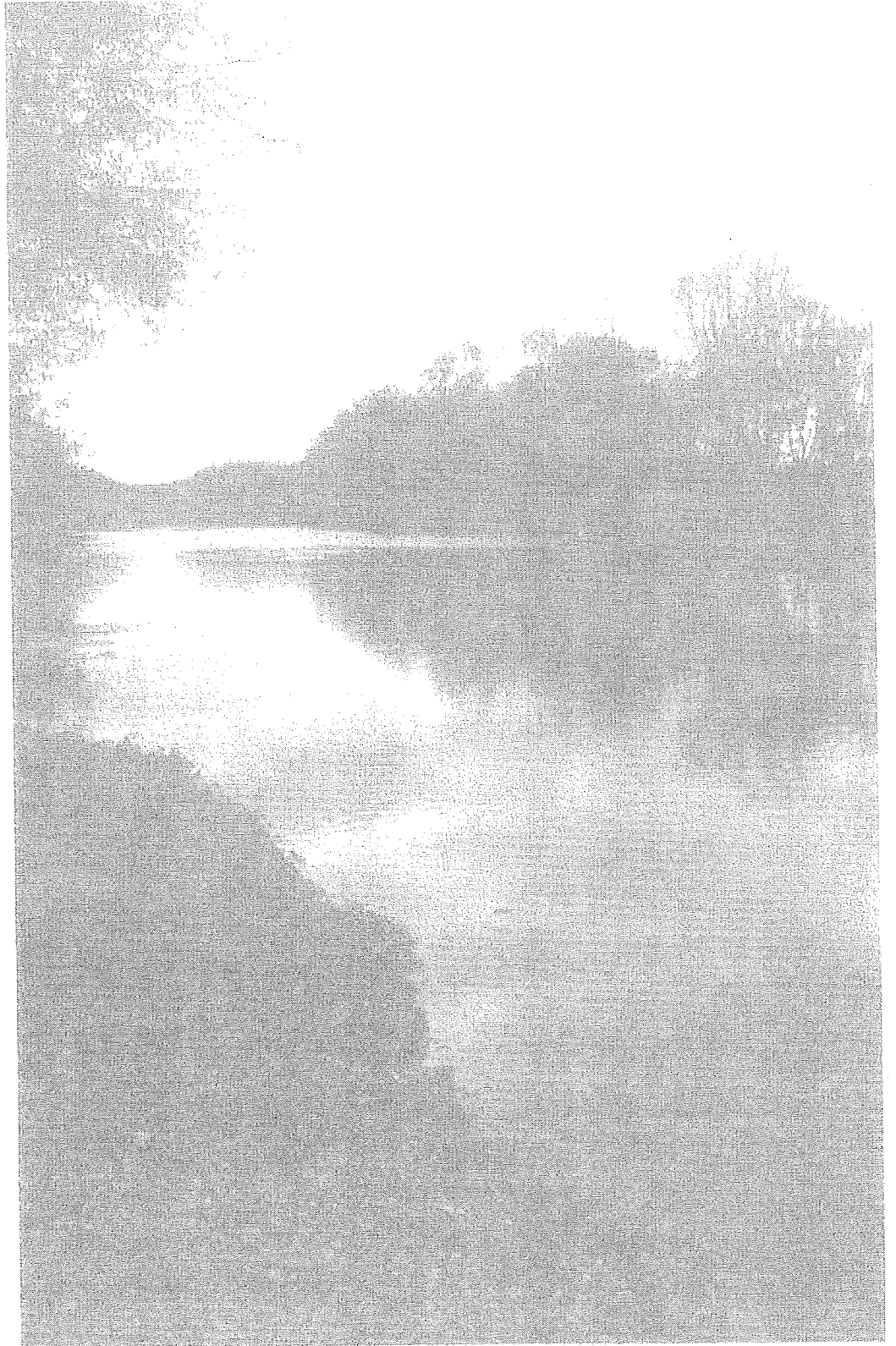
CONCLUSIONS



CONCLUSIONS Veterans Park at Ball's Bluff, adjacent to one of Virginia's premier historic resources, presents the Town of Leesburg with a wonderful opportunity. It not only provides residents with a beautiful park site along the Potomac River, with access to the River for recreational activities; but it also preserves a special natural and historic part of the Town for passive recreational enjoyment by present and future Town residents. In addition, it provides an opportunity to educate the public — both children and adults — on the environmental and cultural significance of the area.

While all the amenities offered by the park may not be available in the short-term future, the site can still be enjoyed as a place in which to walk, bring a picnic, put one's canoe in the water, and enjoy the natural setting. It will be a park that only grows better over time, and it will become an important part of Leesburg's open space heritage.

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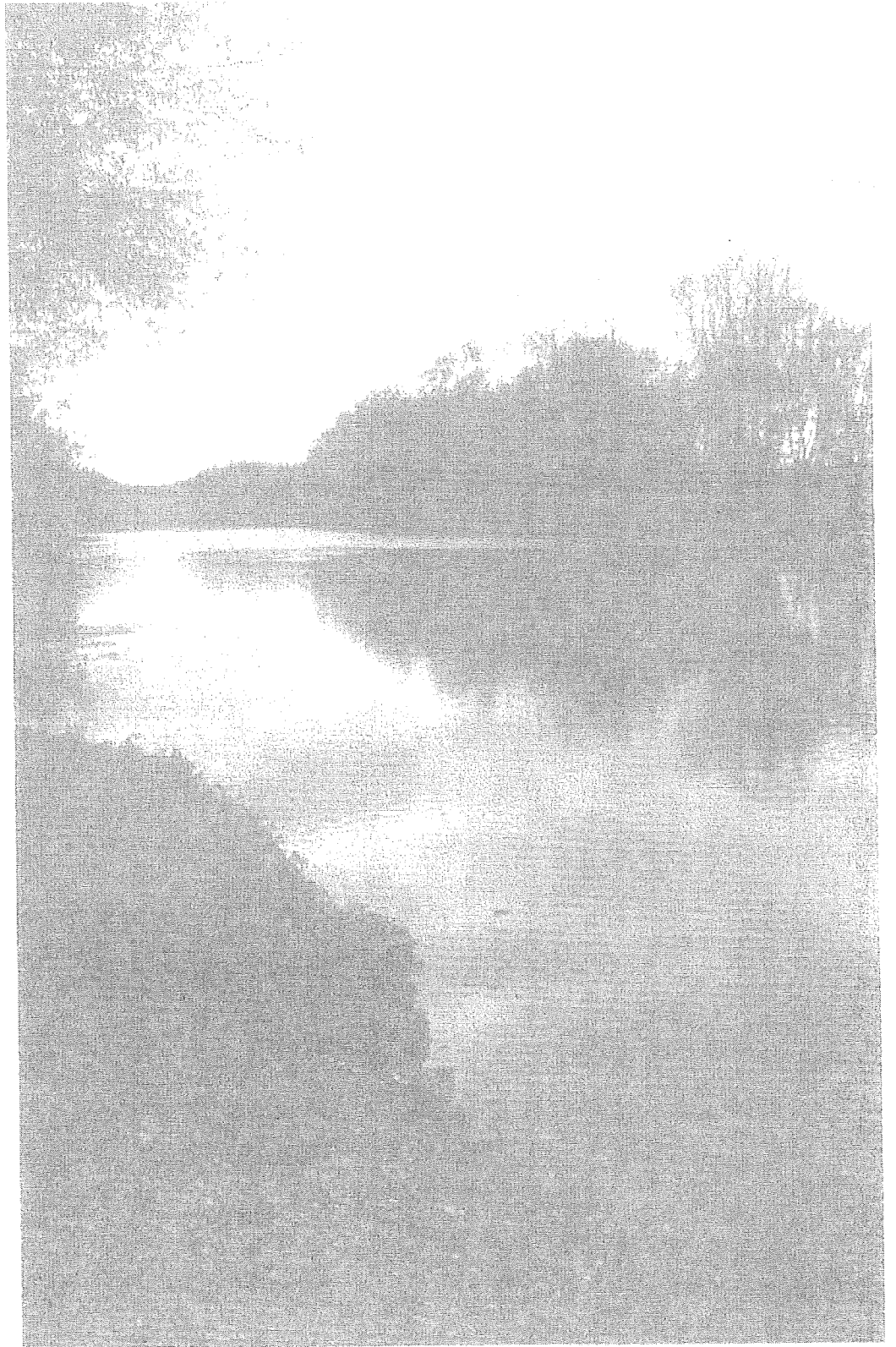
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APPENDICES



APPENDIX 'A' OUTLINE

CULTURAL RESOURCES ASSESSMENT

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II. RESEARCH DESIGN

III. SITE CONDITIONS

IV. PREVIOUS INVESTIGATIONS

V. CULTURAL CONTEXT

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VI. ARCHAEOLOGICAL RESOURCE POTENTIAL

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I. INTRODUCTION

In March 2001, Cultural Resources, Inc. (CRI) conducted a cultural resources assessment of the proposed Veterans Park at Ball's Bluff in eastern Loudoun County, Virginia (Figure 1). The study area consisted of approximately 85 acres, bounded to the east by the Potomac River and to the south by the Ball's Bluff Battlefield and Regional Park property. The study area is situated approximately 0.6 mile east of the intersection of the U.S. Route 15 Bypass and Ball's Bluff Road. The Town of Leesburg currently plans to develop the property for recreational use.

The goal of the cultural resources assessment was to gather information concerning known resources on the property, and to employ documentary research, previous archaeological investigations, and an examination of current site conditions to define those portions of the study area with the greatest potential for the presence of previously unidentified cultural resources. In order to accomplish these goals, CRI conducted documentary research at the archives of the Virginia Department of Historic Resources (VDHR), the Thomas Balch Library, the Library of Virginia, the Virginia Historical Society, the Simpson Library of Mary Washington College, and the Central Rappahannock Regional Library. In addition, CRI conducted a pedestrian survey of the 85-acre property and conducted judgmental shovel testing to evaluate site conditions and assess the potential for archaeological resources.

The assessment was researched and written by Dr. Matthew R. Laird, CRI Research and Publications Group Manager. Laird conducted the pedestrian survey of the property with the assistance of Jennifer Brown. Report graphics were prepared by Justin Atkins.

II. RESEARCH DESIGN

The purpose of the cultural resources assessment was to:

- Document all previously identified archaeological and architectural resources within the study area and its vicinity.
- Develop a cultural context based on documentary and cartographic research to identify the nature and extent of historic settlement and military activity within the study area.
- Identify areas within the study area with the highest probability for containing archaeological resources based on previous investigations in the area, predictive models for prehistoric and historic settlement

patterns, and the results of a pedestrian survey of the property.

III. SITE CONDITIONS

The majority of the study area is wooded, though the southwest portion of the property is in open pasture. The study area is characterized by moderately steep and steep topography, with elevations ranging between 190 and 350 feet above mean sea level.

The property is situated in the Culpeper basin, within the Piedmont Physiographic Province. The basin, which extends from the Rapidan River north into Maryland, consists of several layers of sedimentary rocks including sandstones, shales, siltstones, and conglomerates. Upland areas are typically covered with a layer of partially weathered rock (saprolite), while stream valleys are characterized by alluvium. Rock outcrops are most common along stream valleys (WEG 2000).

An unpaved gravel road traverses the study area diagonally, running southwest-northeast, and linking a ford on the Potomac River with Ball's Bluff Road. Eight standing structures are present on the property, the majority of which are located in the pasture area in the southwest portion of the tract. They include a mobile trailer, detached garage, goat pen, two metal silos, and a storage lean-to. A barn/corn-crib and associated shed are located along the gravel road approximately 500 feet from the Potomac River.

IV. PREVIOUS INVESTIGATIONS

A records search at the archives of the VDHR indicated that no archaeological sites had been previously identified within the study area, and only four have been inventoried within a one-mile radius (Figure 2). The identified sites in the vicinity include three Late Archaic/Late Woodland prehistoric Native American sites, and the archaeological remains associated with the ca. 1790 Exeter Plantation, which is listed on the National Register of Historic Places.

TABLE I. **PREVIOUSLY IDENTIFIED ARCHAEOLOGICAL SITES WITHIN A ONE-MILE RADIUS OF THE STUDY AREA.**

<u>Site</u>	<u>Type</u>	<u>Association</u>
44LD344	Lithic scatter	Late Archaic
44LD345	Lithic scatter	Late Archaic/Late Woodland
44LD346	Lithic scatter	Late Archaic
44LD364	Historic Domestic: Exeter Plantation	Late 18 th -19 th c.

No previously identified architectural resources are situated within the bounds of the study area, though the entire property is encompassed by the core area of the Ball's Bluff Battlefield (#053-5058) as defined by the Civil War Sites Advisory Committee (Figure 3). An additional ten architectural resources are located within a one-mile radius of the study area, including a natural spring, the Ball's Bluff Battlefield and National Cemetery (a National Historic Landmark) administered by the Northern Virginia Regional Park Authority (#253-5021), and a number of nineteenth- and early twentieth-century homes and farms.

TABLE 2. PREVIOUSLY IDENTIFIED ARCHITECTURAL RESOURCES WITHIN A ONE-MILE RADIUS OF THE STUDY AREA.

<u>Resource #</u>	<u>Description</u>	<u>Date</u>
053-0082	Black Walnut Island/Harrison's Island House	Early 19 th c.
053-0255	Big Spring: natural water source	N/A
053-0297	Wynkoop/Fried House	1900-10
053-0298	Springwood House	1840-50
053-0289	Dry Hollow Farm	19 th c.
053-0299	Little Spring Farm	19 th c.
053-5058	Ball's Bluff Battlefield	1861
253-5014	Stone House	Late 19 th c.
253-5018	House, Rt. 15 Bypass (abandoned)	Early 19 th c.
253-5019	Exeter (National Register of Historic Places)	Ca. 1790
253-5021	Ball's Bluff Battlefield and National Cemetery (National Historic Landmark)	1861

V. CULTURAL CONTEXT

PREHISTORIC CONTEXT

Virginia's prehistoric cultural chronology is subdivided into three major time periods based on changes in subsistence as exhibited by material remains and settlement patterns. These divisions are known as the Paleoindian, Archaic, and Woodland periods. A brief summary of the regional cultural chronology follows, with comments on manifestations of each period within the greater vicinity of the study area.

Paleoindian (Prior to 8000 B.C.)

Paleoindian occupation in Virginia, the first human occupation of the region, began some time before 10,000 B.C. The earliest diagnostic artifacts about which there is any consensus of opinion are Clovis projectile points which are typically

fashioned of high quality cryptocrystalline materials such as chert, chalcedony, and jasper. Later Paleoindian points include smaller Clovis-like and Cumberland variants, small "Mid-Paleo" points and, at the late end of the Paleoindian continuum, Hardaway or Hardaway-Dalton points. Also diagnostic, though to a lesser extent, are certain types of well made endscrapers, sidescrapers, and other formalized tools. Most current views now hold that eastern Paleoindians were generalized foragers with an emphasis on hunting. Social organization apparently consisted of relatively small bands that exploited a wide but defined territory.

The majority of Paleoindian remains in Virginia are represented by isolated projectile point finds and what appear to be small temporary camps. Although some larger and very notable base camps are present in the state, they are relatively rare and usually associated with sources of preferred high quality lithic materials.

Predictions call for any Paleoindian remains in Loudoun County to be found in very low densities, with the most likely locations being situated along game-attracting marshes with southern and eastern aspects (Barber et al. 1992:42-43). The potential for such sites in the study area vicinity appears relatively low.

Archaic (8000 - 1200 B.C.)

The beginning of the Archaic Period generally coincided with the end of the Pleistocene epoch, marked in the region by a climatic shift from a moist, cool period to a warmer, dryer climate. Vegetation also changed at this time from a largely boreal forest setting to a mixed coniferous-deciduous forest. In eastern Virginia, a temperate climate was established and the formation of the Chesapeake estuary began (Dent 1995:147). Increasing differences in seasonal availability of resources brought on by post-Pleistocene changes are thought to coincide with increasing emphasis on strategies of seasonally geared mobility.

Archaic populations, it is believed, were characterized primarily by a band-level social organization involving seasonal movements corresponding to the seasonal availability of resources and, in some instances, shorter-interval movements. Settlement during the Archaic Period probably involved the occupation of relatively large regions by single band-sized groups living in base camps during part of the year and dispersing as necessary on an as-needed or seasonal basis, creating smaller microband camps, possibly consisting of no more than single families.

The Archaic Period can be characterized by the development of more specialized resource procurement activities as well as the technology to accomplish these activities. These differences in the material culture are believed to reflect larger, more localized populations and changes in methods of food procurement and processing.

Based on the work of Barber et al. (1992), as well as studies of nearby northern Virginia counties, Archaic sites should be the most common types found in the study area environs as a whole, with Middle and Late Archaic sites dominating. Early and Middle Archaic sites are found on both the largest streams and on small headwater tributaries, indicating a movement from the major rivers to the interior headwaters and exploitation of a broad range of both riverine and forest resources (Barber et al. 1992:46-48).

Woodland (1200 B.C. – A.D. 1600)

The Woodland Period is characterized by ceramic technology, a gradually developing dependence on horticulture, and increased sedentism. Three subperiods (Early, Middle, and Late Woodland) have been designated, based primarily on stylistic and technological changes in ceramic and projectile point types as well as settlement patterns.

The temporal brackets for Early and Middle Woodland in Virginia are not agreed upon by all researchers. The southeastern chronology, with Early Woodland beginning ca. 1000 B.C. and continuing to ca. A.D. 200/300, as still used by some scholars, may be applicable to southwestern Virginia, but is inappropriate for the Piedmont, Coastal Plain, or Potomac-drained sections of the Ridge and Valley. The most widely used temporal scheme in the Middle Atlantic region at present (Early Woodland, ca. 1200 B.C.- ca. 500 B.C.; Middle Woodland, ca. 500 B.C. - ca. A.D. 900), and the one that is most applicable to the study area environs, was initially formulated by Gardner (1982) and elaborated on by others, based on both artifact styles and settlement shifts.

The Early Woodland Period, bracketed herein at ca. 1200 - 500 B.C., is generally defined by the appearance of ceramics in the archaeological record. The earliest Woodland ceramic wares, Marcey Creek Plain and variants, are rectangular or oval and resemble the preceding Late Archaic soapstone vessels. These are followed by cord-marked, soapstone-tempered Selden Island ceramics, sand-and-grit-tempered Accokeek ceramics, and in the upper part of the Potomac drainage, cord-marked and plain ceramics tempered with quartz, shale and other crushed rock (Gardner and Nash 1988; McLearn 1991).

Also characteristic of the Early Woodland period across a broad region of the east is complexity of and emphasis on ceremonial aspects, especially those concerned with the burial of the dead. In Virginia, this emphasis is not seen until about 500 B. C. when stone and earth burial cairns and cairn clusters occur in the Shenandoah Valley; however, this phenomenon did not extend into the Piedmont until much later when a second wave of burial mound ceremonialism occurs around the time of the Middle/Late Woodland transition, and accretional mounds are found in both the Ridge and Valley and Inner Piedmont provinces. However, mounds in the Piedmont appear to have been restricted to the Rivanna and Rapidan drainages.

By the Late Woodland Period (A.D. 900 - 1600), agriculture had assumed a role of major importance in the prehistoric subsistence system. The adoption of agriculture represents a major change in the prehistoric subsistence economy and settlement patterns. Expanses of arable land became a dominant settlement factor, and sites were located on fertile floodplain soils or, in many cases, on higher terraces or ridge adjacent to them.

Settlements dating to this time consist of both villages and small hamlets. Some villages were highly nucleated, while others were internally dispersed over a wide area. Some were completely fortified by circular or oval palisades, while others contained a fortified core area and outlying houses, indicating a rise in intergroup conflict. The more dispersed settlements were scattered over a wide area with indications of internally fluid settlement within a loosely defined town or village territory.

With the development of a more sedentary settlement-subsistence system culminating in the Late Woodland Period, permanent habitation sites gradually replaced base camp habitation sites more characteristic of those of the previous foragers and hunter-gatherers. Various supporting camps and activity areas were established in the day-to-day procurement of food and other resources (i.e., short-term hunting and foraging camps, quarries, butchering locations, and re-tooling locations). Locations used partially or largely for ceremonial purposes were also present, usually in association with habitation sites.

The large base camps, hamlets, and villages are typically located on bluffs, terraces or high floodplains adjacent to rivers or major tributaries. Small seasonal camps and non-seasonally based satellite camps supporting nearby sedentary villages and hamlets are located along smaller streams in the interior. These campsites are typically characterized by limited concentrations and sparse scatters of lithics and ceramics. Though a large village site would not be expected within the relatively narrow Potomac River floodplain portion of the study area, it is likely that smaller settlements or campsites associated with a larger village on

Harrison's Island may be present both within the floodplain and on the bluffs overlooking the river.

HISTORIC CONTEXT

The Early Development of Loudoun County, 1649-1800

The early history of the lands that encompass the study area was characterized by a larger struggle between the English Crown and its representatives, and the Virginia authorities, for jurisdiction over a vast portion of what is now northern Virginia. In 1649, the final year of his life, King Charles II granted a tract of five million acres between the Potomac and Rappahannock rivers to seven of his noble friends. The aristocratic owners of what was originally called the Northern Neck Proprietary were thus legally entitled to dispose of any of these lands not already occupied by settlers, encourage new settlement, and to collect rents and fees from their tenants. Eventually the entire Proprietary came under the authority of Thomas, Lord Culpeper, one of the original seven grantees. When his widow Margaret died in 1710, the land passed to her daughter, Lady Fairfax. She entrusted its management to Thomas Corbin, a powerful London merchant with connections to Virginia, who convinced her to lease the lands to Edmund Jennings (Geddes 1967: 9).

As early as 1660 Virginia's House of Burgesses voiced its growing hostility to the Proprietary, and for the next several decades both entities continued to claim jurisdiction over the lands, sometimes even granting the same tract to different individuals. When Lady Fairfax died in 1719 she left the Proprietary to her son Thomas, Sixth Lord Fairfax. Fairfax first visited Virginia in 1736 to resolve the longstanding dispute over the property. He succeeded, winning a claim to the most extensive definition of the Proprietary boundaries in exchange for certain concessions to the Virginia authorities. But while he was in Virginia arguing his case, Fairfax was so impressed with the colony that he resolved to return to live. After disposing of much of his property in England and Scotland, Fairfax moved to Virginia permanently in 1745 (Netherton et al. 1978: 6).

The study area was most likely patented during the 1730s as one of the large Northern Neck Land grants made to the colony's wealthy elite. As settlement of what was then western Fairfax County brought increasing numbers of land-hungry farmers to the area in the 1750s, the large original grants were then subdivided and sold. When Loudoun County was created from Fairfax in 1757, eastern Virginia was on the verge of an agricultural revolution. For more than a century tobacco had dominated the colonial economy. But years of intensive tobacco farming had left Tidewater soils badly depleted, and Virginia planters found it increasingly difficult to profit from the "noxious weed," particularly in the face of depressed foreign markets. So, by the time Loudoun County was

being settled in earnest by westward-moving farmers, grain crops were beginning to supplant tobacco as the staple of the agricultural economy (Poland 1976: 27).

In the years after the American Revolution, Loudoun County was dominated by farmers with relatively modest landholdings, who raised grain crops and livestock for export with the labor of a moderate number of slaves. Up to three quarters of landowners during this period held between 100 and 500 acres, while only 11 individuals claimed tracts of more than 1,000 acres. In fact, the period 1790 through 1820 in Loudoun County has been described as one of "demographic stability and agricultural reform" (Poland 1976: 26-27).

Progress and Prosperity, 1800-1861

Despite the obvious benefits of the transition from tobacco to grain crops, the farming methods of the late eighteenth and early nineteenth centuries continued to have a deleterious effect on exhausted soils. Under the traditional three-crop rotation system, a field first would be planted in corn, the following year in wheat, then left unplowed the third year to provide grazing for cattle and hogs. Recognizing the need for improved agricultural practices, Loudoun County farmer John A. Binns spearheaded the agricultural reform movement in Virginia. His 1803 *Treatise on Practical Farming*, which won the admiration of President Thomas Jefferson, outlined a formula for improving crop yields that would come to be known as the "Loudoun System." In his widely read book, Binns recommended deep plowing, the use of gypsum to restore soil productivity, and revising the old crop rotation pattern to include a third year of clover (Poland 1976: 84-88).

Binns' reforms were widely adopted throughout Virginia in the early years of the nineteenth century, with admirable results. By 1818, local farmer Robert Russell noted, most of his Loudoun County neighbors had abandoned shallow plowing and adopted the new farming practices. Binns himself commented on the markedly improved crop yields. "I do not think that the millers in the compass of ten miles, in the settlement where I live," he claimed, "will be able to manufacture much above one half; there are some in the settlement that will be obliged to desist from threshing, being unable to find room in the mills, or yet deposit any more in their granaries" (Poland 1976: 89).

Binns' self-promotion notwithstanding, it was clear that the general acceptance of agricultural reforms had a beneficial effect on Loudoun County farming in the first decades of the nineteenth century. But bumper crops were of little value if they could not be transported to market. At the repeated urging of Alexandria merchants, the Little River Turnpike was organized in 1802 to provide a reliable, economical route between the "breadbasket" of Loudoun County and the Potomac River port. Opened to traffic by 1806, the turnpike was one of the

first and most successful of Virginia's toll roads, offering farmers a paved road for a distance of 34 miles, from Aldie to Alexandria. The Little River Turnpike ultimately would become modern Route 50. And, by the early 1850s, the Leesburg & Aldie Turnpike Company had established a north-south route linking the important milling town of Aldie with Leesburg and the Little River Turnpike. Situated near the intersection of these two important transportation routes, the farmers living within the study area would have been able to send their grain crops to be milled, and then to market, with relative ease (Poland 1976: 115).

With a few notable exceptions, Loudoun County farmers typically did not own considerable numbers of slaves. Unlike older Tidewater counties, Loudoun had never been dominated by tobacco culture, a fact that had a profound effect on slave demography. Where tobacco had required a laborer for every three acres of tobacco under cultivation, a single slave could tend up to 20 acres of wheat. As such, Loudoun's black population never reached a majority of the population as in many parts of Tidewater. In fact, the black population remained relatively modest in the first quarter of the nineteenth century, fluctuating from 29 percent in 1790 to 40 percent in 1820. In general, Loudoun County farmers did not own large numbers of slaves simply because they did not need them in great numbers to work their farms. In 1810, for example, 878 individuals owned 5,001 slaves, an average of 5.7 slaves per owner. But this number can be deceptive. In reality, more than 60 percent of owners claimed fewer than 5 slaves (Poland 1976: 131-32).

The Battle of Ball's Bluff, October 21, 1861

As with other border regions, the Civil War found Loudouners with divided loyalties. Situated only 25 miles west of Washington, D.C., the county remained a contested area throughout the war, with both sides traversing the landscape on scouting and reconnaissance missions. Geographically, Loudoun invited military movement, with numerous fords across the Potomac River; agriculturally, the county's ample food stores attracted continual "hay-soldiering" (foraging for horses) and "pie-rooting" (feeding hungry soldiers) (Poland 1976: 183-84, 218-19).

After the First Battle of Bull Run in July 1861, the Confederate and Union armies had withdrawn, expecting no further campaigning until the following spring. Concerned about the Confederate presence in Leesburg, however, Union commander Major General George B. McClellan ordered General Charles P. Stone, stationed on the opposite side of the Potomac River in Maryland, to attempt a "slight demonstration" against the town to test the strength of the Confederate forces.

On the evening of October 20, 1861, General Stone ordered Colonel Charles Devens of the 15th Massachusetts Infantry to send a small reconnaissance party across the river to scout inland towards Leesburg. On the same night, Captain Chase Philbrick led a party of 15-20 men of Company H, 15th Massachusetts, across Ball's Bluff not far south of the ravine at the bluff's northern end (several hundred yards south of Smart's Mill Ford). Philbrick's small force proceeded up the bluff, and along a road through the woods, passing through the study area. In the distance the group saw what appeared to be a Confederate camp, though they could see no pickets or campfires. Returning to the Maryland side, Philbrick reported that the unguarded Confederate camp could likely be taken by the Federals. Armed with this information, Stone decided to send a stronger party the following day.

The following day, October 21st, would prove disastrous for the Federals. In the early morning hours, the Federal force crossed from Harrison's Island to the Virginia side at Ball's Bluff and further to the south at Edwards' Ferry. Colonel Devens led the 15th Massachusetts towards Leesburg, but met with Confederate skirmishers when they reached the house of Mrs. Jackson, which still stands just west of the southernmost portion of the study area.

The Massachusetts troops withdrew from the Jackson House and back towards a cleared area closer to the bluffs, on what is now the Ball's Bluff Park property owned by the Northern Virginia Regional Park Authority. After regrouping, Devens once again advanced with the 15th Massachusetts around mid-day, taking up a position near the Jackson House. In the third skirmish of the day, a Confederate force of about 700 men, including troops from the 8th Virginia, four Mississippi infantry companies, and three small detachments of Virginia cavalry, attacked the 15th Massachusetts, driving them back to the bluffs. In these opening skirmishes, it appears that the 15th Massachusetts may have advanced and withdrew through the extreme southwesternmost portion of the study area, situated to the south and east of the Jackson House (Holien 1985: 31, 42).

Following the retreat of the 15th Massachusetts, the two forces engaged in an open field near Ball's Bluff, with the Confederates succeeding in driving the Federals back to the river. Panic-stricken, the Union troops tried to cross the Potomac to safety, but many were drowned or picked off as they attempted to escape. At the end of the day, 921 Union troops had been killed, wounded, or captured, more than half of those engaged. Among the dead was Colonel Edward Baker, a lifelong friend and supporter of President Lincoln. News of this disastrous defeat soon reached Washington, prompting a massive public outcry. Though relatively minor in comparison to later bloodlettings, this engagement had

national political repercussions, spurring the formation of a Congressional Joint Committee on the Conduct of the War. Made a scapegoat for his part in the debacle, General Stone was accused of “the most atrocious blunder in history,” and imprisoned at Fort Lafayette in New York harbor. And for days after the battle, Union corpses washed up along the banks of the Potomac in Washington, D.C., a grisly reminder of this military blunder (Howard 1994).

The first detailed map of Loudoun County was drafted by cartographer Yardley Taylor in 1853 (Figure 4). Despite certain limitations (e.g. he only indicated the properties of those who paid him a fee), both Confederate and Union forces relied on the Taylor map during their campaigning in Loudoun County during the Civil War. Unfortunately, the Taylor map sheds little light on the pattern of settlement within the study area at this time. Though he indicated the location of the house and mill of J.P. Smart along the Potomac to the north of the study area, he did not note the presence of the Jackson House, or any other features within this vicinity. Similarly, a Union military map of northern Virginia drafted in 1862 showed virtually no detail within this area. Clearly derived in part from the Taylor map, the Jackson House was not included in this later map (Figure 5).

Farmland to Suburbia, 1865-present

Loudoun County faced a difficult period of rebuilding after four long years of war. Striking at Mosby’s partisans, Union forces had damaged or destroyed buildings, burned crops, and dispersed livestock. Both sides had helped themselves to the county’s ample agricultural resources, and continual military activity had effectively disrupted everyday life. Businesses were shut down, farms left poorly attended, and local government services suspended. The emancipation of the county’s slaves proved financially damaging for many local landowners, and land prices dropped considerably in the immediate postwar period. Despite these numerous handicaps, however, Loudoun County rebounded from the trauma of war with relative speed. By 1870 agricultural production had surpassed antebellum levels, and the county was well on its way to recovery—at least physically (Poland 1976: 184, 186, 222-23).

Loudoun County in the late nineteenth and early twentieth centuries was predominantly rural and agricultural, its white population having remained essentially constant over the past century. The post-First World War era period ushered in significant changes to the county’s agrarian lifestyle, however. Farming became increasingly specialized, with an increasing emphasis on dairy farming, beef cattle, and poultry. After World War II, increasing suburbanization and agricultural mechanization and specialization overshadowed the moderately-sized family farm, which had formed the backbone of Loudoun’s economy since the late eighteenth century (Poland 1976).

Mid-twentieth-century U.S.G.S. quadrangle maps of the Leesburg area indicate that three standing structures were present within the study area as early as 1944 (Figure 6). A dwelling and associated outbuilding were situated roughly where the modern trailer is located, while another farm building, most likely the existing barn/corn-crib, was indicated along the unimproved road leading to the river. Both the dwelling and outbuilding are no longer standing (Figure 7).

VI. CULTURAL RESOURCE POTENTIAL

PEDESTRIAN SURVEY OF THE STUDY AREA

The pedestrian survey of the study area included a walkover of the entire 85-acre study area, and the excavation of nine representative shovel test pits (STPs) in those areas with the highest probability for containing archaeological sites. Though no cultural materials were recovered, the pedestrian survey suggested that a number of locations would have proved attractive to both prehistoric and historic settlement. However, in most cases the soil conditions mitigate against the stratigraphic integrity of potential sites.

The most promising location for intact prehistoric archaeological resources is the Potomac River floodplain along the eastern margin of the study area. A representative shovel test (STP 1) excavated in this area indicated an alluvial soil profile in excess of two feet in depth. Any potential Native American features or deposits are likely situated at such a depth that only intensive ground-disturbing activities within this area would have the potential to disturb archaeological resources.

The next seven shovel tests (STP 2-8) were excavated atop those ridges and terraces in the interior of the study area that typically would have proved attractive sites for prehistoric camps. The shallow, deflated soil profiles (with topsoil typically ranging between 0.2 and 0.4 foot in depth) that any sites identified on these landforms would almost certainly have lost stratigraphic integrity.

The final shovel test (STP 9) excavated within the pasture portion of the study area exhibited a somewhat deeper soil profile, which would explain its current agricultural use. The most likely location for an historic occupation in this area is now encompassed by the current occupation. The integrity of any archaeological materials in this location will be dictated by the extent to which the recent occupation has disturbed the area.

In two locations within the study area, what appears to be an historic road trace diverges from the existing dirt road that traverses the property. The date of these earlier sections of road is not known, though it is possible that they are remnants of the road used by Philbrick's scouting party on the evening of October

20, 1861, prior to the Battle of Ball's Bluff.

A brief inspection of the eight standing structures on the property suggested that none are in excess of 50 years old, and so would not be eligible for listing in the National Register of Historic Places.

As a result of the pedestrian survey and shovel testing of the study area, CRI recommends that those areas with the highest probability of containing archaeological resources comprise approximately 15 acres of the 85-acre property

PREHISTORIC NATIVE AMERICAN SITES

The study area exhibits relatively high potential for the presence of prehistoric sites. Previous archaeological research in the region has indicated that throughout the Piedmont, prehistoric Native American sites increase in numbers and were more intensively occupied (longer-term and/or repeated use) with increasing distance toward rivers and high-order streams (Gardner 1983).

Previous archaeological research has indicated that the following variables are indicators of the presence of prehistoric Native American archaeological resources:

- Well-drained to moderately well-drained low relief landforms, such as terraces, benches and fans, that may be located up the tributary stream valleys, particularly at the confluences with one or more small streams. These landforms may not necessarily be evident on available topographic maps.
- Very gently sloping to level ridgelines overlooking tributary streams. The more convenient the area with regard to access to the drainages, the greater the chances that sites will be located there. Sites can occur on long, fingering ends of ridges overlooking the floodplains and streams, in ridge top saddles, and on high summits. However, the latter are less likely site locations unless stone material suitable for manufacture of tools and weapons is present in highgrade form and in sizable quantities.

There is a high probability for the presence of archaeological evidence of Archaic and Woodland prehistoric occupations within the study area (Figure x). Late Woodland period artifacts have been reported on Harrison Island, directly adjacent to the study area, and it is likely that satellite sites, including both settlement and temporary camping activities, are situated within the Potomac River floodplain. In addition, a number of high terraces overlooking the Potomac, and in the interior of the study area, are likely locations for temporary Archaic

and Woodland campsites associated with resource procurement. The state of preservation of archaeological features in the floodplain is most likely good, given the depth of the alluvium. However, the obvious soil deflation on the high terraces within the study area suggests that any prehistoric sites in these locations have lost their stratigraphic integrity, and it is unlikely that they would meet the criteria of significance for eligibility in the National Register of Historic Places.

HISTORIC SITES

In his quantitative study of settlement patterns in eighteenth-century Virginia, Craig Lukezic discovered that soil type, more than any other consideration, determined where tobacco planters chose to live. Tobacco dominated the Virginia economy from the beginnings of English settlement in eastern Virginia through the American Revolution, and correspondingly dictated the nature of social and race relations. Since tobacco was overwhelmingly important as a staple crop, Lukezic hypothesized, it should follow that planters would choose to settle on lands most conducive to growing this crop. When he examined statistically the relative importance of a variety of environmental factors in site selection, including soils, access to drinking water, proximity of navigable waterways, and distance from the nearest neighbor, Lukezic discovered that soil type, above all, was the most significant locational factor affecting colonial settlement (Lukezic 1990).

Tobacco plants grow best in gently sloped (2-6 percent), well drained, loosely structured soils such as light sand or sandy loam. The taste of the tobacco is also strongly influenced by soils, the best flavor imparted by those with siliceous parentage. Using data supplied by the Soil Conservation Service, United States Department of Agriculture, Lukezic (1990) ranked soils according to their suitability for tobacco cultivation. The distance of identified colonial sites to water and site elevation were also considered, though the variability of these factors between sites suggested, as Lukezic had noted for James City and York counties, that these considerations were not as important as soil and slope in influencing settlement patterns.

According to Lukezic's model for predicting colonial settlement patterns, the primary considerations in defining areas of high probability for colonial sites should be soil type and slope, with an emphasis on sandy loam soils with slopes of 10 percent or less. The probability of locating colonial period resources diminishes accordingly on soil types and slopes less conducive to growing tobacco.

By the latter years of the eighteenth century all Loudoun County planters, great or small, were beginning to feel the pinch of a sputtering, century-old tobacco

economy. After a few decades of prosperity, tobacco prices once again were on the decline by the 1760s and 1770s. Meanwhile, decades of intensive tobacco farming had simply exhausted all the best tobacco land, making it difficult—if not impossible—to boost production in order to counteract dwindling prices.

By the beginning of the nineteenth century a fundamental shift had occurred in the rural economy of Loudoun County. Farmers responded to the decline of tobacco by shifting their emphasis to raising grain crops and livestock. At the same time, a small group of Virginians dedicated to “scientific agriculture” helped to usher in a new era of productive farming. In his series of essays entitled *Arator*, Caroline County’s John Taylor demonstrated the benefits of four-field crop rotation, in which soils could be improved significantly by rotating corn, wheat, fertilizer, and clover. Similarly, in the early 1820s Edmund Ruffin publicized the effectiveness of marl in reducing soil acidity, a technique that could triple the productivity of Tidewater soils. Other agricultural improvements included contour plowing to reduce erosion, cast iron plows, threshing machines, and corn shellers (Kaplan 1993: 87-88).

The decline of the tobacco economy, the introduction of new crops, and advances in farm management and fertilization had a significant effect on settlement patterns in nineteenth-century Loudoun County, as throughout Tidewater. Lands formerly considered marginal could now be incorporated into agricultural production, a process accelerated by the increasing subdivision of family farms through inheritance. Extrapolating from Lukezic’s model, the environmental characteristics of nineteenth-century sites theoretically should exhibit a diminishing correlation between soil type and settlement.

Given what is known about settlement patterns in Loudoun County during the eighteenth and nineteenth centuries, it is clear that only a small portion of the study area has the potential for any significant pre-Civil War archaeological resources. Not surprisingly, the current occupation of the property is situated precisely where historic settlement of the area would have focused, on relatively productive and gently sloping agricultural soils. The remainder of the project area, with its steep slopes and interrupted topography, would simply not have been conducive to agriculture at any time during the historic period, and so the potential presence of an associated farmstead in this area is relatively low.

VII. CONCLUSIONS AND RECOMMENDATIONS

As a result of the cultural resources assessment of the proposed Veterans Park at Ball’s Bluff study area, CRI has determined that:

- No previously identified archaeological sites or architectural resources

within the study area have been previously identified or inventoried with the VDHR.

- Though the study area is adjacent to the Ball's Bluff Battlefield property (VDHR #253-5021), it lies beyond the boundaries of the core battlefield area defined in the Ball's Bluff Battlefield concept plan developed by the National Park Service in 1986. It appears that the scouting party commanded by Captain Philbrick may have passed through the property on the evening of October 20, 1861; the following day, the withdrawing troops of the 15th Massachusetts also may have passed through the southwesternmost portion of the study area in the opening hours of the battle. However, it is apparent from both documentary and cartographic sources that the most concentrated and significant fighting associated with the Battle of Ball's Bluff occurred to the south of the study area on the property administered by the Northern Virginia Regional Park Authority. Given the limited nature of the military activity on the property, it is unlikely that any significant archaeological remains associated with the battle are present.
- With the exception of the barn/corn crib, none of the standing structures within the study area appear to be over 50 years old. Regardless of age, none appears to retain the integrity of materials, workmanship, or setting to qualify them for listing in the National Register of Historic Places.
- The pedestrian survey and limited shovel testing of the study area indicated a number of locations in which prehistoric archaeological materials might be expected, including the Potomac River floodplain and several elevated landforms in the interior of the property. In total, the high probability areas for archaeological resources encompass approximately 15 acres. Within the floodplain, it appears that any cultural deposits would be deeply buried beneath at least 2 feet of alluvial overburden, and so would be disturbed only by significant earth-moving activities. Conversely, the elevated landforms exhibited extremely deflated, shallow soil horizons, suggesting that any sites located in these areas would be unlikely to meet the integrity criteria for listing in the National Register. Finally, though nineteenth-century maps do not indicate the presence of an occupation within the study area, the area with the highest potential for an historic occupation is the pasture in the southwest portion of the property. Mid-twentieth-century U.S.G.S. quadrangles indicate that a dwelling and associated outbuilding were situated on the landform now occupied by the trailer. The integrity of any potential archaeological remains would be dependent upon the extent of modern disturbance.

- While a Phase I archaeological survey of the property may identify previously unknown archaeological sites, it appears unlikely that this project will have an effect on significant historic properties. However, to avoid any unintentional adverse effects to archaeological resources, CRI recommends that any ground disturbing activities (i.e. grading or cutting) within those areas defined as having a high probability for the presence of cultural resources be preceded by Phase I archaeological testing.

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APPENDIX 'B' HUNTINGTON SERIES (7A)
SOILS REPORT

COMPILED BY
WILLIAMSBURG
ENVIRONMENTAL
GROUP

The Huntington series consists of very deep, well drained, moderately permeable soils that formed in alluvium on flood plains. Slopes range from 0 to 15 percent, but 0 to 5 percent is dominant. Mean annual temperature is 56 degrees F, and mean annual precipitation is 39 inches.

TAXONOMIC CLASS: Fine-silty, mixed, active, mesic Fluventic Hapludolls

TYPICAL PEDON: Huntington silt loam, on a 2 percent slope in a hay field. (Colors are for moist soil unless otherwise noted.)

Ap—0 to 11 inches; very dark grayish brown (10YR 3/2), rubbed) silt loam; moderate medium granular structure; friable; many fine roots; moderately acid; abrupt smooth boundary. (10 to 14 inches thick)

Bw1—11 to 20 inches; dark grayish brown (10YR 4/2) silt loam; very dark grayish brown (10YR 3/2) ped faces; weak medium subangular blocky structure; friable; many fine roots; slightly acid; gradual wavy boundary. (0 to 15 inches thick)

Bw2—20 to 64 inches; dark brown (10YR 4/3) silt loam; dark brown (10YR 3/3) ped faces; weak medium and coarse subangular blocky structure; firm; few fine roots in upper part; slightly acid; gradual wavy boundary. (10 to 50 inches thick)

C—64 to 74 inches; dark brown (7.5YR 4/4) sandy clay loam; massive; friable; moderately acid.

TYPE LOCATION: Wood County, West Virginia; 225 yards south of Belleville, 450 yards west of State Route No. 2

RANGE IN CHARACTERISTICS: Solum thickness is commonly 40 to 60 inches but ranges to 70 inches. Thickness of the mollic epipedon is commonly 10 to 14 inches but ranges to 24 inches. Unlimed soils range from moderately acid to mildly alkaline throughout the profile. Rock fragments are commonly less than 1 percent but range to 3 percent by volume in the solum. Rock fragments of gravel or cobbles range from 0 to 30 percent in the C horizon. Mica flakes are common in many pedons.

The A or Ap horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1, 2, or 3. It is dominantly silt loam, but the range includes silty clay loam and loam.

The AB or BA horizon, where present, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 or 3 in ped interiors. Ped surface colors are similar to the matrix colors of the A or Ap horizon.

The Bw horizon has hue of 10YR or 7.5YR, value of 4, and chroma of 2, or value of 4 or 5, and chroma of 3 or 4. Ped coatings commonly have value of 3, but range from

2 through 4. The Bw horizon is silt loam or silty clay loam. Clay content averages less than 30 percent.

The C horizon has colors similar to those of the Bw horizon. The C horizon commonly contains more sand than the Bw horizon and is stratified. Texture of the fine-earth fraction includes silt loam, fine sandy loam, loam, fine sand, silty clay loam, and sandy clay loam.

COMPETING SERIES: These are the Armiesburg and Omadi series in the same family and the Allison, Ashton, Boonesboro, Chagrin, Eudora, Huntsville, Moshannon, Nolin, Ross, and Roszburg series in other families. Armiesburg soils contain more than 30 percent clay in the Bw horizon. Omadi soils contain free carbonates and have solum thickness of less than 20 inches. Allison, Huntsville, and Ross soils have mollic epipedons that are more than 24 inches thick. The Ashton soils have an argillic horizon. Boonesboro soils have bedrock at a depth of less than 40 inches. Chagrin, Moshannon, and Nolin soils do not have amollic epipedon. Eudora soils contain less than 18 percent clay in the particle size control section. Roszburg soils are fine-loamy.

GEOGRAPHIC SETTING: Huntington soils are on flood plains. Slope gradients generally range from about 0 to 5 percent, but slopes ranging to 15 percent are common near large streams. Huntington soils formed in alluvium washed from soils formed in shale, sandstone, and limestone. Mean annual precipitation ranges from 35 to 55 inches, and mean annual air temperature ranges from 47 to 59 degrees F.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Allegheny, Ashton, Chagrin, Dunning, Kanawha, Lindside, Melvin, Monongahela, Newark, Sciotoville, and Wheeling soils. The Allegheny, Monongahela, Sciotoville, and Wheeling soils have argillic horizons and are on stream terraces. Ashton and Kanawha soils are well drained and are on low stream terraces on high flood plains. The Chagrin, Dunning, Lindside, Melvin, and Newark soils are on flood plains. Chagrin soils are well drained; Lindside soils are moderately well drained; Newark soils are somewhat poorly drained; and Melvin and Dunning soils are poorly drained.

DRAINAGE AND PERMEABILITY: Well drained. Runoff is medium. Permeability is moderate.

USE AND VEGETATION: Most areas are in crops or pasture. Original vegetation was presumably mixed hardwoods.

DISTRIBUTION AND EXTENT: West Virginia, Pennsylvania, Maryland, Virginia, Ohio, Kentucky, Indiana, Illinois, Michigan, Missouri, and Tennessee. Total Extent is large.

MLRA OFFICE RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Wheeling area, West Virginia, 1906.

Diagnostic horizons recognized in this profile are:

- a. Mollic epipedon - The zone from 0 to 11 inches (Ap horizon).
- b. Cambic horizon - The zone from 11 to 64 inches (Bw1 and Bw2 horizons).

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MANASSAS SERIES (14B)

Soils of the Manassas series are very deep moderately well drained to well drained and have moderate to moderately rapid permeability. They formed in colluvial and residual materials derived from shale, siltstone and conglomerate in the Piedmont Province. The mean annual temperature is about 53 degrees F, and the mean annual precipitation is about 40 inches. Slopes range from 0 to 7 percent.

TAXONOMIC CLASS: Fine-loamy, mixed, mesic Ultic Hapludalfs

TYPICAL PEDON: Manassas silt loam - cultivated.

Ap—0 to 10 inches; dark reddish brown (5YR 3/4) silt loam; weak fine granular structure; very friable; many fine roots; few fine and medium pores; moderately acid; clear smooth boundary. (0 to 10 inches thick)

AB—10 to 16 inches; reddish brown (5YR 4/3) silt loam; weak fine granular and fine subangular blocky structure; very friable; common fine roots; few fine and medium pores; 2 percent weathered shale fragments up to 1 inch across; strongly acid; clear smooth boundary. (0 to 10 inches thick)

Bt1—16 to 24 inches; dark reddish brown (5YR 3/4) silt loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; common fine roots; few medium pores; few faint clay films on faces of peds; few black mineral concretions; 5 percent weathered shale fragments up to 1 inch across; strongly acid; gradual smooth boundary.

Bt2—24 to 30 inches; reddish brown (5YR 4/4) silt loam; few fine faint yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; few fine roots; few medium pores; common distinct clay films on faces of peds; 5 percent weathered shale fragments up to 1 inch across; strongly acid; gradual smooth boundary. (Combined thickness of the Bt horizon is 12 to 35 inches)

BC—30 to 40 inches; reddish brown (5YR 4/4) silt loam; few fine distinct pale brown (10YR 6/3) mottles; weak fine subangular blocky structure; friable; slightly sticky, slightly plastic; common black mineral concretions; 10 percent weathered shale and conglomerate fragments up to 4 inches across; 2 percent quartz pebbles; very strongly acid; gradual wavy boundary. (4 to 16 inches thick).

C—40 to 60 inches; reddish brown (5YR 5/4) very channery silt loam; few fine faint yellowish red (5YR 5/8) and pinkish gray (5YR 6/2) mottles; weak granular structure; friable; 50 percent weathered shale fragments up to 4 inches across; 5 percent quartz pebbles; very strongly acid.

TYPE LOCATION: Loudoun County Virginia; 1 mile south of Leesburg VA. Near Virginia Route 621.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 30 to 60 inches. Depth to hard bedrock is greater than 60 inches. Rock fragments of shale, siltstone, conglomerate or quartz range from 0 to 15 percent in the A horizon and the upper part of the B horizon and from 15 to 60 percent in the lower part of the B horizon and C horizon. The soil is very strongly or strongly acid, unless limed.

The A horizon commonly has hue of 7.5YR or 5YR, value of 3 through 6, and chroma of 3 through 6. Horizons with value of 3 and chroma of 2 or 3 are less than 6 inches thick. The A horizon is silt loam, fine sandy loam, or loam.

Most pedons have an AB horizon with hue of 7.5YR or 5YR, value of 3 through 5, and chroma of 3 through 6. It is silt loam or silty clay loam.

The E horizon, where present, has hue of 5YR or 7.5YR value of 4 through 6 and chroma of 4 through 6. It is silt loam or loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 3 or 5, and chroma of 3 through 6; dry color value is 5 or more. It is silt loam, clay loam, or silty clay loam. The lower part of the Bt horizon is mottled in most pedons.

The BC horizon has colors similar to the Bt2 horizon. It is silt loam, loam, or silty clay loam in the fine earth fraction.

The C horizon has hue of 2.5YR through 7.5YR, value of 3 through 6, and chroma of 3 through 8. It is silt loam or silty clay loam in the fine earth fraction. Cr horizons are in some pedons. They are commonly weathered shale or siltstone. Thin interbeds of sandstone are allowed.

COMPETING SERIES: The Athol, Bolton, Bookwood, Brecknock, Carpenter, Culleoka, Door, Dormont, Duffield, Frondorf, Hayter, Lamotte, Legore, Loudonville, Mechanicsburg, Morrison, Myersville, Neshaminy, Penn, Ryder, Washington, Westmoreland, Wheeling, and Williamsburg series are in the same family. Athol soils contain rock fragments of sandstone and do not have mottles in the upper 40 inches. Bolton, Bookwood and Duffield soils have chert and limestone rock fragments. Brecknock, Carpenter, Door, Dormont, Frondorf, Morrison, Ryder, Washington, Westmoreland, Wheeling and Williamsburg soils have hue of 7.5YR or yellower in the Bt2 horizon. Carpenter soils are also well drained. Culleoka, Loudonville and Penn soils have bedrock at 20 to 40 inches. Hayter soils are well drained and have moderately rapid permeability. Lamotte soils contain sandstone fragments in the

lower part of the solum in the Cr horizon. Legore, Myersville and Neshaminy soils have igneous rock fragments. Mechanicsburg soils have a lithologic discontinuity within 40 inches.

GEOGRAPHIC SETTING: Manassas soils are on footslopes, colluvial fans, along drainageways, and in narrow saddles of the Triassic lowlands in the Piedmont Province. Slopes range from 0 to 7 percent. The soils developed in colluvial and residual materials derived from dominantly shale, siltstone, and conglomerate. Mean annual temperature ranges from 52 degrees to 59 degrees F. Mean annual precipitation ranges from about 36 to 44 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the competing and Penn soils and the Bermudian, Bucks and Klinesville soils. Bermudian soils do not have mottles within 40 inches of the soil surface. Klinesville soils have a solum less than 20 inches thick.

DRAINAGE AND PERMEABILITY: Moderately well drained and well drained; slow to medium runoff; moderate to moderately rapid permeability.

USE AND VEGETATION: Most of these soils have been cleared and are used for cultivated crops and pasture. Crops include corn, small grain and hay. Some areas are in woodland. Woodland vegetation is mostly oaks, hickory, yellow-poplar, sweet gum, dogwood and walnut.

DISTRIBUTION AND EXTENT: Virginia, Maryland, Pennsylvania and New Jersey; also possibly in North Carolina. The series is of moderate extent.

MLRA OFFICE RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Loudoun County, Virginia; 1954.

REMARKS: This revision changes the classification from Typic Hapludults to Ultic Hapludalfs based on data from laboratory analysis of several pedons in Virginia.

Diagnostic horizons and features recognized in this pedon are:

1. Ochric epipedon-zone from 0 to 16 inches (Ap and AB horizons)
2. Argillic horizon-zone from 16 to 30 inches (Bt horizons)
3. Base saturation between 35 and 60 percent at 60 inches

PENN SERIES (73B)

The Penn series consists of moderately deep, well drained soils formed in materials weathered from noncalcareous reddish shale, siltstone, and fine-grained sandstone normally of Triassic age. Slopes range from 0 to 60 percent. Permeability is moderate or moderately rapid. Mean annual precipitation is 43 inches. Mean annual temperature is 55 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, mesic Ultic Hapludalfs

TYPICAL PEDON: Penn silt loam - cropland. (Colors are for moist soil unless otherwise noted.)

Ap—0 to 8 inches; dark reddish brown (2.5YR 3/4) silt loam; weak fine and medium granular structure; friable, nonsticky, slightly plastic; many roots; many pores; 10 percent shale and siltstone fragments; slightly acid; clear wavy boundary. (6 to 12 inches thick)

Bt1—8 to 11 inches; reddish brown (2.5YR 4/4) channery silt loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common roots; many pores; common faint clay films on faces of peds; 15 percent shale and siltstone fragments; slightly acid; gradual wavy boundary. (2 to 6 inches thick)

Bt2—11 to 17 inches; reddish brown (2.5YR 4/4) channery silt loam; moderate fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; few roots; many faint clay films on faces of peds; 25 percent shale and siltstone fragments; moderately acid; clear wavy boundary. (4 to 14 inches thick)

Bt3—17 to 21 inches; weak red (10YR 4/4) channery silt loam; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; few faint clay films on faces of peds; common black coatings on rock fragments; 40 percent shale and siltstone fragments; moderately acid; clear wavy boundary. (0 to 9 inches thick)

C—21 to 34 inches; weak red (10R 4/4) channery silt loam; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; few faint clay films on faces of peds; common black coatings on rock fragments; 40 percent shale and siltstone fragments; strongly acid. (0 to 14 inches thick)

Cr—34 inches; dusky red (10R 3/3) soft, fractured, shale and siltstone bedrock.

TYPE LOCATION: Montgomery County, Pennsylvania; Perkiomen Township, 1 mile N of Trappe, 4000 feet N intersection of U.S. Route 422 and Church road, 200 feet E of Church road in field.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 17 to 34 inches. Depth to bedrock ranges from 20 to 40 inches. Rock fragment content, by volume, ranges from 2 to 30 percent in the A horizon, from 5 to 50 percent in individual horizons of the B, and from 30 to 90 percent in the C horizon, the control section average is less than 35 percent. The soil, where unlimed, ranges from extremely through strongly acid in the upper part of the solum, is strongly acid or moderately acid in the lower part of the solum, and ranges from strongly acid through slightly acid in the C horizon.

The Ap horizon has hue of 7.5YR through 10R, value of 3 or 4, and chroma of 2 through 4. Texture is silt loam or loam in the fine-earth fraction.

The B horizon has hue of 10R through 5YR, value of 3 through 6, and chroma of 2 through 6. Texture is silt loam, loam or silty clay loam in the fine-earth fraction.

The C horizon has hue of 10R through 5YR, value of 3 or 4, and chroma of 2 through 4. Texture is silt loam, loam, or sandy loam in the fine earth-fraction.

COMPETING SERIES: The Athol, Bolton, Bookwood, Brecknock, Caribel(T), Carpenter, Cateache, Culleoka, Door, Dormont, Duffield, Dumfries, Frondorf, Grayford, Greencreek, Hayter, Lamotte, Legore, Loudonville, Manassas, Mechanicsburg, Morrison, Myersville, Neshaminy, Oatlands, Panorama, Ryder, Spriggs, Sudley, Washington, Weedmark, Westmoreland, Wheeling, and Williamsburg series are in the same family. All of these soils except Cateache, Culleoka, Frondorf, Loudonville, Oatlands, Ryder and Spriggs are more than 40 inches from the soil surface to bedrock. Cateache soils have less than 15 percent fine and coarser sand. Culleoka, Frondorf, Loudonville, and Ryder soils have hue of 7.5YR or yellower in the B horizon. Oatlands soils contain rock fragments of triassic sandstone and conglomerate. Spriggs soils have rock fragments of gneiss and schist.

GEOGRAPHIC SETTING: Penn soils are on nearly level to steep moderately dissected uplands. Slopes range from 0 to 60 percent. They formed in materials weathered from noncalcareous reddish shale, siltstone, and fine-grained sandstone, normally of Triassic age. The climate is humid temperature. Mean annual precipitation ranges from 38 to 48 inches, mean annual air temperature ranges from 50 to 59 degrees F, and the frost free season ranges from 170 to 200 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Abbottstown, Athol, Bucks, Croton, Klinesville, Lewisberry, Readington, and Reaville soils. The Abbottstown, Croton, and Readington soils have fragipans. Athol and Lewisberry soils are more than 40 inches to bedrock. Klinesville soils have bedrock within 20 inches. Reaville soils have mottles in the top 10 inches of the agrillic horizon.

DRAINAGE AND PERMEABILITY: Well drained; runoff is medium to very rapid and permeability is moderate or moderately rapid.

USE AND VEGETATION: About 75 percent cleared and largely used for rotation cropland. Woodlands are mixed hardwoods dominated by oaks.

DISTRIBUTION AND EXTENT: Southeastern Pennsylvania, New Jersey, Maryland and Virginia. The series is of large extent.

MLRA OFFICE RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Lebanon County, Pennsylvania, 1901.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

1. Ochric epipedon - the zone from the surface of the soil to a depth of 8 inches (Ap horizon).

2. Argillic horizon - the zone from 8 to 21 inches (Bt horizon).

ADDITIONAL DATA: Laboratory data are available on two pedons sampled in Montgomery County, Pennsylvania and one pedon sampled in York County, Pennsylvania.

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ASHBURN SERIES (74B)

The Ashburn series consists of moderately deep and moderately well drained soils that formed in reworked alluvium and the underlying Triassic siltstone, fine-grained sandstone, and shale residuum. Slopes range from 0 to 8 percent. Mean annual temperature is about 55 degrees F. Mean annual precipitation is about 41 inches.

TAXONOMIC CLASS: Fine-silty, mixed, active, mesic Oxyaquic Hapludalfs

TYPICAL PEDON: Ashburn silt loam-on a 2 percent slope in a corn field. (colors are for moist soil)

Ap—0 to 8 inches; yellowish brown (10YR 5/4) silt loam; moderate fine granular structure; friable, slightly sticky, nonplastic; strongly acid; abrupt smooth boundary (2 to 10 inches thick)

Bt1—8 to 26 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine subangular blocky structure; firm, slightly sticky, slightly plastic; many faint clay films on faces of peds; common medium distinct reddish brown (5YR 5/3) iron depletions on faces of peds; common medium distinct brownish yellow (10YR 6/8) soft masses of iron accumulation; strongly acid; gradual smooth boundary.

2Bt2—26 to 34 inches; yellowish red (5YR 4/6) silty clay loam; weak medium subangular blocky structure; firm, slightly sticky, slightly plastic; common distinct clay films on faces of peds; many faint common medium distinct reddish gray (5YR 5/2) and many medium light reddish brown (5YR 6/3) iron depletions on faces of peds; common medium distinct brownish yellow (10YR 6/8) soft masses of iron accumulation; strongly acid; gradual smooth boundary. (Combined thickness of the Bt horizon is 10 to 35 inches)

2C—34 to 39 inches; red (2.5YR 4/6) channery silty clay loam; massive; friable, slightly sticky, nonplastic; common medium faint reddish brown (5YR 5/4) soft masses of iron accumulation on surfaces of rock fragments; 30 percent siltstone channers; moderately acid; clear smooth boundary. (0 to 10 inches thick)

2R—39 inches; hard red siltstone bedrock.

TYPE LOCATION: Loudoun County, Virginia. 2000 feet east of the intersection of VA-647 and VA-641, and 2180 feet east northeast of the intersection of VA-642 and VA-641.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 18 to 40 inches. Depth to bedrock is 20 to 40 inches. Rock fragments of rounded vein quartz and red siltstone channers range from 0 to 5 percent in the Ap and Bt horizons. Rock fragments of red siltstone channers range from 0 to 35 percent in the 2Bt and 15 to 55 percent in the 2C horizons. Reaction is very strongly acid through moderately acid.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 4 through 6. It is silt loam or loam.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 through 6, and chroma of 3 through 6. It is silt loam or silty clay loam.

The 2Bt horizon has hue of 2.5YR or 5YR, value of 4 through 6, and chroma of 3 through 6. It is silt loam or silty clay loam in the fine-earth fraction.

The 2C horizon has hue of 10R through 5YR, value of 3 or 4, and chroma of 3 through 6. It is loam, silt loam, or silty clay loam in the fine-earth fraction.

The 2Cr horizon, where present, is dense in place and generally can be excavated with standard hand equipment. It is weathered red beds of variable grain size and bed thickness.

COMPETING SERIES: These are the Cidermill, Eilertsen, Elk, Elkinsville, Gallipolis, Parke, Pike, Rosine, Stonehead, Veronia, and Wellston series in the same family. All these soils are very deep to bedrock.

GEOGRAPHIC SETTING: Ashburn soils are on broad, convex interfluvies in the Culpeper Basin of the northern Piedmont. These soils formed in reworked alluvium and the underlying red Triassic interbedded siltstone, fine-grained sandstone, and shale residuum. Slopes range from 0 to 8 percent. The mean annual air temperature ranges from 49 to 57 degrees F. Mean annual precipitation ranges from 35 to 45 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Albano, Arcola, Dulles, and Panorama soils. Albano soils are poorly drained and are in drainageways. Arcola and Panorama soils are well drained and on similar landscape positions. Dulles soils are somewhat poorly drained and are in concave positions.

DRAINAGE AND PERMEABILITY: Moderately well drained. Runoff is medium. Permeability is moderate in the upper horizons and moderately slow in the lower horizons.

USE AND VEGETATION: Row crops, hay crops, residential uses. Some woodland of northern red oak and Virginia pine.

DISTRIBUTION AND EXTENT: Virginia and possibly Maryland and Pennsylvania. The series is of small extent.

MLRA OFFICE RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Loudoun County, Virginia, 1998.
Named for a village in Loudoun County.

REMARKS: Previously mapped as Readington soils. Diagnostic horizons and features recognized in this pedon:

1. Ochric epipedon-zone from the surface to 8 inches (Ap horizon)
2. Argillic horizon-zone from 8 to 34 inches (Bt1 and 2Bt2 horizons)

ADDITIONAL DATA: Mechanical analysis performed by Loudoun County, Virginia Department of Environmental Resources staff. Chemical analysis by Virginia Polytechnic Institute and State University. Lab numbers are: Loudoun County DER=74-B-1 through 74B-2-4; VPI&SU=8853372 through 8853375, and 8853361.

SIR=VA0365

MLRA=148

REVISED=09/97, RRD

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NESTORIA SERIES (77C3, 77D3, 77E3)

Soils of the Nestoria Series are shallow and well drained. They formed in materials that weathered from Triassic and Jurassic red beds of siltstone, and fine grained sandstone. They are on side slopes in dissected landscapes in the Culpeper Basin of the Northern part of the Piedmont Plateau. Slopes range from 2 to 50 percent. Mean annual temperature is about 54 degrees F., and annual precipitation is about 41 inches.

TAXONOMIC CLASS: Loamy-skeletal, mixed, active, mesic, shallow Ochreptic Hapludults

TYPICAL PEDON: Nestoria gravelly silt loam-fescue hayfield on a moderately steep side slope with 15 to 25 percent slopes (Colors are for moist soils.)

Ap—0 to 8 inches; reddish brown (2.5YR 4/4) gravelly silt loam; moderate fine granular structure; very friable; many fine and medium roots; 25 percent siltstone gravel; strongly acid; abrupt smooth boundary. (0 to 10 inches thick)

Bt—8 to 14 inches; reddish brown (2.5YR 4/4) very gravelly silt loam; weak, fine, subangular blocky structure; friable; many fine roots; common thin clay films on ped faces; 40 percent siltstone gravel; few fine and very fine mica flakes; strongly acid; clear smooth boundary. (3 to 10 inches thick)

C—14 to 18 inches; reddish brown (2.5YR 4/4) very gravelly silt loam; massive; very friable; common fine roots; 50 percent siltstone gravels and siltstone channers; many fine and very fine mica flakes; strongly acid; clear irregular boundary. (0 to 8 inches thick)

Cr—18 to 30 inches; reddish brown (2.5YR 4/4) fractured weathered interbedded Triassic siltstone and fine grained sandstone.

R—30 inches; hard Triassic red beds.

TYPE LOCATION: Prince William County, Virginia, approximately 150 feet west of County Route 677; approximately 3/4 mile north of State Route 234.

RANGE IN CHARACTERISTICS: Solum ranges from 10 to 20 inches. Depth to Cr horizon ranges from 10 to 20 inches, and depth to hard bedrock ranges from 20 to 40 inches. Rock fragments of siltstones and sandstones range from 15 to 50 percent in the A horizon, and from 35 to 75 percent in the B and C horizon. The fine earth fraction of the textural control has more than 50 percent silt plus very fine sand. The mineralogy of the sand and silt fractions are dominated by iron oxides, quartz and muscovite mica. Soil reaction ranges from very strongly through medium acid unless limed.

The A or Ap horizon has hue of IOR through 5YR, value of 3 or 4 and chroma of 3 or 4. Then A horizons include chroma of 2. It is silt loam or loam in the fine earth fraction.

The E horizon, where present, has hue of IOR through 5YR, value of 3 through 5, and chroma of 3 or 4. It is silt loam, or loam, in the fine earth fraction.

The Bt horizon has hue of IOR through 5YR, value of 3 or 4, and chroma of 3 through 6. It is silt loam, or loam in the fine earth fraction.

The C horizon has hue of IOR through 2.5YR, value of 3 or 4, and chroma of 3 through 6. It is silt loam, or loam in the fine earth fraction.

The Cr horizon is dense in place but well weathered red beds that can be dug with hand tools. Bedrock is not removable with hand equipment.

COMPETING SERIES: The Catlett series is the only series in the same family. Catlett

soils are developed from hornfil and granulite parent materials and do not have red hue in the solum. Oteen and Klinsville soils are in closely related families. The Oteen soils have less than 35 percent rock fragments in the control section. The Klinsville soils do not have an Argillic horizon.

GEOGRAPHIC SETTING: Nestoria soils are on narrow ridgcrests and side slopes in highly dissected landscapes in the Culpeper Basin of the Piedmont Plateau. Slopes range from 2 to 50 percent. The soils are formed in residuum of weathered red beds. The annual temperature ranges from 53 to 57 degrees F., and annual precipitation ranges from 38 to 44 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the well drained Arcola, and Panorama soils, and the well to moderately well drained Manassas soils. The moderately well to somewhat poorly drained Dulles are also associated. All the associated soils have less than 35 percent rock fragments and have thicker sola.

DRAINAGE AND PERMEABILITY: Well drained; medium to rapid runoff; permeability is moderate.

USE AND VEGETATION: Most of this soil is in forest or pasture. Native vegetation is oak-hickory forest.

DISTRIBUTION AND EXTENT: Culpeper Basin of Virginia and the southwestern part of the Gettysburg Basin of Pennsylvania and Maryland. The series is of small extent.

MLRA OFFICE RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Prince William County, Virginia, 1985.

ADDITIONAL COMMENTS: Laboratory data for the typifying pedon is available from the Soil Survey Lab, Virginia Tech. This soil was formerly included in the Klinsville series, which is classified as a loamy-skeletal mixed mesic lithic Typic Dystrochrept.

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**APPENDIX 'C'
CORRESPONDENCE
WITH
COMMONWEALTH
OF VIRGINIA
DEPARTMENT OF
CONSERVATION
AND RECREATION**

James S. Gilmore, III
Governor

John Paul Woodley, Jr.
Secretary of Natural
Resources



David G. Brickley
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

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<http://www.state.va.us/~dcr/vaher.html>

March 2, 2001

Mr. Patrick Wegeng
Williamsburg Environmental Group, Inc.
46030 Manekin Plaza, Suite 160
Ashburn, VA 20166

Re: Public Park in Loudoun County

Dear Mr. Wegeng:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biological and Conservation Data System (BCD) for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the information currently in our files, a hawthorn (*Crataegus pruinosa*, G5/S1/NF/NS), White trout-lily (*Erythronium albidum*, G5/S2/NF/NS) and Short's rockcress (*Arabis shortii*, G5/S2/NF/NS) have been documented in the project vicinity. However, the hawthorn record has not been verified since 1921. White trout-lily (*Erythronium albidum*, G5/S2/NF/NS) occurs in alluvial woods, coves, and moist woodlands (Gleason, 1952; Radford et al., 1968). In Virginia, this species is currently known from eleven occurrences in three counties.

Shale barren rockcress (*Arabis serotina*, G2/S2/LE/LE) is a narrow endemic of shale barrens in Virginia and West Virginia. This species is restricted to shale barrens, shale ridge balds, and adjacent thin shaly woods on Devonian shales of the Brallier Formation and Ordovician shales of the Martinsburg Formation. It inhabits dry, open sites to more mesic, thinly wooded areas on southerly-facing slopes at elevations of 335-760m. Most individuals are found in partial shade, but occasionally they tolerate open, exposed sites (Wieboldt, 1991). This species is highly restricted and the number of individuals per population is low. Threats include deer browse, drought conditions, road construction, railroad construction, and other development activities. A significant threat to the insect pollinators of shale barren rockcress is presented by spraying of Dimilin and Bt for gypsy moth control. Since this species occurs in a very stressed environment, it cannot tolerate much disturbance. Due to the status of shale barren rockcress, DCR recommends coordination with USFWS, VDGIF and VDACS.

An Agency of the Natural Resources Secretariat

In addition, the information currently in our files, a significant Rich Cove/Mesic Slope Forest has been documented in the project vicinity and may occur at this location. For DCR purposes, significant communities are defined to include both outstanding examples of common community types and all examples of rare community types. Rare community types include both small remnants of types which formerly occupied a much larger land area and those restricted to habitats which have always been widely scattered on the landscape. As functional landscape units, natural communities are important for several reasons. They support a myriad of life forms too cryptic or poorly known to be catalogued and prioritized individually and provide the nurturing environment for both rare and common species. They also contribute to the maintenance of larger ecosystems and possess unique intrinsic scientific, educational, and aesthetic values. It is therefore important to locate, classify, and evaluate these features as part of any comprehensive inventory of natural heritage resources.

Mixed hardwood forests of fertile, mesic, mountain-slope habitats at elevations ranging from about 450 m (1500 ft) commonly to 1100 m (3600 ft) and more locally to 1400 m (4600 ft). Distinctive rich forests occurring at higher elevations of the Allegheny Mountains (Highland County) and the Blue Ridge are transitional to the two northern hardwood forest groups. Distributed locally throughout western Virginia, these forests are strongly associated with moist, sheltered, landforms (*i.e.*, coves, ravines, and concave lower slopes). Soils may be weathered from various substrates but are generally moderately acidic to moderately alkaline, with high base saturation. Characteristic trees include sugar maple (*Acer saccharum* var. *saccharum*), basswoods (*Tilia americana* var. *americana* and var. *heterophylla*), white ash (*Fraxinus americana*), tulip-poplar (*Liriodendron tulipifera*), and yellow buckeye (*Aesculus flava*). Herbaceous growth is lush with spring ephemerals and leafy, shade-tolerant forbs such as blue cohosh (*Caulophyllum thalictroides*), yellow jewelweed (*Impatiens pallida*), large-flowered trillium (*Trillium grandiflorum*), wood-nettle (*Laportea canadensis*), and many others. Compositional variation related to substrate and elevation is complex and will require intensive future study. The principal threats to rich cove forests are logging and invasion by garlic-mustard (*Alliaria petiolata*) and other shade-tolerant, exotic weeds.

Due to the potential for this site to support additional populations of natural heritage resources, DCR recommends an inventory of suitable habitat in the study area. With the survey results we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at (804) 371-6206 to discuss arrangements for field work. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS.

The Virginia Department of Agriculture and Consumer Services (VDACS), which has regulatory authority to conserve rare and endangered plant and insect species through the Virginia Endangered Plant and Insect Species Act, has established a Memorandum of Agreement with the Virginia Department of Conservation and Recreation (DCR). Under this Agreement DCR's Division of Natural Heritage, in consultation with VDACS, represents VDACS in its comments

and recommendations regarding the potential impact of reviewed projects or activities on state-listed plant and insect species. Since it has been determined that this project or activity may impact shale barren rockcress, a state-protected plant, VDACS will respond directly to ensure compliance with Virginia's Endangered Plant and Insect Species Act. Further correspondence regarding the potential impacts of this project or activity on state-listed plant and insect species should be directed to VDACS.

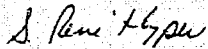
In addition, our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Any absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks additional natural heritage resources. New and updated information is continually added to BCD. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of \$80.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, 203 Governor Street, Suite 402, Richmond, VA 23219, ATTN: Cashier. Payment is due within thirty days of the invoice date.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,



S. René Hypes
Project Review Coordinator

CC: Ray Fernald, VDGIF
Eric Davis, USFWS
Keith Tignor, VDACS

APPENDIX 'D' The following comments were made in response to the concept plans shown for Veterans Park at Ball's Bluff at the August 2nd community meeting:

**MINUTES OF
AUGUST 2ND
COMMUNITY
MEETING**

**BY RHODESIDE &
HARWELL,
INCORPORATED**

1. TRAFFIC AND ACCESS ISSUES

- Concern was expressed re increased traffic through the community
- Use of Old Ball's Bluff Road:
- Some of the residents attending the meeting wanted the Town to consider park access from Old Ball's Bluff Road.
- However, those residents at the session with property backing up on Old Ball's Bluff Road were not in favor of this approach. One such resident reported that there is already some traffic (approximately 20-30 vehicles/day) along Old Ball's Bluff Road by those accessing Harrison Island.
- The issue of what the safest access route to the park would be was also raised, with some concern that access from Old Ball's Bluff Road may not be the safest route.
- Finally, the feasibility of using Old Ball's Bluff Road, from the standpoint of its acquisition/lease from the Veterans' Administration (who currently owns it), and of upgrading it to a true roadway was also discussed.
- There was concern about whether there would be parking spillover into the community. This was especially a concern with regard to an amphitheater option, since meeting participants worried about whether an adequate number of parking spaces was being provided in the park for such a facility.

2. PROGRAM ISSUES

Concern was expressed with regard to the following uses for the site:

SOCCER

- Some residents worried that this use would draw a lot of people to the site (hence increasing traffic through the community)
- Felt this would be a "high density use on a low density site;" felt this was, therefore, not an appropriate use for this "highly sensitive" historic area.
- Some residents felt that this use would "destroy the natural beauty" of the site, and urged the Town to put such facilities elsewhere.

BOAT RAMP

- There was also some concern expressed about how much traffic the boat ramp would generate. This person expressing this view felt that the facility would attract people both from the Town and countywide.

AMPHITHEATER

- Concern was expressed about the size of this facility, both in terms of parking and light/noise impacts.

OVERALL USE

- One participant asked for an estimate of how many people would use the park. (Note: this will, of course, depend on the program options selected).

NO NEW USES

- Several residents expressed the view that the Town should leave the site as it is (“no action”). One person felt that the only action should be the extension of the trail system from the NVRPA site into the new park.

3. HISTORIC AND ENVIRONMENTAL ISSUES

- One resident wanted it noted that he believes that the proposed Veterans Park at Ball’s Bluff (particularly the proposed entrance way) is an historic site, given its background as the place where the first shots were fired for the Battle of Ball’s Bluff. As such, he feels that the program for the site should effect and respect this historic significance.
- One resident questioned whether the environmental consultant had checked with any of the state or federal regulatory agencies with regard to rare/endangered species on the site. It was suggested that the team consult with the Audubon Society regarding this issue.
- There was some concern that the area proposed for the entrance road is typically a wet, “swampy” area.

4. GENERAL ISSUES

- Residents wanted to know the hours of operation for the new park (dawn to dusk). There was some concern that people would sneak into the park at night as they currently do.
- There was some skepticism expressed regarding the Town's long-term adherence to a master plan for this site. These people felt that "master plans" change over time, and that earlier plans for various sites in the Town had been approved, and then had been changed several years later. There was, therefore, concern that supporting a plan for the new park site at this time would not guarantee that the Town might not wish to change this plan (i.e., add more facilities) in the future.
- One participant asked if the Town could post updates to the plan on its website. One of the Park and Recreation Advisory Commissioners invited participants to attend regular commission meetings if they wish to do so.

**APPENDIX 'E'
TOWN OF
LEESBURG,
VIRGINIA
RESOLUTION
NUMBER 2002-160**

The Town of
**Leesburg,
Virginia**

PRESENTED September 24, 2002

RESOLUTION NO. 2002-160

ADOPTED September 24, 2002

A RESOLUTION: APPROVING THE PROPOSED MASTER PLAN FOR
VETERANS PARK AT BALLS BLUFF

WHEREAS, in March, 2001, the Town of Leesburg acquired an 86-acre tract of land with frontage on the Potomac River and located immediately adjacent to Balls Bluff Regional Park, which is operated by the Northern Virginia Regional Park Authority; and

WHEREAS, the Town Council appropriated funds as part of the Fiscal Year 2001 budget for the development of the park master plan site, which is now officially known as Veterans Park at Balls Bluff; and

WHEREAS, the Town Council awarded a contract to Rhodeside and Harwell, Incorporated to develop a master plan for the park site; and

WHEREAS, Rhodeside and Harwell worked closely with staff from the Leesburg Parks and Recreation Department, Leesburg Planning Department, and the Northern Virginia Regional Park Authority to develop alternative park plans; and

WHEREAS, Rhodeside and Harwell encouraged citizen involvement in the planning process by conducting two citizen input sessions; and

WHEREAS, as a result, the proposed alternatives were molded into one recommendation that promotes primarily passive development for the park site proposing a park access road to the river, an outdoor education/visitors' center, trails, and a non-motorized boat launch area; and

A RESOLUTION: APPROVING THE PROPOSED MASTER PLAN FOR
VETERANS PARK AT BALLS BLUFF

WHEREAS, the proposed master plan has been unanimously endorsed by both the Parks and Recreation Advisory Commission and the Planning Commission; and


WHEREAS, a public hearing was held on Tuesday, September 10, 2002, to consider the proposed master plan for Veterans Park at Balls Bluff; and

WHEREAS, the Director of Parks and Recreation recommends adopting the master plan for Veterans Park at Balls Bluff as presented.

THEREFORE, RESOLVED by the Council of the Town of Leesburg in Virginia that the proposed master plan for Veterans Park at Balls Bluff, dated August 2002, which promotes primarily passive development for the park site including a park access road to the river, an outdoor education/visitors' center, trails, and a non-motorized boat launch area, is approved as presented.

FURTHER, RESOLVED, that the implementation and timing of this long-range park master plan depends on the town-wide priorities of the Council, the availability of funding and the debt situation of the town at that time.

PASSED this 24th day of September 2002.


Kristen C. Umstadt, Mayor
Town of Leesburg

ATTEST:


Deborah Parry, Pro Tem
Clerk of Council

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