SHORELINE CONSIDERATIONS

Tidal shorelines are dynamic areas that are subject to both natural and man made stresses, and these stresses, in turn, are capable of degrading the living resources of the adjacent tidal waters. A central focus of the Chesapeake 2000 Agreement is the protection and restoration of these living resources, as evidenced by the following excerpt from the Agreement:

> "The Chesapeake Bay's natural infrastructure is an intricate system of terrestrial and aquatic habitats, linked to the landscapes and the environmental quality of the watershed. It is composed of the thousands of miles of river and stream habitat that interconnect the land, water, living resources and human communities of the Bay watershed. These vital habitats–including open water, underwater grasses, marshes, wetlands, streams and forests–support living resource abundance by providing key food and habitat for a variety of species. Submerged aquatic vegetation reduces shoreline erosion while forests and wetlands protect water quality by naturally processing the pollutants before they enter the water. Long-term protection of this natural infrastructure is essential. …"

Key management issues associated with tidal shoreline areas include:

(1) Shoreline erosion:

Tidal shoreline areas are typically dynamic and subject to the erosive force of tidal waters; private property and structures can be threatened by erosion. However, local engineered solutions to erosion concerns may, if not planned appropriately, aggravate erosion conditions elsewhere along the shoreline, resulting in water quality degradation through the introduction of sediment and associated nutrients as well as through the loss of natural riparian buffer areas.

(2) Shoreline access:

The recreational and aesthetic opportunities provided by tidal shoreline areas create demands for access to these areas. Yet the provision of access to these areas can, in some cases, have a deleterious effect on water quality. It should be stressed that some forms of recreational access to the tidal shoreline (e.g., activities related to environmental education, nature, and passive recreation) do not impact the shoreline and can provide a greater appreciation of the shoreline. However, other forms of access, while providing desirable recreational opportunities, can involve the clearing of vegetation that protects the shoreline from erosion and that provides valuable habitat and water quality improvement functions. Facilities associated with boating access (e.g., fueling facilities; sanitary waste storage facilities) can pollute water resources if not carefully managed. Motorboats themselves can create or exacerbate turbidity, thereby reducing water clarity and adversely affecting aquatic species. In addition, the

operation of such vessels can produce pollutants (e.g., spilled petroleum products, litter, and sanitary waste).

According to guidance provided by the Virginia Institute of Marine Science (VIMS), Fairfax County's tidal shoreline is approximately 76 miles in length, or slightly less than 1.5% of the entire tidal shoreline of the Commonwealth. One distinguishing characteristic of the County's shoreline area is its pattern of ownership. While much of the Commonwealth's shoreline area is privately owned (the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance's Local Assistance Manual states that less than one percent of the shoreline is publicly owned), the situation is quite different in Fairfax County, where, according to the VIMS Shoreline Situation Report, approximately 63% of the County's tidal shoreline was in public ownership (including Mount Vernon) in 1979. Substantial majorities of the County's nontidal Potomac River and Occoquan Reservoir shorelines are also in public ownership.

Along the tidal shoreline, the National Park Service owns and maintains the George Washington Memorial Parkway, which stretches approximately 8.3 miles between Mount Vernon and the City of Alexandria. Only relatively small portions of the tidal shoreline in this area are privately owned. The multi-use Mount Vernon Trail is a central feature of the Parkway; it stretches 18.5 miles along the Potomac River shoreline from Theodore Roosevelt Island (near Rosslyn in Arlington County) to Mount Vernon. The trail, roughly 2/3 of which is located in Fairfax County, provides a major source of public access for citizens of the entire region as well as to visitors to the region. Another major federal owner of tidal shoreline land in Fairfax County is the U.S. Army; Fort Belvoir includes substantial areas of tidal shoreline along the Potomac River, Dogue Creek, and Gunston Cove.

The Mason Neck peninsula, which abuts several tidal bodies of water (the Potomac River, Gunston Cove, Occoquan Bay, and Belmont Bay), is predominantly held in public ownership, with over 6,000 acres preserved by several governing agencies. This area contains a National Wildlife Refuge, a State Park, a Regional Park, a Special Recreation Management Area managed by the Bureau of Land Management, and the historic Gunston Hall Plantation, which is owned and operated by the Commonwealth of Virginia.

Publicly-owned land is also prevalent along the County's tidal Occoquan River shoreline above Belmont Bay. Mount Vernon, which is not under government control but is owned and maintained by the Mount Vernon Ladies Association, also contains a substantial tidal shoreline area. Conditions along the County's nontidal shoreline are similar, with more than 5,000 acres along the shoreline of the Occoquan Reservoir under the ownership of the Northern Virginia Regional Park Authority (NVRPA) and substantial portions of the nontidal Potomac River shoreline in County or federal ownership (with approximately 700 acres of land along the nontidal Potomac River shoreline in Fairfax County protected by NVRPA). Fairfax Water has implemented a Shoreline Easement Policy that establishes what may be permitted within its flood easement immediately adjacent to and surrounding the Occoquan Reservoir.

The extent of public ownership of shoreline areas within Fairfax County affords significant protection to these areas that might not otherwise exist. This pattern of ownership also serves to provide opportunities for public recreational access to the shoreline and limits private shoreline

access and erosion control issues to relatively small areas of the County's tidal shoreline. Finally, the character of public ownership of much of the County's shoreline serves to remove many of these areas from local land use control. The County retains approval authority over development proposals on Regional Park land but does not have such authority over actions proposed on state and federal lands. The County participates in the review of land use proposals on state and federal lands but does not possess the ultimate authority over land use decisions on these properties.

Because of development that has already occurred along the County's tidal shoreline and the extent of publicly owned tidal shoreline areas, there are relatively few vacant or underutilized residential properties remaining in these areas. The nature and implications of this characteristic as they relate to tidal shoreline access issues are addressed later in this section of the report. Figure 27 displays existing land uses near the County's tidal shoreline.

TIDAL SHORELINE EROSION

INTRODUCTION

The northernmost extent of Fairfax County's tidal shoreline is along Cameron Run at the Alexandria City boundary. The tidal shoreline continues southward along Cameron Run, Hunting Creek, and the Potomac River and its embayments along and near the George Washington Memorial Parkway, Fort Hunt Park, Mount Vernon, Fort Belvoir, Pohick Bay Regional Park, Mason Neck State Park, and the Mason Neck National Wildlife Refuge. The tidal shoreline extends up the Occoquan River up to a point a short distance downstream of the lowermost of the two dams on the River. The Occoquan Reservoir, which is referenced elsewhere in this report, is located in the nontidal area upstream of the upper dam.

Webster's New Collegiate Dictionary defines "shoreline" as "the line where a body of water and the shore meet." While the actual location of this contact point in tidal areas will vary with the tide, the tidal shoreline is, for mapping purposes, typically the point of contact at mean low water. The tidal shoreline is subject to the littoral dynamics of tidal flow, wave action, prevailing currents and fetch.

The physical stability and the integrity of the shoreline are essential to water quality protection. It is with this in mind that the authors of the Chesapeake Bay Preservation Area Designation and Management Regulations sought to protect the water quality of the Bay and its tidal tributaries by designating the tidal shoreline as a primary component of the Resource Protection Area. The tidal shoreline is, therefore, a core component of the County's Resource Protection Area designation.

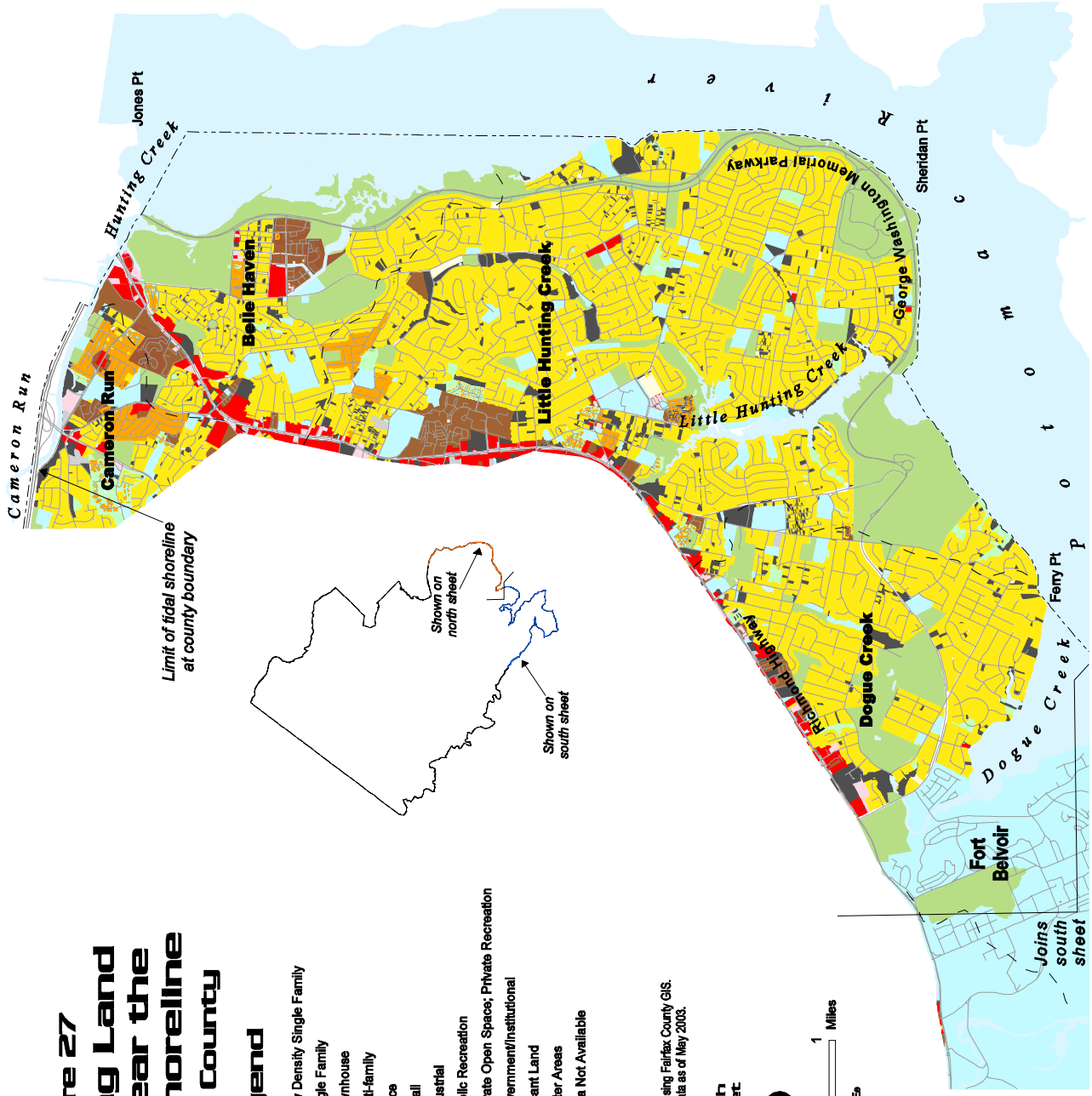
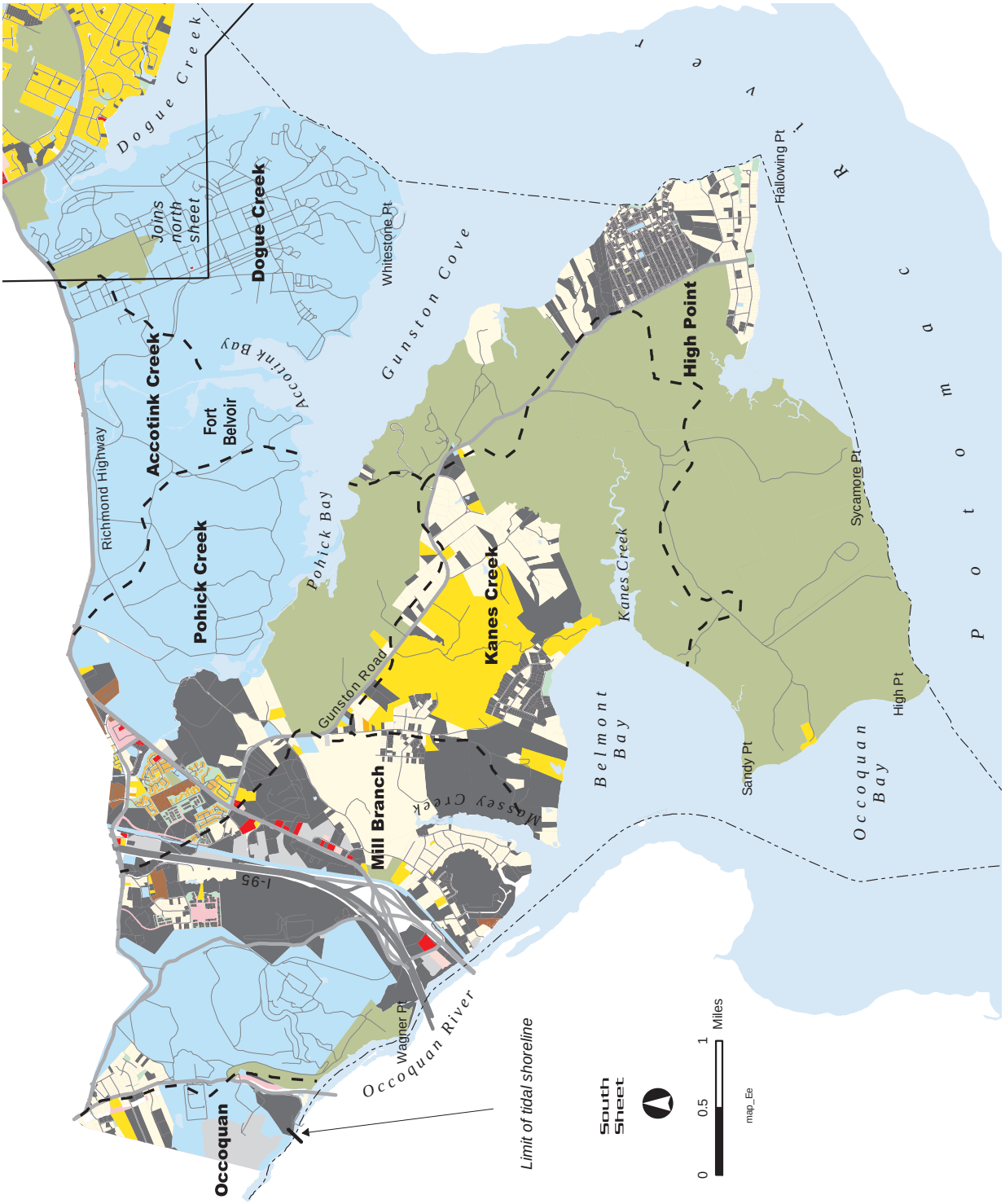


Figure 27
Existing Land Use Near the Tidal Shoreline
Fairfax County


Dogue Creek
Joins north sheet
Dogue Creek
Whitestone Pt
Gunston Cove
Accotink Bay
Accotink Creek
Fort Belvoir
Richmond Highway
Pohick Bay
Pohick Creek
Gunston Road
Kanes Creek
Kanes Creek
High Point
Hallowing Pt
Sycamore Pt
Potomac River
Belmont Bay
Massey Creek
Mill Branch
I-95
Sandy Pt
High Pt
Occoquan Bay
Wagner Pt
Occoquan River
Occoquan
Limit of tidal shoreline
South Sheet
0
0.5
1
Miles
map_Ee

AERIAL PHOTO ANALYSIS OF TIDAL SHORELINE CONDITIONS--OVERVIEW

A visual survey of the County's tidal shoreline was performed in February and March of 2004 using 2002-2003 aerial orthophotography and other information.[5] The goals of the survey were threefold:

- Documentation of erosion and accretion along the tidal shoreline;
- Documentation of shoreline reaches where artificial shoreline stabilization structures are located; and
- Documentation of shoreline access structures (e.g., piers, boathouses, and ramps) that exist along the County's tidal shoreline.

Results from the shoreline erosion control components of this study are discussed briefly in this section; the next section of the report presents information regarding shoreline access facilities. Results from this analysis, presented for individual segments of the tidal shoreline based on watershed boundaries, are also included in Appendix A. It is noted that the information presented herein is based solely on air photo interpretation and has not been field checked. The analysis has been conducted for planning purposes only and does not substitute for a shoreline situation report prepared by the Virginia Institute of Marine Science.

There is little historic information available that describes erosion conditions along Fairfax County's tidal shoreline. The two documents of note that address this issue are:

- The Shoreline Situation Report: Counties of Fairfax and Arlington and the City of Alexandria, Virginia Institute of Marine Science, 1979; and

- "Tidal Shoreline Erosion in Northern Virginia," prepared by the Northern Virginia Planning District Commission (NVPDC) (now the Northern Virginia Regional Commission--NVRC) in 1992.

While the NVPDC document is more current than the Shoreline Situation Report, it relied on a comparative analysis of shoreline locations as depicted on two sets of United States Geological Survey 7.5 minute topographic quadrangle maps (dating from the early 1980s and mid-1960s/early 1970s). The potential errors associated with an evaluation of shoreline changes were acknowledged in the NVPDC report, and the report stressed that its information should not be used for site-specific planning purposes. For that reason, the shoreline analysis conducted for this report is presented in Appendix A along with information from the 1979 Shoreline Situation Report rather than the 1992 NVPDC document.

---

[5] The following sources and tools were used in this analysis:
Fairfax County Orthophotography, March 1997
Pictometry (oblique aerial photography), January – August, 2003
Aerial Imagery © 2002 Commonwealth of Virginia
ArcGIS 8.3
ArcView3.3
ArcCatalog

The 1979 Shoreline Situation Report describes tidal erosion through the use of the following definitions:

- Less than (<) one foot per year –slight
- Between one foot and three feet – moderate
- Greater than three feet per year – severe

The analysis conducted in 2004 for this report did not characterize rates of erosion.

The results of the analysis of shoreline erosion conditions along the County's tidal shoreline are presented in Figure 28. Figure 29 presents information regarding the locations and types of shoreline erosion control structures that have been identified in this analysis.

FACTORS RELATED TO TIDAL SHORELINE STABILITY AND SENSITIVITY

The stability of a shoreline area and/or the associated implications of stable and unstable shorelines are related to many factors, including the following:

Fetch: Webster's New Collegiate Dictionary defines fetch as "the distance along open water or land over which the wind blows" and "the distance traversed by waves without obstruction." Essentially, the fetch is the distance that the wind blows across a body of water before it hits land. The fetch affects the momentum of wave action from a constant direction. The greater the fetch, the greater the potential force of wave action on the shoreline. Along Fairfax County's tidal shoreline, the fetch is particularly significant along the southern and western shores of the Mason Neck peninsula. As can be seen in Figure 28, much of this area is experiencing erosion.

Soils: Some soils are more highly erodible than others. Detailed soil maps are generally not available for the County's tidal shoreline; it is anticipated that this information will become available upon completion of the updated soil map for the County by the Natural Resources Conservation Service. However, five soil associations have been identified along the County's tidal shoreline within the U.S. Department of Agriculture's (Soil Conservation Service) 1963 General Soil Map of the County (see Figure 10).

Topography and Slope: In general, soil erodibility increases with slope gradient. Along the tidal shoreline, bluffs and other steeply sloping land is more susceptible to erosion and structural instability than is more gradually sloping land.

Runoff from Overland Flow: Related to topography and slope as well as land use and development, both sheet flow and concentrated runoff can serve to erode near-shore areas, thereby reducing their stability.

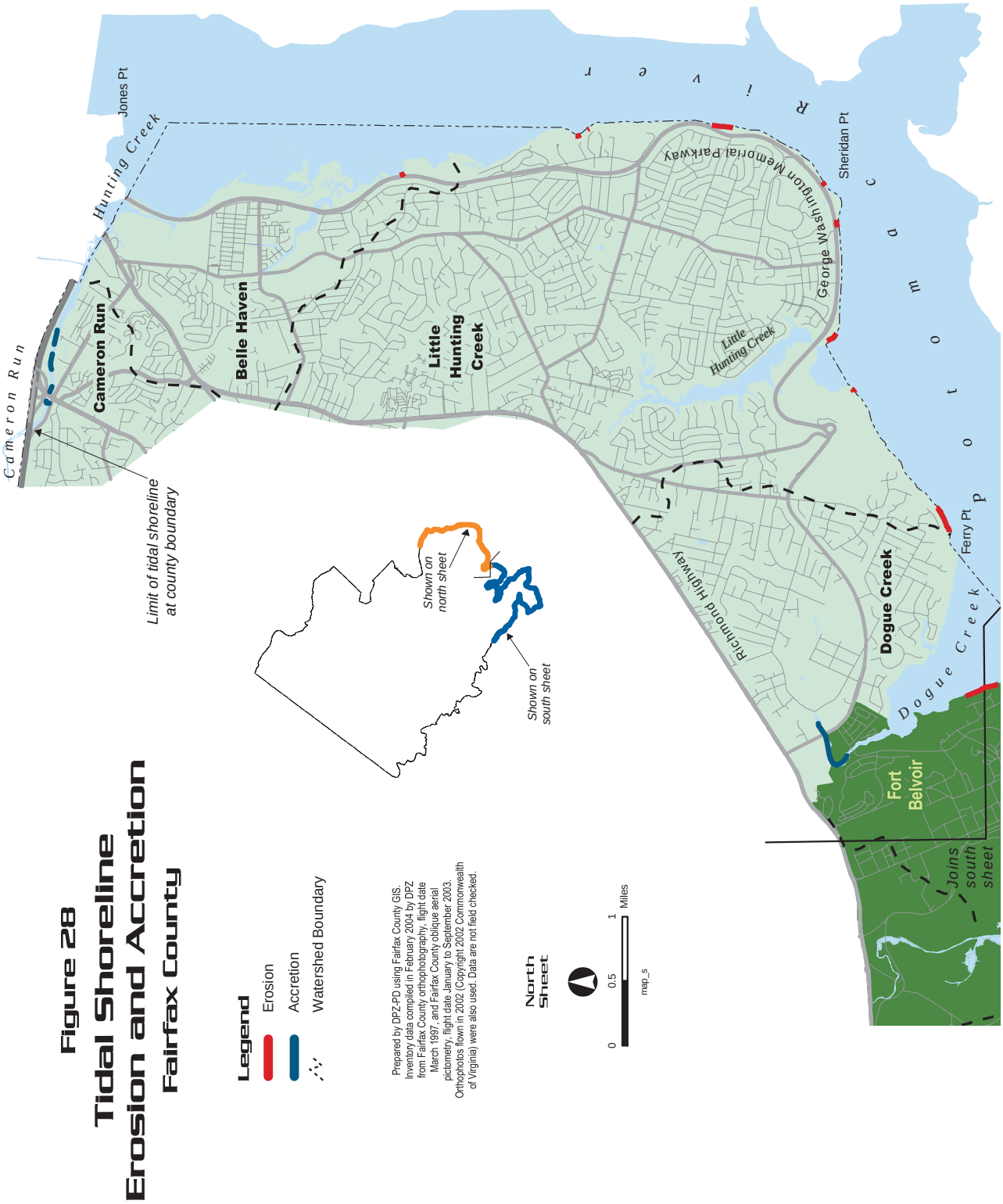
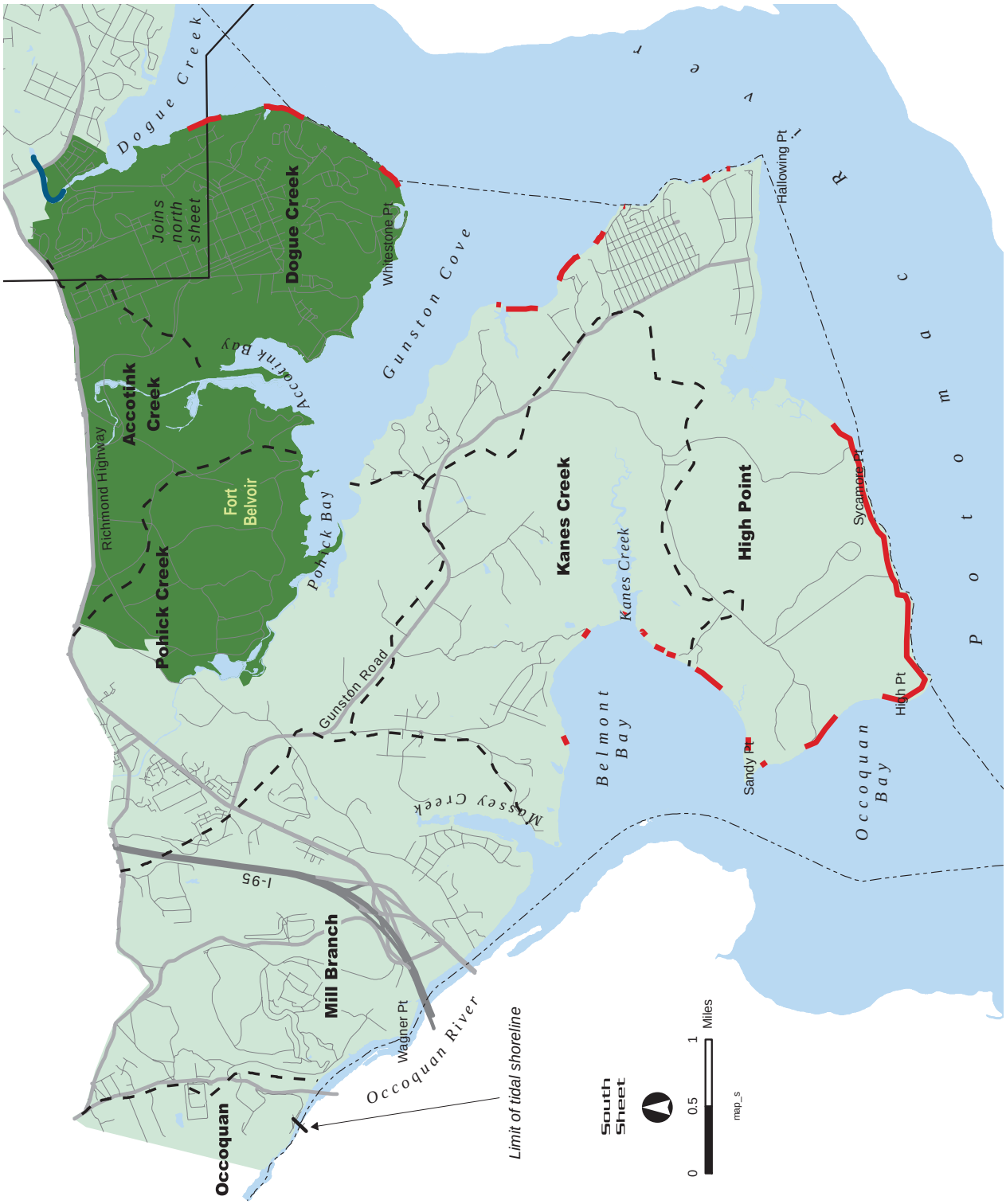


Figure 28
Tidal Shoreline
Erosion and Accretion
Fairfax County
Legend
Erosion
Accretion
Watershed Boundary
Prepared by DPZ-PD using Fairfax County GIS. Inventory data compiled in February 2004 by DPZ from Fairfax County orthophotography, flight date March 1997, and Fairfax County oblique aerial pictometry, flight date January to September 2003. Orthophotos (town in 2002 (Copyright 2002 Commonwealth of Virginia) were also used. Data are not field checked.
North Sheet
0
0.5
1
Miles
map_s
Shown on north sheet
Shown on south sheet
Limit of tidal shoreline at county boundary
Cameron Run
Cameron Run
Hunting Creek
Jones Pt
Belle Haven
Little Hunting Creek
Little Hunting Creek
George Washington Memorial Parkway
Sheridan Pt
Potomac River
Richmond Highway
Dogue Creek
Dogue Creek
Ferry Pt
Fort Belvoir
Joins south sheet


Dogue Creek
Joins north sheet
Dogue Creek
Whitestone Pt
Gunston Cove
Hallowing Pt
Potomac River
Accotink Bay
Accotink Creek
Richmond Highway
Fort Belvoir
Pohick Bay
Pohick Creek
Kanes Creek
Kanes Creek
High Point
Sycamore Pt
Gunston Road
Belmont Bay
Sandy Pt
High Pt
Occoquan Bay
Massey Creek
I-95
Mill Branch
Wagner Pt
Occoquan River
Occoquan
Limit of tidal shoreline
South Sheet
0
0.5
1
Miles
map_s

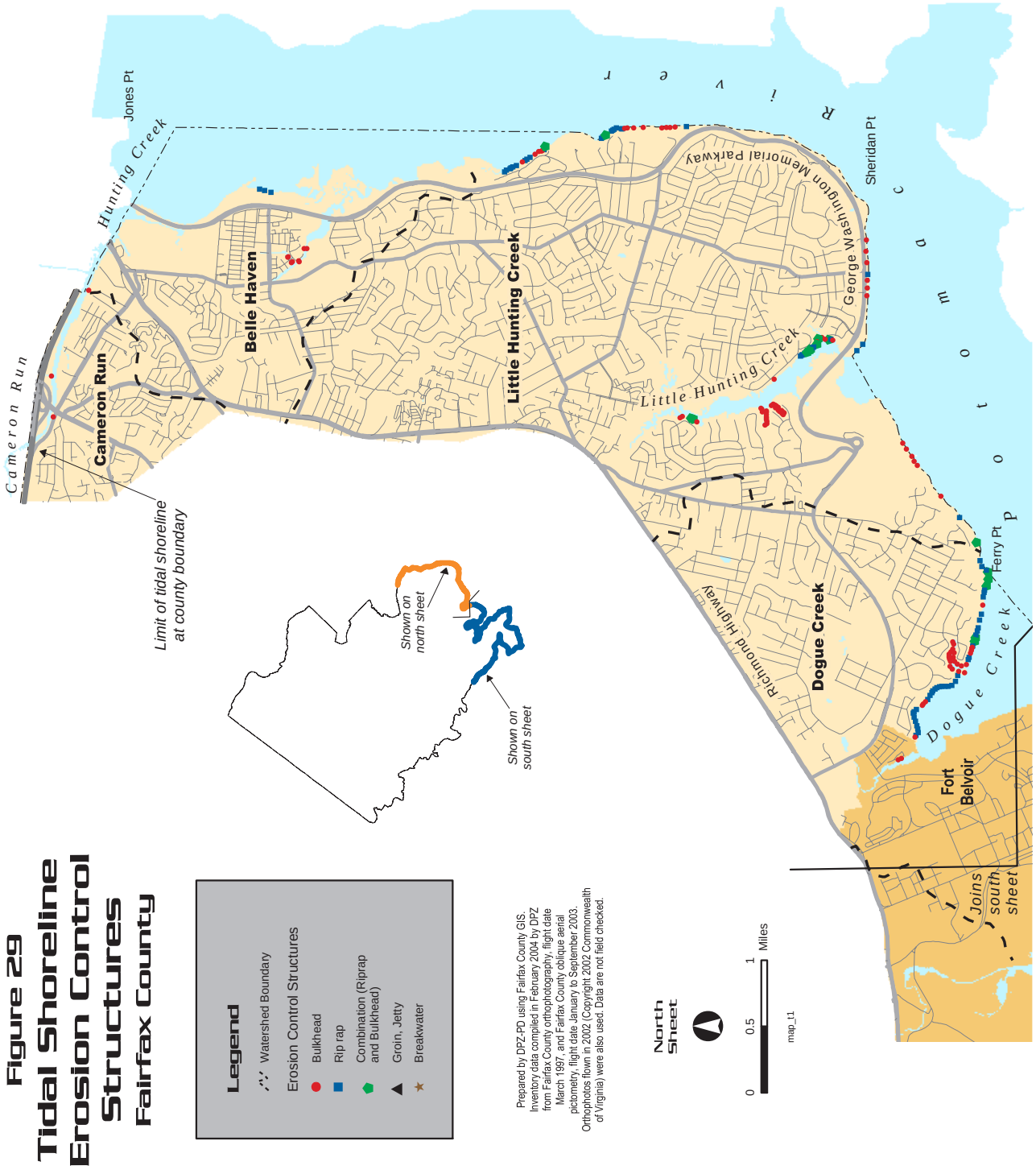
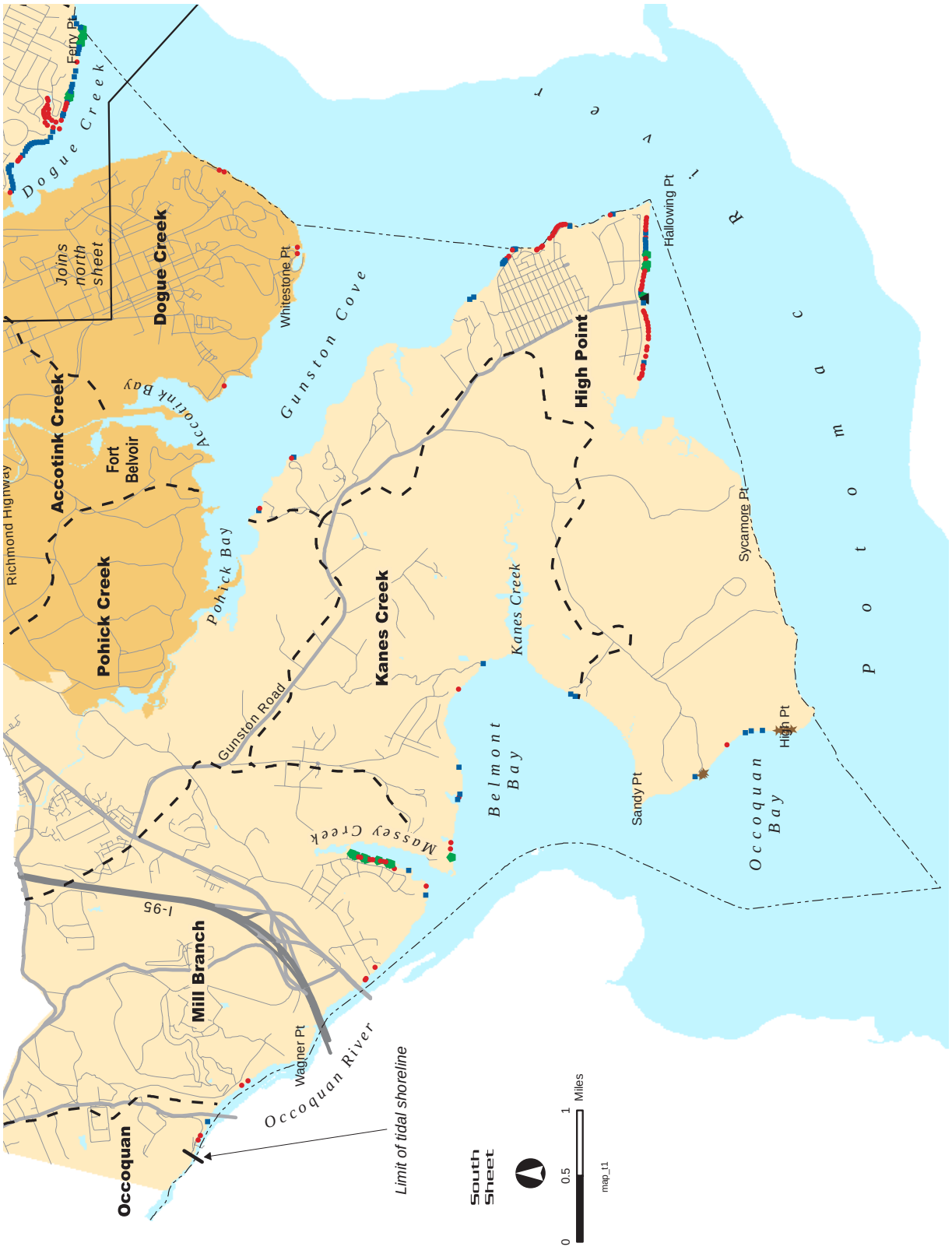


Figure 29
Tidal Shoreline Erosion Control Structures
Fairfax County


Dogue Creek
Ferry Pt
Joins north sheet
Dogue Creek
Whitestone Pt
Gunston Cove
Accotink Creek
Fort Belvoir
Accotink Bay
Richmond Highway
Pohick Creek
Pohick Bay
Kanes Creek
Gunston Road
Massey Creek
Belmont Bay
Kanes Creek
High Point
Hallowing Pt
Sycamore Pt
Sandy Pt
High Pt
Occoquan Bay
Potomac River
I-95
Mill Branch
Wagner Pt
Occoquan River
Occoquan
Limit of tidal shoreline
South Sheet
0
0.5
1
Miles
map_t1

Tidal Shoreline Erosion Control Structures Summary Table for Figure 29

(North and South Sheets)

Shoreline Erosion Control Structures By Type	Occurrences
Riprap	105
Bulkhead	182
Combination - Riprap and Bulkhead	29
Groin, Jetty	2
Breakwater	7
Total Structures	**325**

Prepared by DPZ-PD using Fairfax County GIS. Inventory data compiled in February 2004 by DPZ from Fairfax County orthophotography, flight date March 1997, and Fairfax County oblique aerial pictometry, flight date January to September 2003. Orthophotos flown in 2002 (Copyright 2002 Commonwealth of Virginia) were also used. Data are not field checked.

map_cl

Land Use and Development: Land use activities can affect the stability of a shoreline through the removal of vegetative cover that serves to protect a shoreline area from erosion. Man-made structures such as houses, utility lines, and roads can also be threatened by shoreline erosion, thereby increasing the "sensitivity" of a shoreline reach to erosion. The erosion of privately-owned yard areas can also increase pressures for artificial shoreline stabilization efforts, even if no homes or ancillary structures are threatened.

Artificial Shoreline Stabilization: Shoreline stability can be enhanced through artificial stabilization efforts; some of these efforts can rely on the planting of native species of vegetation, while others are "harder" approaches such as bulkheading and rip-rapping. Shoreline stabilization efforts along one reach of the shoreline can, however, potentially result in decreased stability of an adjacent reach and can adversely impact the habitat value of the shoreline environment. While Fairfax County is the most populous locality in Virginia, the pattern of land use along the County's tidal shoreline (with much of the shoreline in public ownership) has served to concentrate the provision of erosion control structures along a few shoreline reaches, as can be seen in Figure 29. Much of the County's shoreline remains free of erosion control structures; these structures tend to be concentrated along shoreline segments characterized by adjacent residential development.

Vegetation: The amount and type of vegetation landward or immediately adjacent to the shoreline can affect its erodibility. Vegetation can often be planted in order to enhance the stability of a shoreline reach.

Sea Level Rise: While obviously beyond local control, a rising sea level can increase shoreline erosion rates and decrease shoreline stability through increased wave action carried to higher, previously unaffected elevations along the shoreline.

Flooding and Storm Surges: Flooding is a natural occurrence along many tidal shoreline areas. However, the presence of man-made structures within areas that are susceptible to tidal flooding can increase the "sensitivity" of these near-shore areas to flooding and storm surge impacts, and storm surges and flooding can have a powerful and ultimately erosive effect on tidal shorelines. In Fairfax County, the 100-year floodplain associated with the tidal shoreline along the Potomac River and its tributary streams is at an elevation of ten feet above sea level in areas south of Old Towne Road (in the New Alexandria neighborhood) and an elevation of eleven feet above sea level in areas north of Old Towne Road to the County's border with the City of Alexandria. Most floodplain areas along the County's tidal shorelines remain free of residential, commercial, and industrial structures, and existing regulations should serve to perpetuate this condition. However, some of these areas were developed prior to the establishment of regulatory limitations. Of particular note are the Belle View and New Alexandria neighborhoods, which are located within the 100-year floodplain of the Potomac River. Two floodgates (one with a pumping station) have been constructed in this area on tributaries above Dyke Marsh to reduce the flooding from storms with a frequency less than the 100-year storm. Full protection from flooding associated with the 100-year frequency storm is not feasible. Redevelopment and infill development proposals in these established neighborhoods must receive Special Exception approval by the Board of Supervisors. Through this process, development conditions are routinely imposed in order to ensure that floodplain and structural impacts will be minimized, that requirements of the Federal Emergency Management Agency for floodproofing of commercial buildings and elevation of residential structures will be met, and that the requirements of the Virginia Uniform Statewide Building Code will be met.

AERIAL PHOTO ANALYSIS OF TIDAL SHORELINE CONDITIONS--SHORELINE EROSION AND EROSION CONTROL FINDINGS

The entire tidal shoreline analysis, divided into segments based on the locations of watershed boundaries, is presented in Appendix A. The shoreline reaches that are demonstrating active erosion consist of points of land exposed to the greatest fetch or long reaches of shoreline exposed to significant fetch. Most of the sites showing effects of erosion are located on public land and are not protected by artificial shoreline stabilization. Areas of the shoreline that are characterized by an adjacent residential land use correlate highly with shoreline stability and artificial shoreline stabilization structures.

Areas undergoing active erosion included the following: land on either side of Sheridan Point (along the George Washington Memorial Parkway); the shoreline immediately east of Ferry Point (along the Potomac River and Dogue Creek southwest of Mount Vernon); several areas on the Fort Belvoir shoreline (including two sites on the south shore of Dogue Creek that are exposed to winds out of the northeast and Whitestone Point on the north shore of Gunston Cove

on Fort Belvoir), and much of the Mason Neck peninsula. Tidal shoreline erosion appears to be particularly significant on the Mason Neck peninsula, as this peninsula had the greatest number and longest reaches of shoreline demonstrating erosion in the 2004 analysis. This finding is generally consistent with the findings reported by VIMS in the 1979 Shoreline Situation Report, although the lateral extent of the eroding shoreline has increased, most notably along the shoreline of Belmont Bay, and additional artificial shoreline stabilization structures have been constructed on the peninsula since 1979. The current findings also suggest that the tidal shoreline of the Mason Neck peninsula is the most dynamic tidal shoreline of Fairfax County despite the fact that little or no development has occurred in many places along the peninsula's shoreline.

Several of the shoreline reaches on the Mason Neck peninsula (within the Mason Neck State Park and the Mason Neck National Wildlife Refuge) appear to be undergoing the most significant erosion along the County's tidal shoreline. Several occurrences of active erosion were identified along the shoreline reach of Mason Neck facing Belmont Bay. A three hundred foot segment of shoreline adjacent to the Mason Neck State Park visitors' center on Belmont Bay was stabilized with riprap in 1999. However, additional areas of active erosion were cited in the 2004 evaluation that had been not cited in the 1979 Shoreline Situation Report. Artificial shoreline erosion control structures were not shown along the eroding reach of shoreline facing Occoquan Bay in the 1979 Shoreline Situation Report. However, the 2004 analysis revealed that a number of breakwaters and several areas of rip rap revetment had been placed along the Occoquan Bay side of the peninsula.

The residential area of Hallowing Point, located along the Potomac River shoreline in the southeastern portion of Mason Neck, is characterized by the same soil associations as those which are found along the eroding areas of Mason Neck State Park and the Mason Neck Wildlife Refuge. However, the segment of the shoreline that is adjacent to the Hallowing Point community is almost entirely stabilized with rip rap, bulkheads, or a combination of both. Shoreline stabilization structures appear to be effective, as no active erosion was noted along the Potomac River adjacent to the Hallowing Point area in either the 2004 analysis or in the 1979 Shoreline Situation Report.

Small areas of shoreline accretion were identified in the 2004 analysis along Cameron Run (perhaps as a result of sediment deposition associated with road construction in this area) and in a narrow segment of the tidal portion of Dogue Creek just south of Richmond Highway.

The following conclusions can be derived from this analysis regarding shoreline erosion:

- The watershed segments that appear to have the greatest amounts of erosion are the segments located in the Mason Neck State Park; Fort Belvoir; and certain areas along the George Washington Memorial Parkway;

- Shoreline reaches characterized by physical points of land exposed to the longest fetch are likely to have the greatest erosion; and

- The shoreline reaches with the greatest amounts of residential development – Little Hunting Creek, the east shore of Dogue Creek, the Hallowing Point neighborhood, the Harborview neighborhood- are areas with the greatest occurrence of artificial shoreline stabilization and least amounts of erosion.

SHORELINE ACCESS

INTRODUCTION

Efforts to preserve the cultural, historic, and environmental resources along the County's tidal shoreline have been pursued for many decades at the federal, state, regional, and local levels. A discussion earlier in this report makes note of Fairfax County's unique pattern of tidal shoreline ownership when compared with the rest of Virginia, with more than 60% of the County's tidal shoreline in some form of public ownership (compared with less than 1% statewide). Through efforts that have been pursued at all levels of government, ample access and opportunity for enjoyment of the tidal shoreline area is provided in Fairfax County.

Shoreline-related recreational opportunities and other recreational opportunities related to water resources in Fairfax County extend into nontidal areas of the County as well. The public ownership of much of the shoreline of the nontidal Potomac River and nontidal Occoquan Reservoir has been noted earlier. In addition, Fairfax Water has implemented a Shoreline Easement Policy that establishes what may be permitted within its flood easement immediately adjacent to and surrounding the Occoquan Reservoir.

The County's Park Authority owns more land in the County (over 23,000 acres) than any other single entity. Much of this land is located along the County's network of streams, which is estimated by the Park Authority to be an aggregate of 980 miles in length. The Park Authority's Stream Valley Park network contains approximately 7,000 acres of land located along 767 miles of streams. Through the application of the County's Environmental Quality Corridor (EQC) policy (described later in this document) and other acquisition efforts by the County's Park Authority, the stream valley park network will continue to grow.

The County's Policy Plan calls for the provision of a "comprehensive network of trails and sidewalks . . . as an integral element of the overall transportation network." The Countywide Trails Plan, which has been incorporated within the Comprehensive Plan, identifies a broad, interconnected network of trails proposed for areas throughout the County, including major regional trail systems such as the Mount Vernon Trail, the Washington and Old Dominion Trail, the Potomac Heritage National Scenic Trail (a proposed 704-mile trail that would link the Chesapeake Bay with the Allegheny Highlands in Pennsylvania), the Cross County Trail, and others. The Countywide Trails Plan also identifies many Stream Valley Trails, trails and sidewalks along major highways, and other paved and natural surface or stone dust trails. Approximately 1,600 miles of trails have been constructed in the County; Fairfax County Park

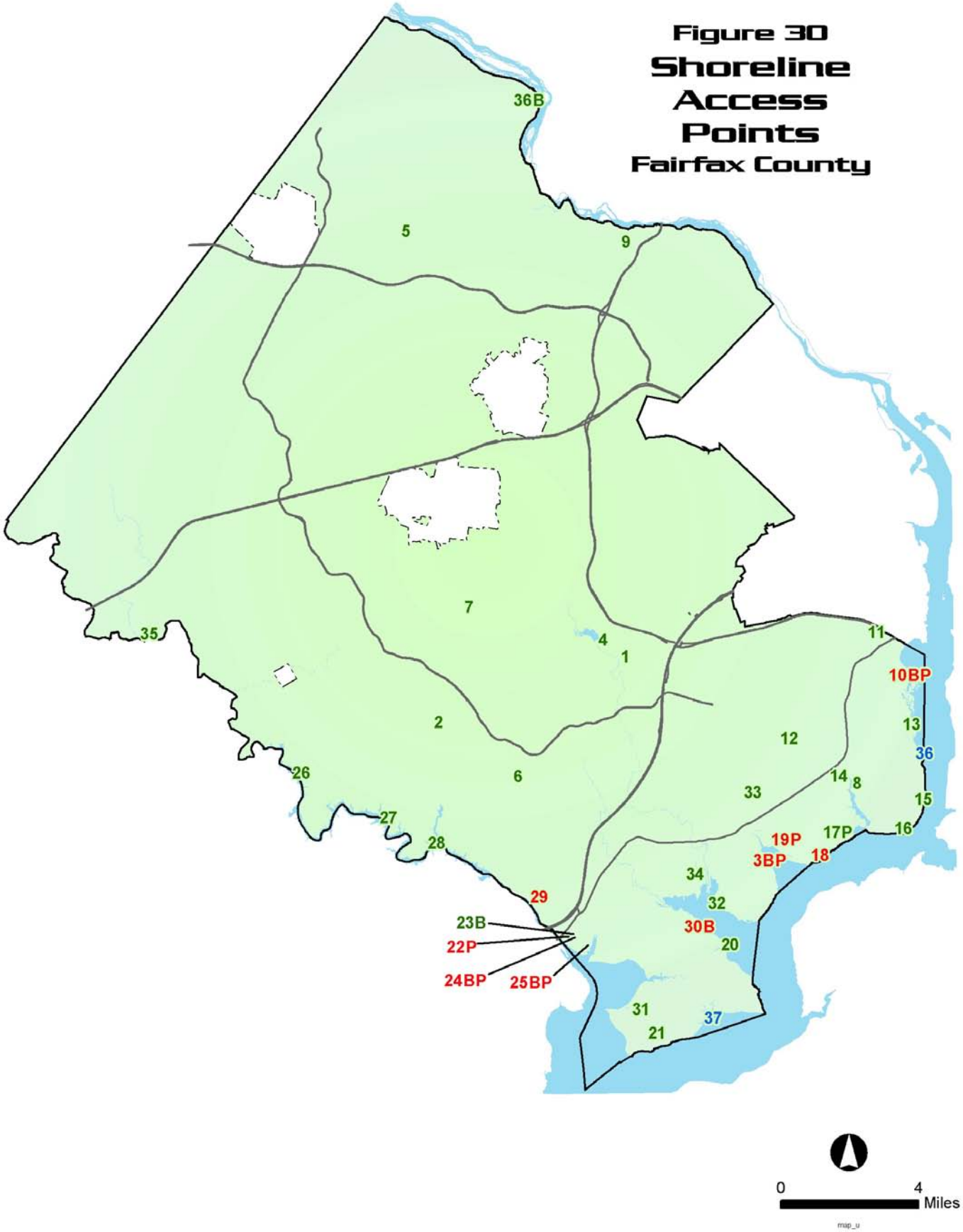


Figure 30
Shoreline
Access
Points
Fairfax County
36B
5
9
7
35
4
1
11
10BP
2
12
13
36
26
6
33
14
8
15
27
28
19P
17P
16
3BP
18
34
29
32
23B
30B
22P
20
24BP
25BP
31
37
21
0
4
Miles

Legend

(For Figure 30)

Symbology

General access points are shown in green	34
Tidal marinas are shown in red	29
Potential access areas identified in the Chesapeake Bay Public Access Plan, 1990 are shown in blue	37
Sites with boat ramps in tidal areas are designated with a "B" suffix	30B
Marinas with pump-outs are designated with a "P" suffix	22P

Description of Individual Sites

Tidal Marinas

Number	Site Name	Use	General Location
3BP	Dogue Creek Marina	Boat Ramp, Fishing, Boat Rental, Dry Storage	Fort Belvoir
10BP	Belle Haven Marina	Marina, Boat Launch, Fishing, Hiking	Alexandria
18	Mansion House Yacht Club	Marina	Alexandria
19P	Mount Vernon Yacht Club	Marina	Alexandria
22P	Fairfax Yacht Club, Occoquan River	Marina, Boat Launch, Fishing, Hiking	Mason Neck
24BP	Captain John's Beach Marina, Occoquan River	Boat Launch, Boat Ramp, Marina	Mason Neck
25BP	Harborview Marina	Marina	Massey Creek
29	Occoquan Regional Park	Marina, Boat Launch, Fishing	Mason Neck
30B	Pohick Bay Regional Park	Marina, Boat Ramp, Boat Rental, Fishing	Mason Neck

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General Access Points
(Including Non-tidal Marinas)

Number	Site Name	Use	General Location
1	Brookfield	Fishing	Springfield
2	Burke Lake and Golf Course	Boat Rentals, Fishing	Fairfax Station
4	Lake Accotink	Marina, Tour Boat, Boat Launch, Boat Rentals	Springfield
5	Lake Fairfax	Tour Boat, Boat Rentals, Fishing, Hiking	Reston
6	Lake Mercer	Fishing, Hiking	Fairfax Station
7	Lakeside	Fishing, Hiking	Fairfax Station
8	Little Hunting Creek	Hiking	Alexandria
9	Scotts Run Nature Preserve	Fishing, Hiking	McLean
11	Huntington Park	Hiking	Alexandria
12	Huntley Meadows Park	Wetland Walkway, Hiking	Alexandria
13	Dyke Marsh	Wetland Walkway, Hiking	Alexandria
14	Martin Luther King Jr. Park	Hiking	Alexandria
15	George Washington Memorial Parkway	Hiking	Mt. Vernon
16	Fort Hunt Park	Hiking, Biking	Mt. Vernon
17P	Mount Vernon on the Potomac (Mt. Vernon Ladies Association)	Tour Boat	Alexandria
20	Gunston Hall Plantation	Nature Study	Mason Neck
21	Mason Neck National Wildlife Refuge	Hiking, Biking, Canoe Rental	Mason Neck
23B	Colchester Dock, Occoquan River	Boat Launch, Boat Ramp, Fishing	Mason Neck
26	Bull Run Marina	Crew, Boat Launch, Hiking, Fishing	Clifton
27	Fountainhead Regional Park	Boat Launch, Marina, Boat Rental	Fairfax Station
28	Sandy Run Regional Park	Crew	Fairfax Station
31	Mason Neck State Park	Fishing, Hiking, Camping	Mason Neck
32	Tompkins Basin Area	Fishing, Hiking	Fort Belvoir
33	Jackson Miles Abbot Wildlife and Wetlands Refuge	Fishing, Hiking	Fort Belvoir
34	Accotink Bay Wildlife Refuge and Environmental Education	Fishing, Hiking	Fort Belvoir
35	Route 28 (Bull Run/NVRPA)	Fishing, Hiking, Canoeing	Centreville
36B	Riverbend Park	Fishing, Hiking, Boat Ramp, Nature Study	Great Falls

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Potential Access Areas in Fairfax County Identified in the Chesapeake Bay Public Access Plan, 1990

Number	Site Name	Public Access Plan Remarks
36	Northeastern Fairfax-Potomac River	"Publicly Accessible, Marina Slips & Boat Launch Area Needed"
37	Belmont Bay to Gunston Cove	"Publicly Accessible, Marina Slips & Boat Launch Area Needed"

Notes:

Tidal and non-tidal access points are both shown.

The Public Access Plan also identified a potential new marina at Fort Belvoir. However, Fort Belvoir is no longer proposing this marina. A potential access site was also identified at Colchester Dock, which is listed as site number 23 above.

Marinas equipped with a pump-out facility are registered with the Virginia Department of Health's Marina Program. Marinas with forty-nine slips or more are required to maintain such facilities. Marinas with less than forty-nine slips are participating voluntarily.

Information is not provided for the cities of Alexandria, Fairfax, and Falls Church, or for the towns of Clifton, Herndon, and Vienna. Prepared by DPZ - PD using Fairfax County GIS. Data are not field checked.

Sources:

1) *Register of Parks and Facilities 2000* (Fairfax County Park Authority)
2) *Public Access Guide - Chesapeake Bay, Susquehanna River, and tidal tributaries* (map, Chesapeake Bay Program, 2000)
3) *Regional Parks* (Web site, Northern Virginia Regional Park Authority)
4) *Chesapeake Bay Public Access Plan, 1990* (Chesapeake Bay Program)
5) *Chesapeake Bay Gateways - Map and Guide* (National Park Service and Chesapeake Bay Program, 2000)
6) Aerial Imagery Analysis, Fairfax County 1997, 2002, 2003 flights.
7) Claire Blanchard, Northern Virginia Regional Park Authority, Personal Communications.

Authority staff estimates that approximately 180 miles of trails provide hiking and bicycling access to stream valley areas.

Opportunities for passive (or "low impact") recreational access to the County's tidal shoreline and nontidal waters are abundant, and demands for such access are substantial as well. Citizen preference surveys that are periodically conducted by the Fairfax County Park Authority consistently show a high level of support for preservation of open space in the County. Open space areas provide great environmental benefits but also provide opportunities for passive recreation, such as trails and nature and cultural education programs. Efforts are expected to continue to preserve open spaces for environmental benefits and to provide passive recreation opportunities for current and future generations. With respect to more active recreational access along the tidal shoreline, there are a number of facilities providing public or broadly-available private boating access. An inventory of such facilities, compiled by County staff from a number of sources, is provided in Figure 30. The 2002 Virginia Outdoors Plan identifies a significant demand for water-based recreational opportunities (including facilities for boating) in Northern Virginia. The 1995 Potomac River Public Access Plan, prepared by the Northern Virginia Planning District Commission (now the Northern Virginia Regional Commission) reaches similar conclusions.

An analysis of Figure 30 indicates that the County is served by a significant number of marinas and boating related facilities. However, it must be noted that not all boating related tidal access facilities are identical to one another; some are equipped with sanitary sewage pump-out facilities, while some are not. Access to marinas that are equipped with such pump-out facilities is an important need for vessels that have on-board toilet facilities or that are capable of making trips of a long duration.

In 1992, Congress enacted the Clean Vessel Act (CVA) in order to reduce the vessel discharge of sewage into open waters. At the time CVA was adopted by Congress, competitive grant money was made available to facilitate and assist states in providing dumping stations for portable toilets as well as pump-out facilities for boaters. The Commonwealth of Virginia administers the Clean Vessel Act through the Virginia Department of Health's Marina Program. The program seeks to ensure that all marinas in the Commonwealth are equipped with appropriate sanitary waste disposal facilities. Marinas that have 49 boat slips or less are exempt from the requirement to maintain a pump-out facility. Marinas with fifty slips or more must maintain pump-out facilities, which are inspected by the state or local health department on an annual basis. Of the nine marinas located along the Fairfax County's tidal shoreline, six are equipped to meet the sanitary requirements as established by the Virginia Marina Program and the Clean Vessel Act and have been issued certificates to operate by the Virginia Department of Health. The remaining three marinas are exempt from the pump-out facility requirement.

AERIAL PHOTO ANALYSIS OF TIDAL SHORELINE CONDITIONS--POINTS OF ACCESS

As part of the aforementioned visual survey of the County's tidal shoreline using aerial orthophotography, the types, numbers, and locations of shoreline access structures (including piers, walkways, ramps, boathouses/gazebos/wharfs, and marinas) were noted, both on public

and private properties. The results of this analysis are presented in Figure 31. As expected, an analysis of the data reveals a strong correlation between shoreline access structures and adjacent residential land uses.

SITING OF NEW BOATING FACILITIES ALONG THE TIDAL SHORELINE

Figure 30 suggests that Fairfax County is relatively well served by marinas with tidal waterway accessibility and services. Further, there are a number of additional boating access points in Prince William County that are near Fairfax County and that may be used by County residents. However, the 1990 Chesapeake Bay Public Access Plan (prepared by the Chesapeake Bay Program) includes the following discussion:

- "Demand for recreational use of the Potomac River and its associated tidal estuaries is extremely high. The George Washington Memorial Parkway, along with the large publicly-owned lands located in the southeastern portion of the county, offer numerous opportunities for passive recreation. However, public boating access is limited. Where possible, appropriate specific access sites should be identified and provided.

- There is a need to find an additional boating access in the northeastern section of the county on the Potomac River or along its tributaries.

- Expansion of boating access or development of new facilities is needed on Belmont Bay and along the Potomac River to the Gunston Cove section of the river.

- Currently, the total capacity of commercial and public marina slips is approximately 550 slips. This number of slips does not meet the demand for the rapidly expanding population of the area. Most of these slips are at yacht clubs which serve only their members. Additional commercial slips are needed to help meet the demand for the general public's boater population."

The 2002 Virginia Outdoors Plan likewise identifies a significant need for water-based recreational activities in Northern Virginia, including facilities for swimming, boating, and fishing and the development of water trails. The report recommends that "boating, fishing and beach access to the Potomac and Occoquan Rivers should be increased significantly" and that the Belle Haven Marina be improved and continue to operate as "a popular and valuable amenity in an area lacking in water access sites."

Based on this published information, there is a clear demand for new or expanded public boating access along the County's tidal shoreline. However, the pattern of land use and ownership in this area will limit substantially the options available for siting new marinas and ramps. Land use and ownership patterns along the tidal shoreline have been largely established; much of the shoreline is in public ownership, and much of the privately owned component of the shoreline has been developed to the extent allowed by current zoning and to the extent recommended by

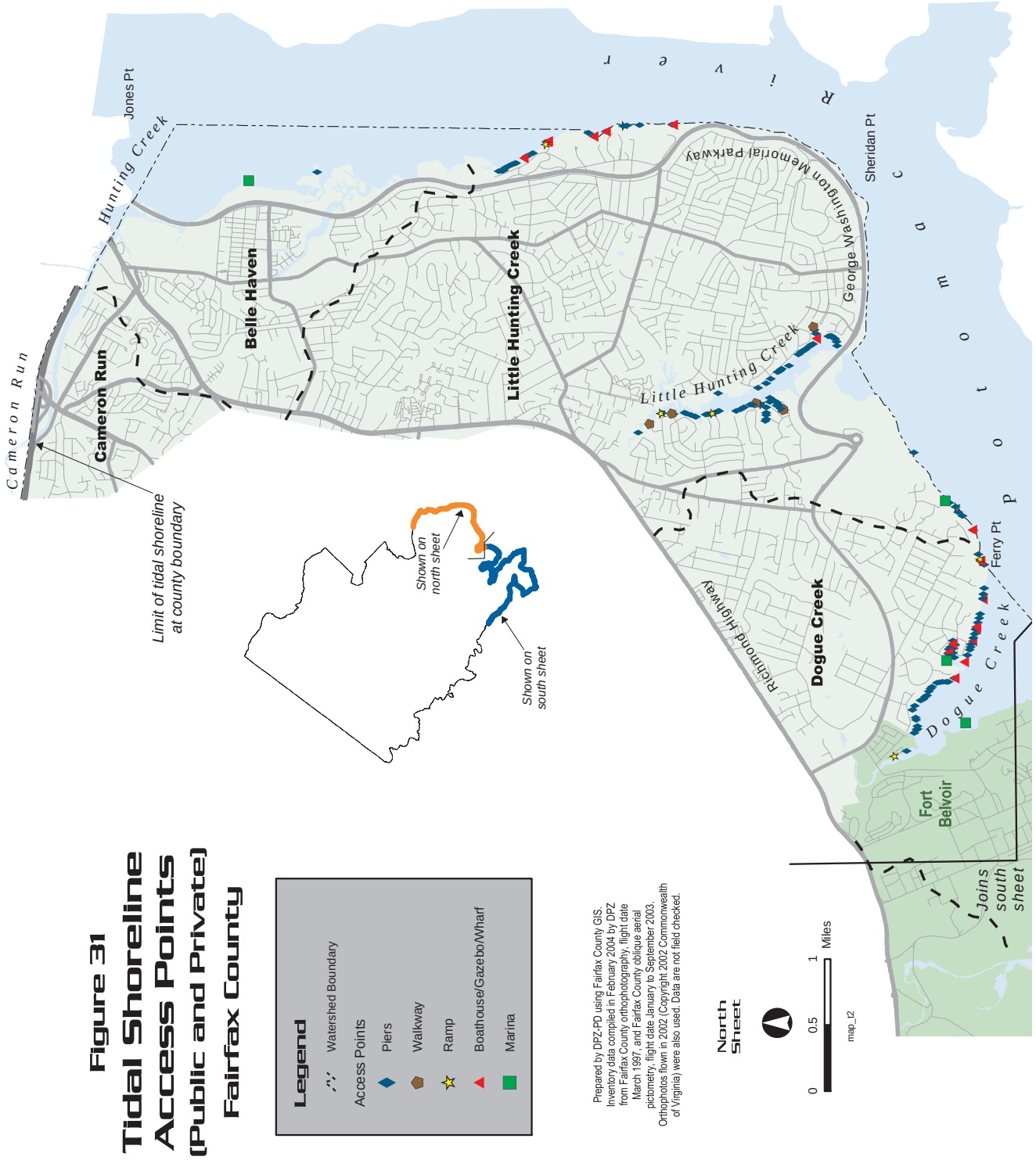
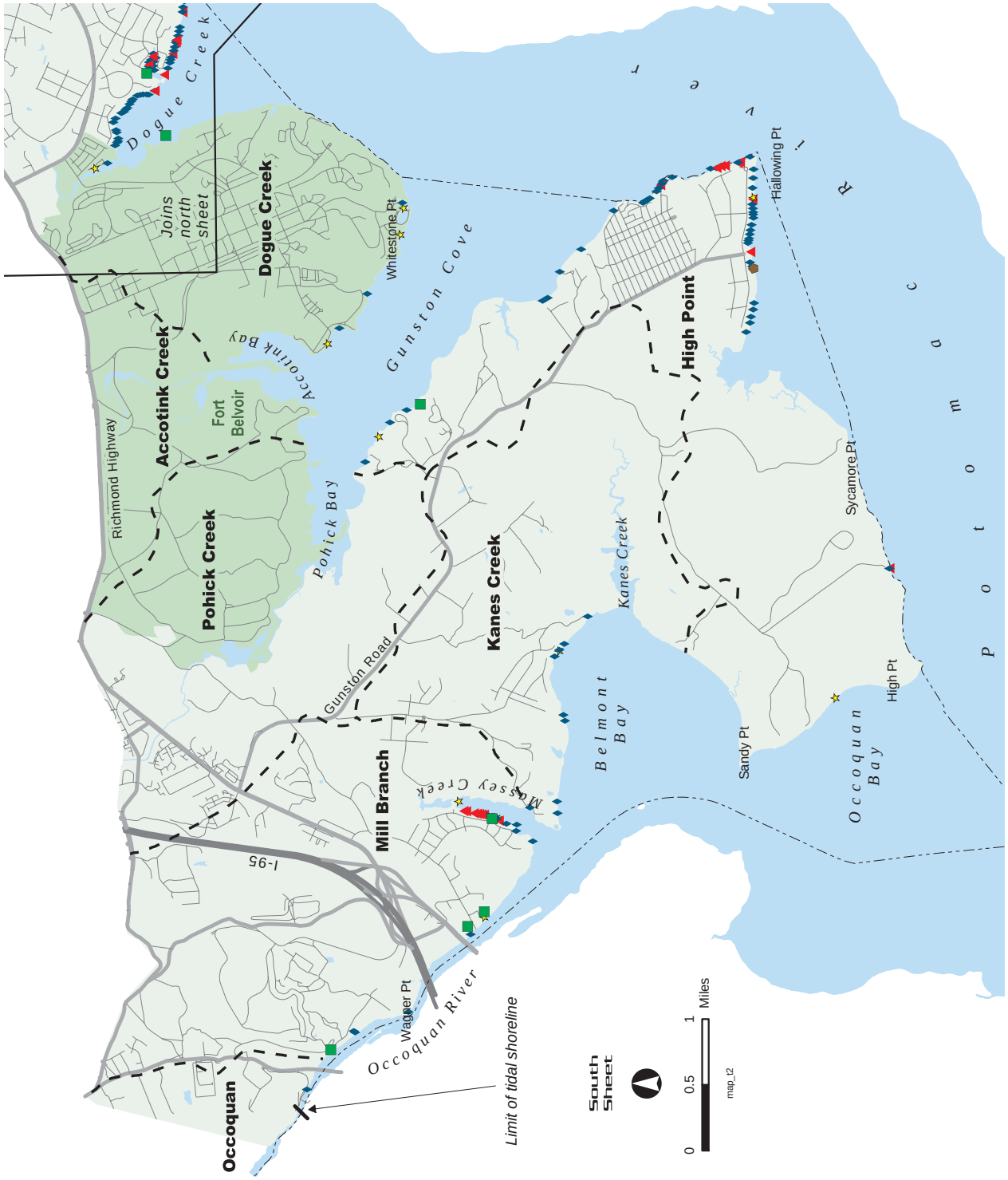


Figure 31
Tidal Shoreline Access Points (Public and Private)
Fairfax County
Legend
Watershed Boundary
Access Points
Piers
Walkway
Ramp
Boathouse/Gazebo/Wharf
Marina
Prepared by DPZ-PD using Fairfax County GIS. Inventory data compiled in February 2004 by DPZ from Fairfax County orthophotography, flight date March 1997, and Fairfax County oblique aerial pictometry, flight date January to September 2003. Orthophotos flown in 2002 (Copyright 2002 Commonwealth of Virginia) were also used. Data are not field checked.
North Sheet
0 0.5 1 Miles
map_12
Joins south sheet
Fort Belvoir
Dogue Creek
Ferry Pt
Richmond Highway
Dogue Creek
Little Hunting Creek
George Washington Memorial Parkway
Sheridan Pt
Little Hunting Creek
Belle Haven
Cameron Run
Cameron Run
Hunting Creek
Jones Pt
Limit of tidal shoreline at county boundary
Shown on north sheet
Shown on south sheet
Potomac River


Dogue Creek
Joins north sheet
Dogue Creek
Whitestone Pt
Gunston Cove
Accotink Bay
Accotink Creek
Fort Belvoir
Richmond Highway
Pohick Bay
Pohick Creek
Gunston Road
Kanes Creek
Kanes Creek
High Point
Hallowing Pt
Sycamore Pt
Potomac River
Belmont Bay
Massey Creek
Mill Branch
I-95
Sandy Pt
High Pt
Occoquan Bay
Wagner Pt
Occoquan River
Occoquan
Limit of tidal shoreline
South Sheet
0
0.5
1
Miles
map_12

Tidal Shoreline Access Points Summary Table for Figure 31

(North and South Sheets)

Shoreline Access Points By Type	Occurrences
Boat Ramps	22
Boathouse or Gazebo	33
Marina	12
Piers	214
Wetland Walkway	6
Wharf	1
Total Access Points	**288**

Prepared by DPZ-PD using Fairfax County GIS. Inventory data compiled in February 2004 by DPZ from Fairfax County orthophotography, flight date March 1997, and Fairfax County oblique aerial pictometry, flight date January to September 2003. Orthophotos flown in 2002 (Copyright 2002 Commonwealth of Virginia) were also used. Data are not field checked.

map_t2

the Comprehensive Plan. While it is possible that new marina facilities could be proposed on properties that have already been developed, it is more likely that such efforts would focus on properties that have not been developed or that have not been developed to their Comprehensive Plan potential ("underutilized" land). It is also possible that the National Park Service, U.S. Army, Commonwealth of Virginia, or Northern Virginia Regional Park Authority could, in the future, consider the provision of new boating access facilities on their properties. However, for state and federal properties, the processes through which these facilities could be developed would fall outside of the County's regulatory authority.

Figure 32 identifies vacant and underutilized privately-owned properties that are located near the tidal shoreline. As can be seen in this figure, such properties are not prevalent. Further, it is not likely that all of the "underutilized" parcels will be subject to future development; landowners may be content with their existing uses even though they could increase development densities on their properties. It should be noted that a number of the larger vacant and underutilized properties shown on the Mason Neck peninsula are located within County Agricultural and Forestal Districts, indicating that agricultural/forestry uses remain viable on these properties. Finally, it should be recognized that many of the vacant and underutilized parcels shown in Figure 32 would not meet, or would have difficulty meeting, Zoning Ordinance standards for commercial marinas, docks, and boating facilities (a two acre minimum lot size; a minimum 100-foot separation between structures and nonriparian lot lines; and a minimum 50-foot separation between off-street parking or loading spaces and adjacent residentially-zoned property).

Most of the vacant and underutilized parcels identified in Figure 32 are zoned either R-E (Residential Estate—one dwelling unit per two acres) or R-2 (two dwelling units per acre). Within both of these zoning districts, commercial marinas, docks, and boating facilities are allowed only through the approval of a Special Exception by the County's Board of Supervisors; private, nonprofit marinas, docks, and boating facilities are allowed only through the approval of a Special Permit by the County's Board of Zoning Appeals. Both of these processes involve a comprehensive review of development proposals for consistency with a broad range of Comprehensive Plan policies, including land use compatibility, environmental, and transportation policies. Both processes also require public hearings (two in the case of the Special Exception process—one before the Planning Commission and one before the Board of Supervisors). As such, a broad range of issues, including environmental and community concerns, will be considered for any proposal to establish a new commercial or nonprofit marina, dock, or other boating facility on private property in Fairfax County.

General guidance on the siting of boating access facilities has been developed by the Virginia Marine Resources Commission (VMRC) as well as by the Chesapeake Bay Program (in its Public Access Technical Report). The "General Siting Criteria" in VMRC's Subaqueous Guidelines include the following:

- "The physical dimensions and characteristics of the water body should be compatible with the size of the marina and the type of vessels it will house…"

- "Marinas must have sufficient upland areas to provide all the necessary parking, stormwater management BMP's, fuel, and sanitary facilities without filling wetlands or subaqueous bottom."

- "All marinas should be located in areas with good natural flushing to minimize the build-up of organic material and other pollutants on the bottom."

- "Marinas should not be sited close to areas of very high natural resource value . . ."

- "Projects that by their cumulative impact will result in dense concentrations of boats in one area will be critically evaluated as to their impacts on natural resources; however, in densely populated areas, concentration of slips in a single facility must be justified to prevent disturbance at undeveloped shorelines."

The Center for Coastal Resources Management of the Virginia Institute of Marine Science worked with a team of planners, environmental regulators, scientists, and geographic information experts to develop an algorithmic tool known as the "Marina Suitability Tool." This interactive tool uses the VMRC marina siting guidance and provides a ranking system for locating marinas based on a number of important criteria, such as the presence or absence of submerged aquatic vegetation, shellfish beds, wetlands, and riparian forests. Ultimately, the ranking system generates an evaluation of habitat, water quality, and design as well as a cumulative evaluation of these three parameters. While this tool can assist in the evaluation of site suitability for new marina facilities, it is not intended to serve as a substitute for an on-site physical inspection and

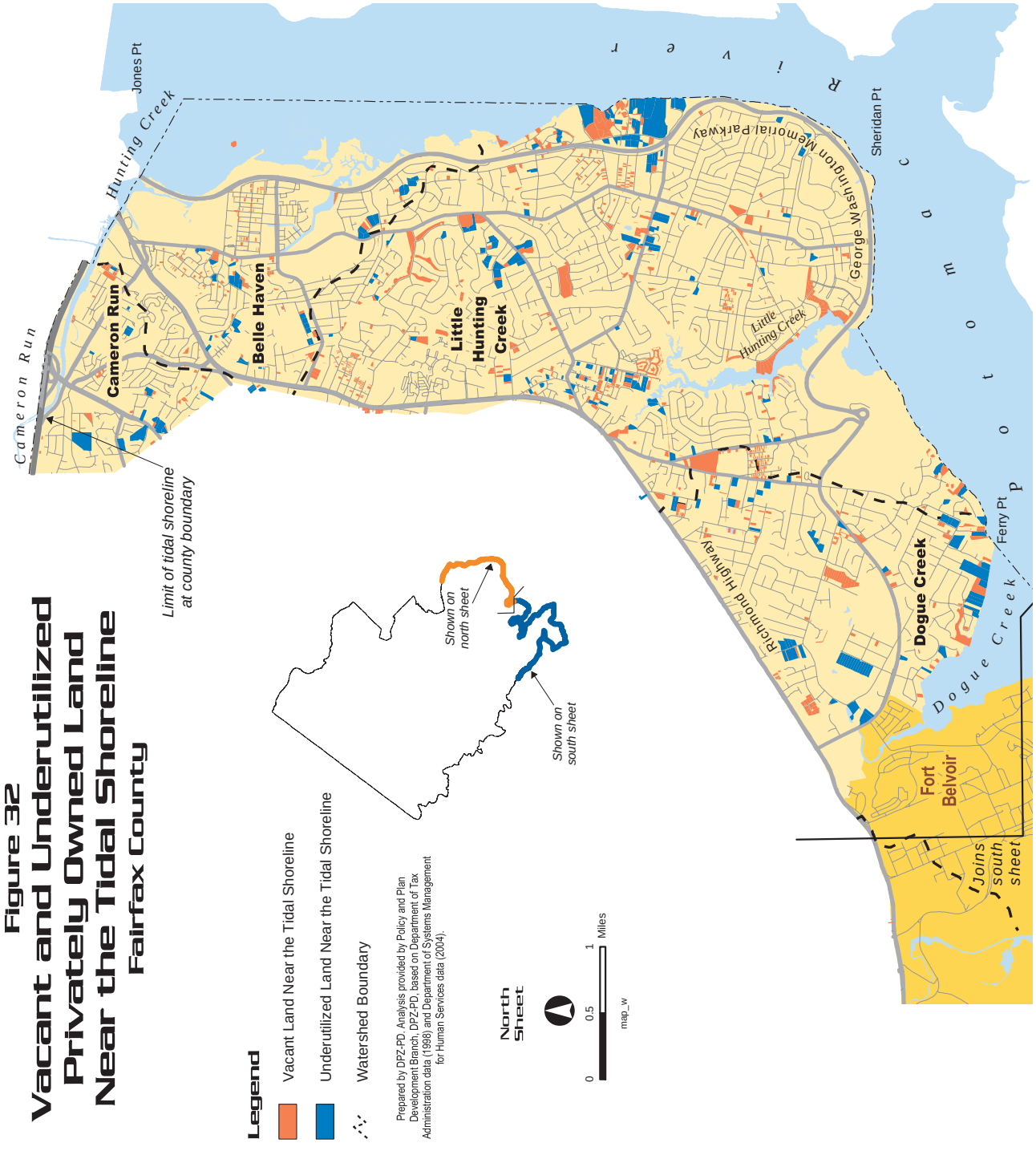
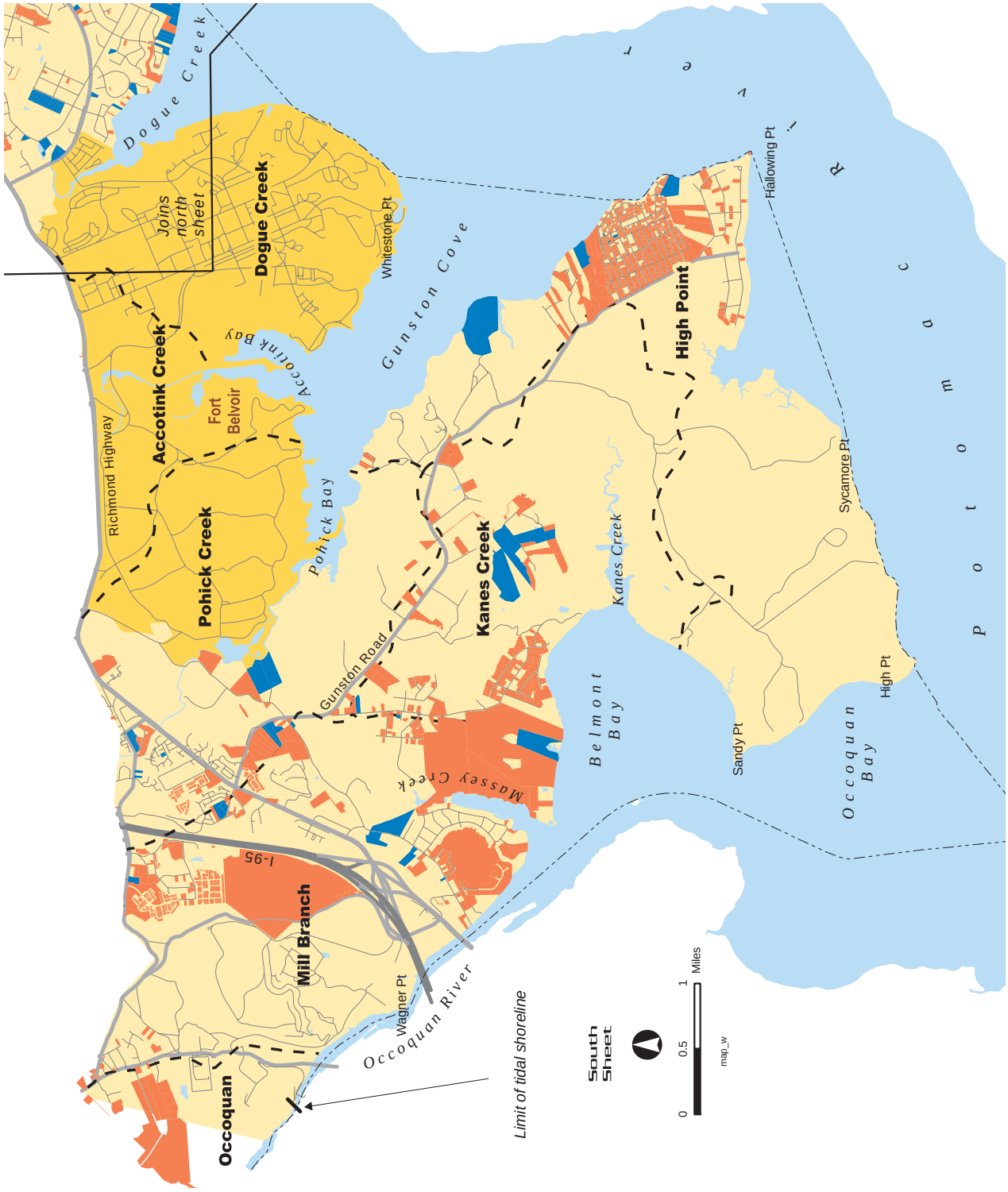


Figure 32
Vacant and Underutilized Privately Owned Land Near the Tidal Shoreline
Fairfax County
Legend
Vacant Land Near the Tidal Shoreline
Underutilized Land Near the Tidal Shoreline
Watershed Boundary
Prepared by DPZ-PD. Analysis provided by Policy and Plan Development Branch, DPZ-PD, based on Department of Tax Administration data (1998) and Department of Systems Management for Human Services data (2004).
North Sheet
0
0.5
1
Miles
map_w
Shown on north sheet
Shown on south sheet
Limit of tidal shoreline at county boundary
Cameron Run
Cameron Run
Hunting Creek
Jones Pt
Belle Haven
Little Hunting Creek
Little Hunting Creek
George Washington Memorial Parkway
Sheridan Pt
Richmond Highway
Dogue Creek
Dogue Creek
Ferry Pt
Fort Belvoir
Joins south sheet
Potomac River


Dogue Creek
Joins north sheet
Dogue Creek
Accotink Creek
Fort Belvoir
Accotink Bay
Richmond Highway
Pohick Creek
Pohick Bay
Whitestone Pt
Gunston Cove
Kanes Creek
Gunston Road
Massey Creek
Mill Branch
I-95
Wagner Pt
Occoquan
Occoquan River
Limit of tidal shoreline
South Sheet
0
0.5
1
Miles
map_w
Belmont Bay
Kanes Creek
High Point
Hallowing Pt
Sycamore Pt
Sandy Pt
High Pt
Occoquan Bay
Potomac River

evaluation. The "Marina Suitability Tool" can be accessed on the Center's Web site at: http://ccrm.vims.edu/mgttools.html.

The Chesapeake Bay Program's "Chesapeake Bay Area Public Access Technical Assistance Report" contains guidelines to assist localities in the siting and design of new boating access facilities as well as guidelines addressing other forms of shoreline access, such as beach/swimming areas, pier and bank fishing access, and access to natural areas. The focus of the guidelines addressing boating access is on launch ramps as opposed to marina facilities, although some considerations are related to marinas (e.g., sewage disposal facilities). A series of environmental considerations (including but not limited to topography, shoreline erosion conditions, soils and substrate materials, wave characteristics, significant habitat areas, water quality impacts, wetlands, cultural resources, and submerged aquatic vegetation) is identified, as are lists of desirable and undesirable site characteristics that focus both on environmental considerations and vehicular access concerns. Guidance addressing site design issues including area requirements, water depth and subsurface conditions, vehicular considerations, pedestrian considerations, sewage disposal facilities, and stormwater management, among other items, is also provided. ■