

SUBSHED 905

SUBSHED 910

SUBSHED 915

SUBSHED 10

SUBSHED 20

CATON HILL RD

PRINCE WILLIAM PKWY

I-95

OBITZ BLVD

JEFFERSON DAVIS HWY

RIPPON BLVD

VETERANS DR

915-CZIP-01

915-CZIP-02

20-CZIP-03

20-CZIP-04

**Marumsco Creek and Farm
Creek Watershed Coastal
Zone Improvement Projects**

0 1,300 2,600 5,200 7,800 10,400 Feet



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 915-CZIP-01

Stream: Marumsko Creek

Subshed: 915

Type: Coastal Marsh

Enhancement

Size/Length: 183 LF

Location: Marumsko Creek east of tennis courts and Veterans Drive in Veterans Memorial Park

Land Ownership:

United States of America

800 Bay St

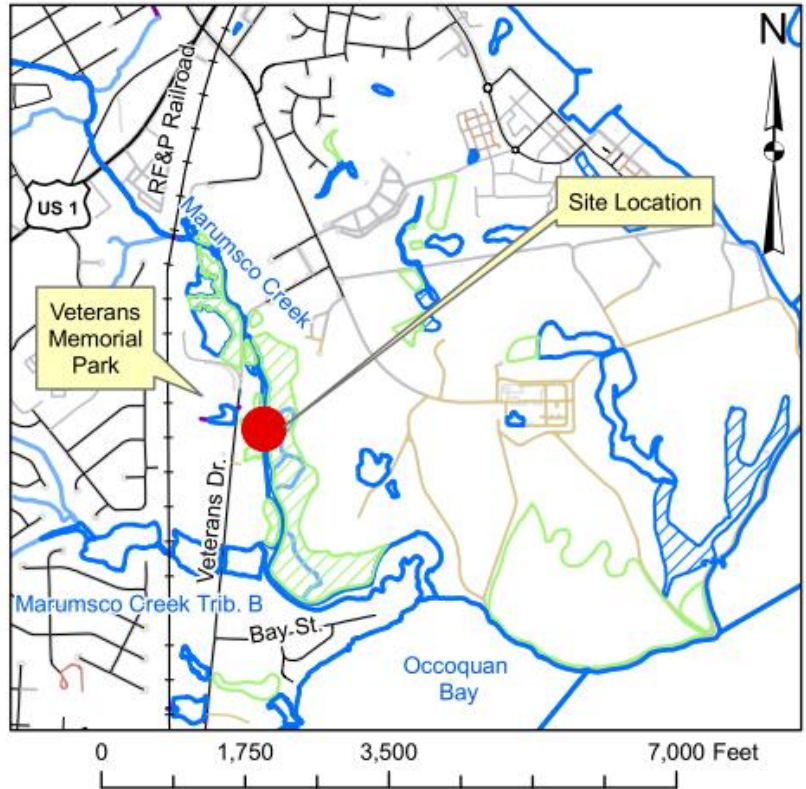
GPIN: 8491-18-2953

PWC Park Authority

Veterans Memorial Park

14300 Veterans Drive

GPIN: 8492-00-2786



PROJECT VICINITY MAP

Problem Description:

Coastal Zone Enhancement (5D-915-108CZ)

In this area of Marumsko Creek, a limited area of the shoreline of the creek is slightly degraded along the nature trail through the park. The degradation portion of the shoreline provides an opportunity to enhance the aquatic habitat of the stream and provides a potential community involvement project.

Project Concept

Submerged Aquatic Vegetation Planting and Breakwater Construction

The project concept for this site involves the establishment of a soft breakwater structure with submerged aquatic vegetation (SAV) plantings between the breakwater and the shoreline. The soft breakwater structure is proposed to be constructed from coir fiber logs anchored to the channel bed. Types of SAV that can be considered for planting behind the breakwater include Eurasian watermilfoil, wild celery or eelgrass (depending on water salinity), sago pondweed, and horned pondweed. Additionally, small mudflats in the area can be enhanced with wetland plantings and existing nearby SAV areas are to be protected by installation of the breakwater.

Project Benefits

Aquatic Habitat

The coir fiber logs will provide protection to the new SAV plantings from strong currents and wave attack and will provide habitat for aquatic species of macroinvertebrates, reptiles, and fish. The SAV planting provide additional habitat and food sources for many of the animal species which inhabit the Chesapeake Bay region including fish species such as shad, herring and rockfish.

Water Quality

Submerged aquatic plants can help improve water quality by utilizing dissolved nitrogen and phosphorous for plant growth. By withdrawing the nutrients from the water, they make them unavailable for use by algae thus reducing the contributions of local storm water runoff to algal blooms.

Project Cost:

Design Cost: No design fee

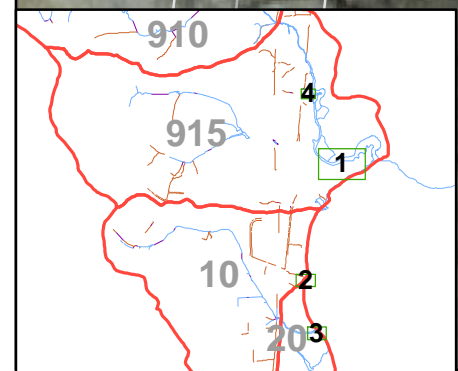
Construction Cost: \$5,490

915-CZIP-01



Legend

- Existing SAV Plantings
- New SAV Plantings
- Beach Nourishment
- Stream Stabilization
- New Wetland Plantings
- Parcels
- Wetlands
- Stream
- Stone Jetty
- Soft Backwater Structure
- Coastal Zone
- Coastal Zone Characterization



0 4 8 16 24 32 Feet

1 inch equals 30 feet

**Marumsko Creek and
Farm Creek Watershed
Coastal Zone
Improvement Project**

5D-915-108CZ

Right bank of Marumsco Creek
along the hiker trail in Veterans
Memorial Park.
6/30/2009



5D-915-108CZ

Right bank of Marumsco Creek
along the hiker trail in Veterans
Memorial Park.
6/30/2009



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 915-CZIP-02

Stream: MarumSCO Creek

Subshed: 915

Type: Coastal Marsh

Enhancement

Size/Length: 1,000 LF

Location: MarumSCO Creek north of Bay Street behind residential properties.

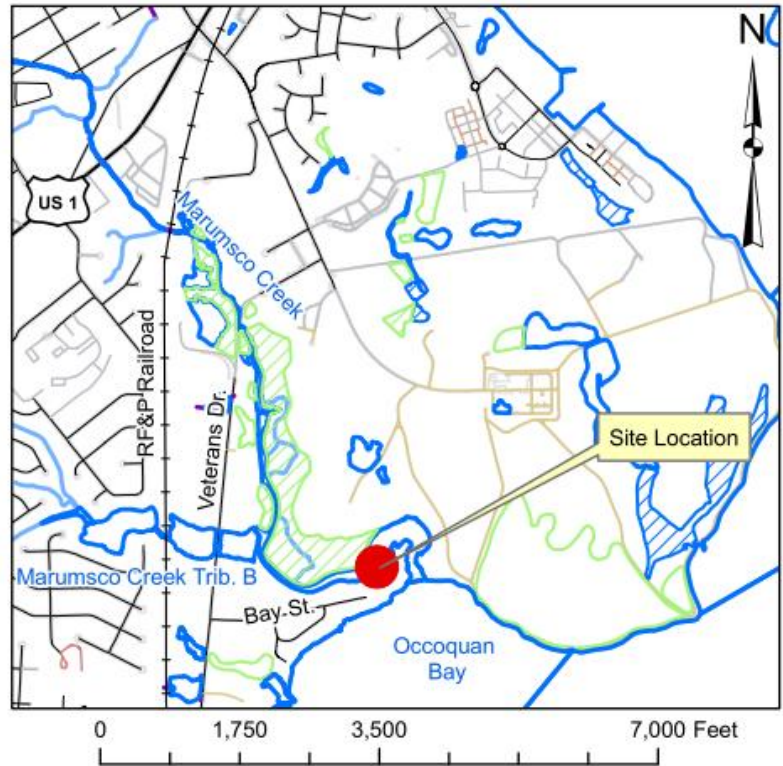
Land Ownership:

United States of America

800 Bay St

GPIN: 8491-18-2953

*Site access may require acquisition of a construction access easement from a private property owner. Selection of appropriate property should be made in the design phase.



PROJECT VICINITY MAP

Problem Description:

Coastal Zone Enhancement (5E-915-111CZ & 112CZ)

In this area of MarumSCO Creek, minimal buffer exists along the right streambank between the tidal portion of the creek and the private property. Degradation of the shoreline in this area has impaired habitat for native species of macroinvertebrates, reptiles, fish, and birds in this area. Additionally, the lack of a vegetated buffer allows for untreated stormwater runoff from the residential lawns to directly enter MarumSCO Creek.

Project Concept

Submerged Aquatic Vegetation Planting and Breakwater Construction

The project concept for this site involves the establishment of a soft breakwater structure with submerged aquatic vegetation (SAV) plantings between the breakwater and the shoreline. The soft breakwater structure is proposed to be constructed from coir fiber logs anchored to the channel bed. Types of SAV that can be considered for planting behind the breakwater include Eurasian watermilfoil, wild celery or eelgrass (depending on water salinity), sago pondweed, and horned pondweed.

Project Benefits

Aquatic Habitat

The coir fiber logs will provide protection to the new SAV plantings from strong currents and wave attack and will provide habitat for aquatic species of macroinvertebrates, reptiles, and fish. The SAV planting provide additional habitat and food sources for many of the animal species which inhabit the Chesapeake Bay region including fish species such as shad, herring and rockfish.

Water Quality

Submerged aquatic plants can help improve water quality by utilizing dissolved nitrogen and phosphorous for plant growth. By withdrawing the nutrients from the water, they make them unavailable for use by algae thus reducing the contributions of local storm water runoff to algal blooms.

Project Cost:

Design Cost: \$8,000

Construction Cost: \$30,000

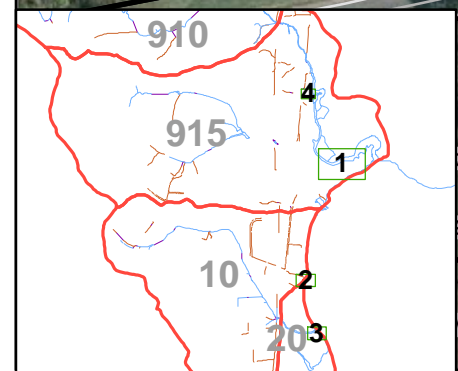
Total Cost: \$38,000

915-CZIP-02



Legend

- Existing SAV Plantings
- New SAV Plantings
- Beach Nourishment
- Stream Stabilization
- New Wetland Plantings
- Parcels
- Wetlands
- Stream
- Stone Jetty
- Soft Backwater Structure
- Coastal Zone
- Coastal Zone Characterization



0 25 50 75 100 Feet

1 inch equals 100 feet

**Marumso Creek and
Farm Creek Watershed
Coastal Zone
Improvement Project**

5E-915-112CZ

Right bank of Marumsco Creek behind Bay Street.

6/30/2009



5E-915-112CZ

Right bank of Marumsco Creek behind Bay Street.

6/30/2009



5E-915-112CZ

Right bank of Marumsco Creek behind Bay Street.

6/30/2009



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 20-CZIP-03

Stream: Occoquan Bay

Subshed: 20

Type:

Beach Nourishment

Size/Length: 290 LF

Location: Occoquan Bay near
Tornai Court cul-de-sac

Land Ownership:

Heritage Harbor Community
Association

1252 Marseille Lane

GPIN: 8491-04-4239

Heritage Harbor Community
Association

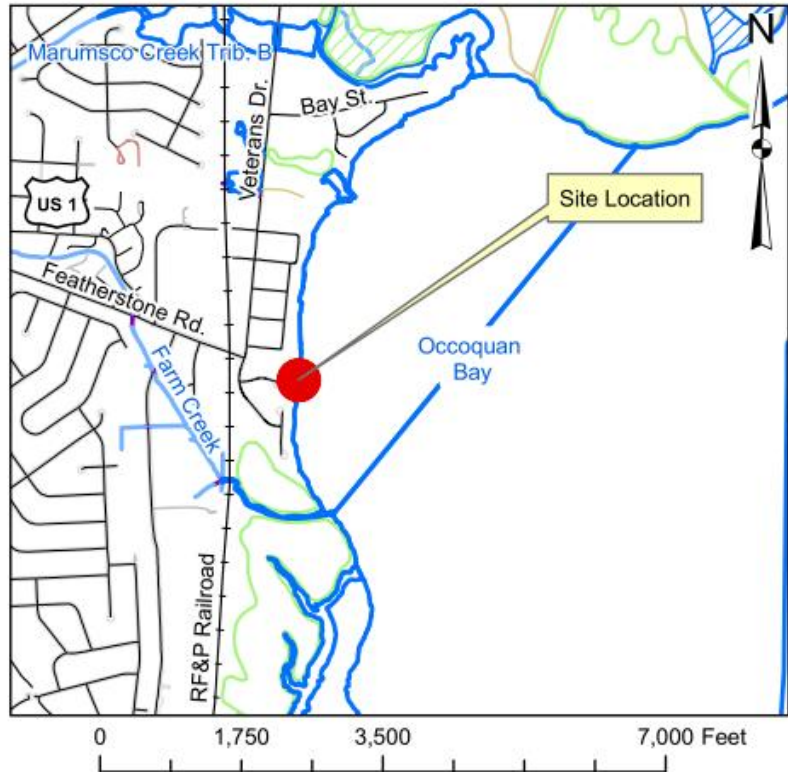
15000 Boaters Cove Place

GPIN: 8491-03-1957

David & Carol Moore

14815 Bayview Dr

GPIN: 8491-04-3160



Problem Description:

Coastal Zone Enhancement (7D-20-04CZ)

This area is one of the few shorelines of the Occoquan Bay in this area that has not been artificially stabilized with wooden bulk head. Currently a limited beach front exists along the shoreline. The limited beach area has two storm drain outfalls that flow onto it and are bounded on both ends by timber boat docks. The southern end of the project is bounded by a concrete boat ramp.

PROJECT VICINITY MAP

Project Concept

Beach Nourishment

The project concept for this project site involves construction of a stone jetty along the southern boundary of the project and beach nourishment through sand pumping / placement along the nourishment area as shown. The stone jetty placement will allow for stabilization of the created beachhead and will prevent long-shore currents from pushing sands from the beach into the dock and boat ramp areas. Additionally, proper design of the jetty system along with presence of a sufficient sand sediment supply in the Occoquan Bay system will allow for the created beach system to be self-sustaining.

Project Benefits

Infrastructure Protection

Creation of a beach head creates a natural energy dissipation barrier along the shoreline of the Occoquan Bay. The energy dissipation barrier breaks-up storm generated wave energy through depth limiting effects away from the shoreline, as opposed to current conditions where storm generated waves break against the bulkhead causing an increased potential for damage or destruction of the bulkhead and loss of land behind the bulkhead.

Aquatic Habitat Restoration

Recreated beaches can provide habitat, nesting and spawning areas for turtles, horseshoe crabs, least terns, and piping plover within the Chesapeake Bay region.

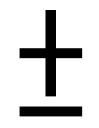
Project Cost:

Design Cost: \$150,000

Construction Cost: \$348,000

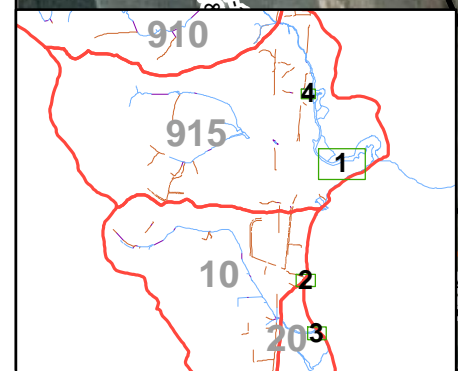
Total Cost: \$498,000

20-CZIP-03



Legend

-  Existing SAV Plantings
-  New SAV Plantings
-  Beach Nourishment
-  Stream Stabilization
-  New Wetland Plantings
-  Parcels
-  Wetlands
-  Stream
-  Stone Jetty
-  Soft Backwater Structure
-  Coastal Zone
-  Coastal Zone Characterization



0 5 10 20 30 40 Feet

1 inch equals 40 feet

**Marumsko Creek and
Farm Creek Watershed
Coastal Zone
Improvement Project**

7D-20-04CZ

Limited beach area along the Occoquan Bay shoreline. Photo taken at high tide.
6/30/2009



7D-20-04CZ

Limited beach area along the Occoquan Bay shoreline. Photo taken at low tide.
8/20/2009



MARUMSCO CREEK AND FARM CREEK WATERSHED MANAGEMENT PLAN

Stream Corridor Improvement Project

Project ID: 20-CZIP-04

Stream: Occoquan Bay

Subshed: 20

Type:

Beach Nourishment

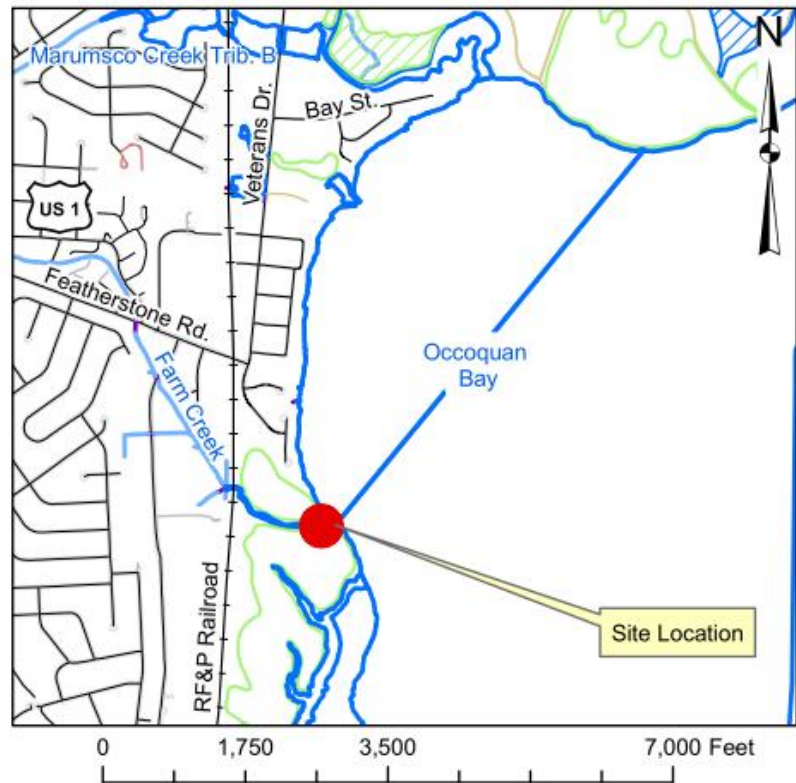
Size/Length: 290 LF

Location: Occoquan Bay near
Tornai Court cul-de-sac

Land Ownership:

United States of America Fish
and Wildlife Administration
1181 Marseille Lane
GPIN: 8491-03-2516

* Project site will require
access via boat and barge.



PROJECT VICINITY MAP

Problem Description:

Coastal Zone Enhancement (7D-20-01CZ)

The right streambank of Farm Creek is eroding in this area. The bank erosion is estimated to be 4 feet high above the high tide level. A few trees have been undermined by the erosion and are falling into the estuary.

Project Concept

Stream Bank Stabilization

The project concept for this project site involves stabilization of the streambank through grading and bioengineering / bank plantings.

Project Benefits

Stream Stabilization

Stabilization of the eroded streambank will provide water quality, natural resource conservation, and aquatic habitat conservation benefits for the Occoquan Bay. These benefits include:

Water Quality – Stabilization of the stream will reduce the current sediment loading that is being produced through this reach and impacting the bay. The introduction of additional TSS into the bay will increase the water’s turbidity, blocking sunlight and impacting submerged aquatic plant production. Additionally, nutrients from the soil

that dissolve into the water column can be used to increase the reproduction of algae, further stressing the submerged aquatic plant population.

Natural Resource Conservation – Natural resources in the area are currently endangered or impacted by this destabilized system. Bank erosion is leading to the undermining and felling of trees, which in turn will lead to additional bank instabilities.

Aquatic Habitat Conservation – As previously noted, the erosion along the streambank is supplying TSS and nutrients to the tidal portion of Farm Creek and the Occoquan Bay. The TSS and nutrient contributions are potentially stressing submerged aquatic plants and thus stressing the habitat and food supply for native fish and crab species.

Project Cost:

Design Cost: \$80,000

Construction Cost: \$150,000

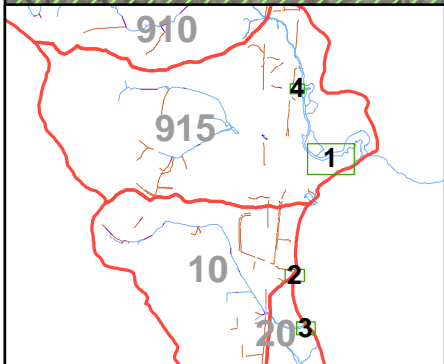
Total Cost: \$230,000

20-CZIP-04



Legend

-  Existing SAV Plantings
-  New SAV Plantings
-  Beach Nourishment
-  Stream Stabilization
-  New Wetland Plantings
-  Parcels
-  Wetlands
-  Stream
-  Stone Jetty
-  Soft Backwater Structure
-  Coastal Zone
-  Coastal Zone Characterization



0 5 10 20 30 40 Feet

1 inch equals 40 feet

**Marumsko Creek and
Farm Creek Watershed
Coastal Zone
Improvement Project**

7D-20-01CZ

Right streambank of Farm Creek.
Erosion shown is estimated to be +/- 4
feet high above the high tide line.
6/30/2009



7D-20-01CZ

Right streambank of Farm Creek.
Photo shows undermining of trees
that are falling into the estuary.
6/30/2009

