SECTION 2.5 FIELD METHODS

In January, 2003, CWP spent a week field verifying the assumptions of the vulnerability analysis by visiting targeted subwatersheds and conducting special studies. In particular, CWP utilized the time spent in the field to answer the following questions:

- Do subwatersheds with a current impervious cover between 10-12% belong in the Sensitive or Impacted subwatershed management classification?
- In Impacted Special Resource subwatersheds, are the wetlands capable of water quality treatment and providing valuable habitat?
- Do Rurally Impacted subwatersheds reflect their revised management classification (i.e., lack stream buffers, cattle access, row crops, etc)?
- Which of the sensitive subwatersheds deserve prioritization?
- Are there opportunities for streambank stabilization?

CWP employed three special studies to help answer these questions: the Rapid Bioassessment Protocol (RBP), contiguous forest assessment, and wetland evaluation. Descriptions of these field methods are provided below.

Rapid Bioassessment Protocol (RBP)

The purpose of the EPA's RBP Habitat Assessment is to provide a measure of the overall habitat condition of the study reaches based on assessments at discrete intervals. The RBP is a semi-quantitative method that asks an investigator to assign a score to various stream habitats or channel parameters by comparing what is seen at points along the stream to a series of descriptions. Examples of the parameters that are evaluated include bank stability, riparian buffer (stream buffer) width and disruption, sediment deposition and the quality of in-stream habitat features such as pools and riffles. After the parameters are assessed, a total score is determined. The RBP method determines the degree of impairment by comparing the total assessment scores found at study reaches to those found at the least impaired reference reaches to determine the overall condition and the degree of impairment. These reference streams represent a surrogate for the best attainable condition for the region. A sample field sheet is provided in Appendix C. The entire RBP method documentation can be viewed and downloaded from EPA's website at www.epa.gov/owow/monitoring/bioassess.htm

To evaluate the results of the sampling effort, scoring criteria were established. The scoring criteria are based upon the concept of a reference condition. The reference condition is considered to be the least impaired, best attainable condition for a stream in a given region. The highest rated sample stations in the study area were considered to be equivalent to reference conditions. The best two sample station scores in the study area were 180 and 184 for an average of 182. A score of at least 90% or greater of this number (>164) is considered comparable to the reference condition and represents excellent stream conditions. A score of 65% or less (<118) is considered non-supporting or poor stream conditions. Scores between these two extremes are considered good or fair. The final scoring criteria are shown in Table 8.

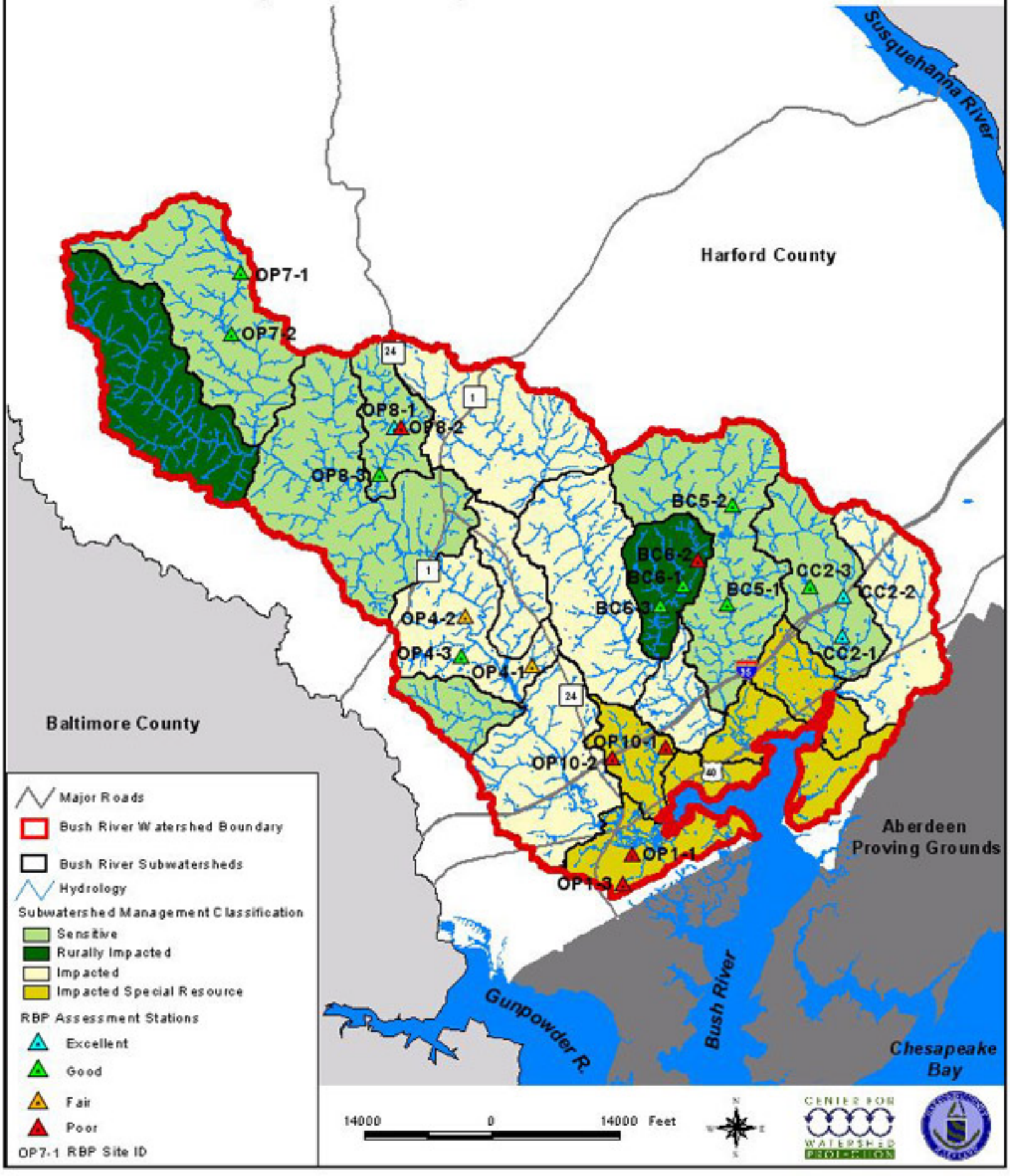
Table 8 Stream Assessment Scoring Criteria	
Habitat Category	**Habitat Score**
Excellent	>=164
Good	163-142
Fair	142-118
Poor	<118

A total of 20 RBP points were taken in the Bush River watershed. The distribution of these points are illustrated in Table 9 and Map 9. As mentioned previously, the RBP was mainly utilized to verify field assumptions and answer the questions presented above. Table 9 provides a summary of the RBP habitat conditions found at each site and presents a justification for why an RBP assessment was conducted within a given subwatershed. These results were used in the final determination of management classifications and recommendations (See Section 3.0).

Table 9. In-stream Habitat Conditions in Bush River Subwatersheds

Subwatershed Name	RBP ID	Total RBP Score	RBP Habitat Category	Field Notes	Purpose of RBP Assessment
James Run	BC5-1	156	Good	Streams with good habitat quality; large contiguous agricultural parcels	Assess for prioritization. Scoring indicates borderline status (see Section 2.7)
James Run	BC5-2	144	Good		
Little East Bynum	BC6-1	144	Good	Streams with generally good habitat quality; evidence of agricultural impacts	No existing monitoring data (Fish IBI, etc); wanted to verify Rurally Impacted classification
Little East Bynum	BC6-2	114	Poor		
Little East Bynum	BC6-3	152	Good		
Grays Run	CC2-1	180	Excellent	Highest rated streams in assessed subwatersheds	Assess for prioritization. Establish reference stream condition
Grays Run	CC2-2	184	Excellent		
Grays Run	CC2-3	150	Good		
Otter Point DD	OP1-1	59	Poor	Unstable channels associated with developed areas	Special Resource Impacted classification plus SCAM revealed several eroded streambanks; assess potential for streambank stabilization.
Otter Point DD	OP1-3	80	Poor		
Middle Winters	OP4-1	126	Fair	Somewhat degraded conditions	Current IC at 11.1 – should subwatershed be managed as Sensitive or Impacted
Middle Winters	OP4-1	141	Fair		
Middle Winters	OP4-3	160	Good		
East Branch	OP7-1	150	Good	Some obvious impacts of agriculture including lack of buffer and cattle access to streams	Assess for prioritization. Scoring indicates borderline status (see Section 2.7)
East Branch	OP7-2	145	Good		
Bear Cabin	OP8-1	169	Excellent	Mainstem had good to excellent habitat. One 1st order tributary was very degraded due to uncontrolled stormwater runoff	Current IC at 11.5 – should subwatershed be managed as Sensitive or Impacted
Bear Cabin	OP8-2	107	Poor		
Bear Cabin	OP8-3	156	Good		
Haha Branch	OP10-1	79	Poor	Unstable channels associated with developed areas	Special Resource Impacted classification plus SCAM revealed several eroded streambanks; assess potential for streambank stabilization.
Haha Branch	OP10-2	89	Poor		

Map 9- Bush River Rapid Bioassesssment Protocol Results



Contiguous Forest Tract Identification and Assessment

Contiguous forest is defined as a forest that is continuous and without significant breaks from roads, power lines or other clearings. The larger and more round a tract of contiguous forest, the greater the amount of interior forest is created. Contiguous forest is important for species diversity and the protection of forest interior dwelling species including breeding songbirds and small mammals. Identification of contiguous forest in the Bush River watershed involved two steps. In the first step, land cover digital orthophotographs provided by Harford County were analyzed to identify potential contiguous tracts of forest. In the second step, candidate sites were evaluated in the field by assessing forest community, structure and canopy. In this step, site visits were performed to evaluate the contiguous forest stands and determine if they were affected by roads, clearing or development. In the assessment, forest plots were selected and factors were measured including the dominant tree species using a wedge prism and canopy cover using a concave densiometer. Forest structure, understory conditions, invasive species and diseases were also noted.

Contiguous forest tracts were assessed in the Church Creek Direct Drainage (CC-1), Grays Run (CC-2) and Otter Point Creek Direct Drainage (OP-1) subwatersheds (see Map 10). Contiguous forest assessments were conducted in Grays Run for several reasons. In addition to preliminarily being identified as a priority Sensitive subwatershed (See Section 2.7), GIS data for Grays Run indicated significant tracts of contiguous forest. While GIS mapping did not show large expanses of forest in Church Creek Direct Drainage, field verification indicated otherwise (See Figure 10). A contiguous forest assessment was conducted in Otter Point Direct Drainage because of its Impacted Special Resource classification (see Section 2.4) and GIS mapping that indicated the presence of contiguous forest.

Figure 10. Contiguous Forest Tract in Church Creek DD

Field verification found that one of the largest tracts of contiguous forest in Grays Run had recently undergone selective timber harvesting and contained clearing that may be a precursor to development. Six contiguous forest tracts greater than 200 acres were identified in the first step, and two of these tracts were assessed during the fieldwork. A seventh tract (CA-OP-1) was identified in the field. Findings from the contiguous forest assessments are summarized in Table 10. The form and methodology used for the Contiguous Forest Assessment is located in Appendix C.

Table 10. Contiguous Forest Assessment

Subwatershed Name	Contiguous Forest ID	Condition
Church Creek DD	CA-CC2-1	Remains contiguous – some cattle grazing reduces the extent
Grays Run	CA-CC2-2	Selective timber harvesting
	CA-CC2-3	Selective timber harvesting
	CA-CC2-4	Mature forest along a tributary to Grays Run
	CA-CC2-5	Contiguous
Otter Point Creek DD	CA-OP1-1	Contiguous (mature tract associated with the Izaak Walton League property)

CA: conservation area

Wetland Identification and Evaluation

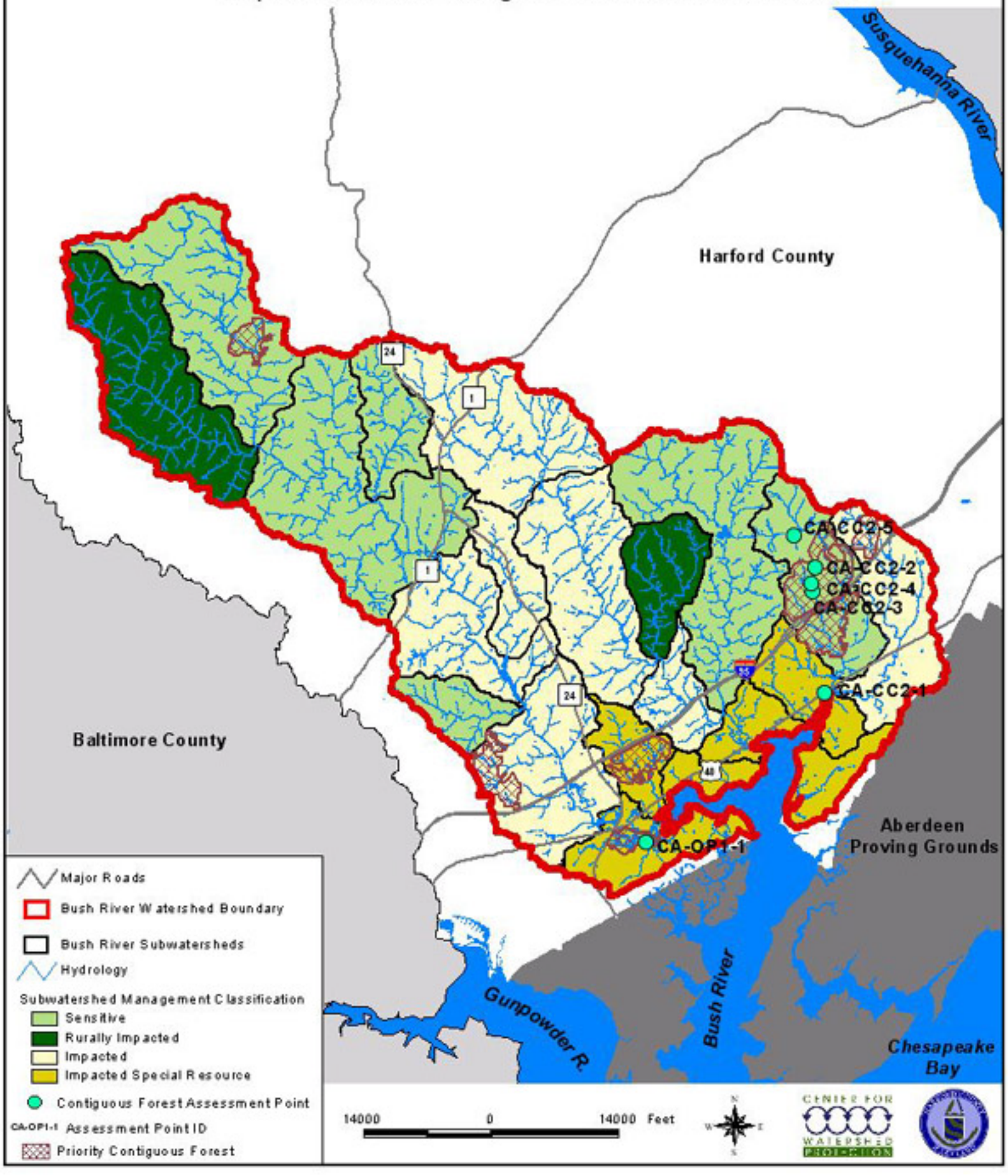
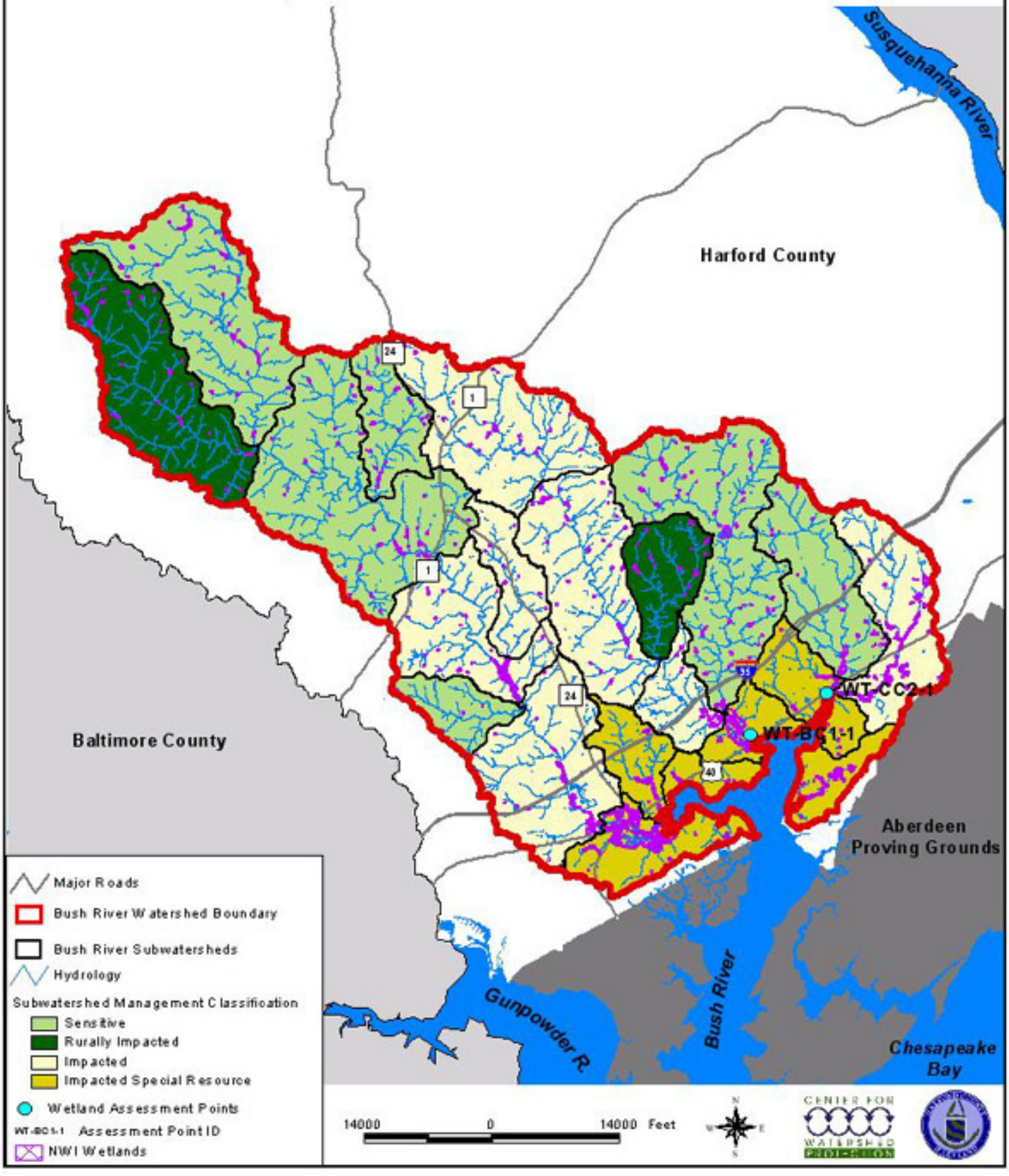
The goal of the wetland identification and evaluation assessment was to determine the significance of large wetland complexes, identified by reviewing the National Wetlands Inventory data layer, for both habitat and water quality. These wetland sites were then located in the field and assessed for wetland habitat and water quality function. The methodology and the scoring guidelines are located in Appendix C. The functional assessment for wildlife was focused on determining both habitat complexity and features that negatively affect habitat value. The functional assessment for water quality was based on vegetation, detention time, water contact and substrate-slope characteristics. The two wetland sites that were surveyed scored highly for water quality and habitat. Consequently, they were determined to provide diverse wildlife habitat and provide significant water quality treatment and protection.

The two wetland areas surveyed included are located in the Impacted Special Resource subwatersheds, Church Creek Direct Drainage (CC-1) and Bush Creek Direct Drainage (BC-1) (see Map 11). Both wetlands surveyed allow flood flows to have close contact with vegetation and provide large areas for flood flows to dissipate and be filtered by wetland vegetation.

Additional Field Verification

The utilization of the field findings are mostly discussed within Section 2.7, Subwatershed Prioritization and Section 3.0, Recommendations. However, it is appropriate to note here that because of RBP scores, the Bear Cabin subwatershed, with 11.5% impervious cover, was found to be in the Sensitive management classification, while Middle Winters Direct Drainage (11.1% IC) remains in the Impacted management classification. Map 8 (management revisions) reflects these changes.

Map 10 - Bush River Contiguous Forest Assessment Results



Map 11 - Bush River Wetlands Assessment Points