

**TABLE 4.13-11
MITIGATION REQUIREMENTS AND AVAILABLE MITIGATION ACRES BY WATERSHED**

Watershed	Mitigation Required (acres)			Potential Mitigation Available (acres)
	CBA 1	CBA 2	CBA 3	
Nansemond	90.12	59.50	28.36	196
Blackwater	144.51	136.58	212.39	301
Nottoway	20.30	0	0	2,432
Totals	254.10	196.04	240.75	2,929

Sufficient mitigation was identified in the Nansemond and Nottoway Rivers to compensate for proposed impacts. The search within the Blackwater River watershed was deficient by 32 to 60 acres depending on which CBA was selected. The Blackwater River watershed mitigation deficit can be resolved by providing the balance of mitigation in adjacent watersheds (especially the Nottoway River watershed which, like the Blackwater, is a tributary to the Chowan River).

With total mitigation requirements within the Design Corridor of 254.10 acres for CBA 1, 196.04 acres for CBA 2, and 240.75 acres for CBA 3, sufficient restoration and creation acreage to compensate for unavoidable wetland impacts has been identified within study area watersheds. In addition, the following options can also provide compensation: 1) VDOT mitigation bank credits, 2) commercial banks, and 3) contributions to the Virginia Wetland Restoration Trust Fund. Payment in-lieu to the Trust Fund would be made only after a determination had been made that it is not feasible to provide all necessary mitigation through restoration or creation. Should it be determined at a later phase of project design that wetland impacts will be greater than estimates given herein for Design Corridor CBA concepts, the wetlands mitigation site search conducted as part of this study verifies that adequate acreage of suitable mitigation sites exists within study area watersheds (see Table 4.13-11).

4.14 FLOODWAYS & 100 YEAR FLOODPLAINS

See Figure 4.14-1 for locations of floodways and 100-year floodplains. A more-detailed discussion of floodplains and associated floodways is presented in the *Natural Resources Technical Report* (VDOT, 2005).

4.14.1 Effects

Each CBA would span floodways and encroach upon 100-year floodplains at multiple locations. Four regulated floodways would be crossed under CBA 1, four under CBA 2, and three under CBA 3. Table 4.14-1 presents floodway crossings by CBA, stream, and watershed. Floodway crossings are depicted in Figure 4.14-1. Without construction of those bridges presented in Table 4.13-1, 72.55 acres of floodplain would be affected under CBA 1, 71.78 acres under CBA 2, and 99.53 acres under CBA 3 within the Design Corridor. With construction of those bridges presented in Table 4.13-1, 58.19 acres of floodplain would be affected under CBA 1 (a 20 percent reduction in floodplain encroachment), 63.42 acres under CBA 2 (a 12 percent reduction in floodplain encroachment), and 84.75 acres under CBA 3 (a 15 percent reduction in floodplain encroachment) within the Design Corridor. Table 4.14-1 presents floodplain encroachment estimates by CBA, stream, and watershed. Floodplain encroachments are depicted in Figure 4.14-1.

With CBAs being centered within the Planning Corridor, three near-parallel floodplain encroachments would result from development of CBA 1, five from CBA 2, and six from CBA 3. If, during later design

phases, it is feasible to shift centerlines away from floodplains, these near-parallel floodplain encroachments could be reduced to two for CBA 1, four for CBA 2, and four for CBA 3. Although estimates presented in Table 4.14-1 for the Design Corridor reflect preliminary efforts to avoid and minimize impacts, additional lateral encroachments where new roadway would span or extend perpendicular to an existing floodplain may become necessary; however, this possibility cannot be definitively assessed at the current level of conceptual design. Future design efforts will attempt to minimize impacts to all floodplains, particularly near-parallel encroachments which might otherwise require fill by placing the roadbed on structure (depending on the degree of lateral encroachment and associated costs of providing structure).

Although small amounts of new right-of-way may be required for implementation of programmed improvements associated with the No-Build Alternative, no major impacts to floodplains are anticipated; however, evaluation of the potential effects to floodplains may be required if any programmed improvement involves major new construction.

4.14.2 Mitigation

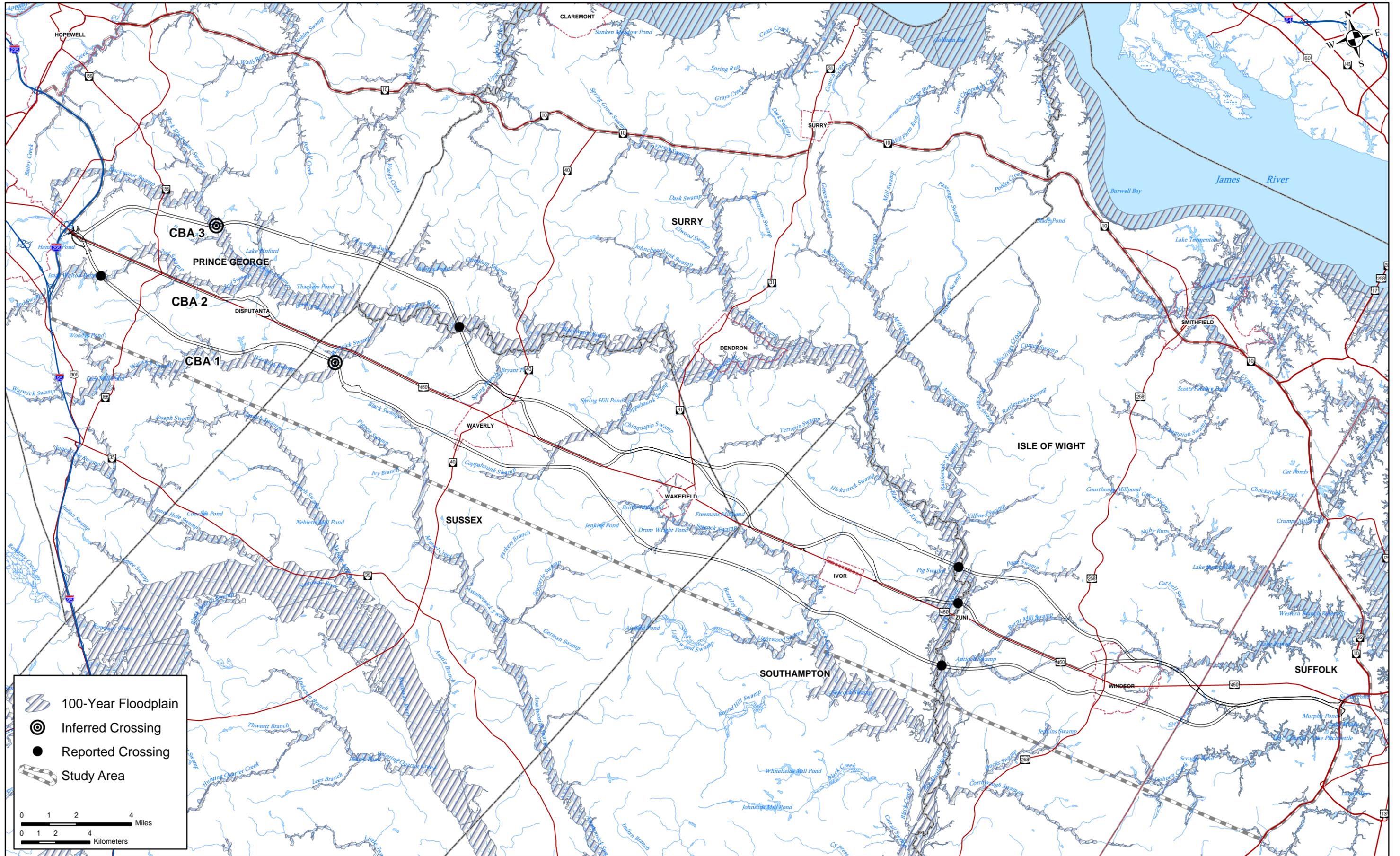
Based on preliminary engineering, 7 bridges would be constructed along CBA 1, 8 along CBA 2, and 7 along CBA 3 to minimize the amount of solid fill that would be placed within 100-year floodplains. Future design would focus on avoiding and minimizing floodplain encroachment to ensure that CBAs are consistent with Executive 11998 and FHWA policy as set forth in 23 CFR 650. The design would include detailed hydraulic evaluation to ensure that increases in flood risk and impacts to floodplain values would not result from construction. At proposed bridge crossings, the minimum number of piers to ensure structural stability will be placed within floodways. Feasible construction methods that would not require the placement of construction causeways would be evaluated during the design phase. Should it become necessary, fill placed for temporary construction causeways or work bridges would be removed and preconstruction floodplain conditions will be restored immediately following construction. Breastwalls and fill placed within floodplains for bridge abutments would be minimized.

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**TABLE 4.14-1
FLOODWAY CROSSINGS AND FLOODPLAIN ENCROACHMENTS**

Alternative	Waterway or Water Body	HUC	Planning Corridor		Design Corridor			
			Floodway Crossings (#)	Floodplain Encroachments (acres)	Floodway Crossings (#)	Floodplain Encroachments without Bridges (acres)	Floodplain Encroachments with Bridges (acres)	
CBA 1	Blackwater Swamp / Warwick Swamp	03010202	2	47.42	2	22.35	18.13	
	Middle Blackwater River	03010202	1	73.57	1	33.66	29.43	
	Seacock Swamp	03010202	1	19.39	1	8.10	6.41	
	Speights Run / Lake Cahoon / Lake Meade / Lake Kilby	02080208	0	12.21	0	5.73	3.62	
	Upper Blackwater River / Cypress Swamp	03010202	0	7.42	0	2.71	0.60	
	Western Branch Reservoir	02080208	0	0.58	0	0	0	
	Total			4	160.59	4	72.55	58.19
CBA 2	Blackwater Swamp / Warwick Swamp	03010202	3	79.17	3	20.72	18.14	
	Middle Blackwater River	03010202	1	70.58	1	30.07	27.49	
	Speights Run / Lake Cahoon / Lake Meade / Lake Kilby	02080208	0	11.17	0	5.21	3.92	
	Upper Blackwater River / Cypress Swamp	03010202	0	8.61	0	1.33	0.71	
	Western Branch Reservoir	02080208	0	33.22	0	14.45	13.16	
	Total			4	202.75	4	71.78	63.42
	CBA 3	Blackwater Swamp / Warwick Swamp	03010202	1	52.75	1	22.98	20.87
Middle Blackwater River		03010202	1	56.79	1	25.39	23.28	
Speights Run / Lake Cahoon / Lake Meade / Lake Kilby		02080208	0	11.17	0	5.21	3.10	
Upper Blackwater River / Cypress Swamp		03010202	1	70.07	1	32.30	28.07	
Western Branch Reservoir		02080208	0	33.35	0	13.65	9.43	
Total				3	224.13	3	99.53	84.75

Note: Calculations presented above do not include final efforts to avoid or minimize impacts because there are no preliminary engineered drawings of the proposed highway sections yet prepared. Engineering and design efforts to minimize or avoid impacts could result in reductions to encroachment acreages.



 100-Year Floodplain
 Inferred Crossing
 Reported Crossing
 Study Area

0 1 2 4 Miles
 0 1 2 4 Kilometers



FIGURE 4.14-1
 FLOODWAY CROSSINGS AND
 FLOODPLAIN ENCROACHMENTS

Within the Planning Corridor, two to three major near-parallel floodplain encroachments would result from development of CBA 1, four to five from CBA 2, and four to six from CBA 3. Encroachments of this type can be minimized or avoided during engineering and design of the roadway prism through use of steeper-than-convention road embankments, use of vertical retaining walls, further alignment adjustments, etc. All remaining encroachments are near-perpendicular and the floodplain would be spanned by bridging at these locations.

In addition to mitigation measures designed to reduce the amount of floodplain encroachment, sections 107 and 303 of VDOT's highway construction specifications require implementation of stormwater management practices to address concerns such as post-development runoff associated with storm events and downstream channel capacity. These standards require that stormwater management facilities be designed to reduce stormwater flows to pre-construction conditions for up to a 10-year storm event. VDOT and its construction contractors will adhere to the specifications to prevent an increase in flooding risks associated with proposed highway construction. For the majority of encroachments, it is anticipated that backwater elevations and waterbody flow velocity increases at the floodplain encroachments would be minimal or non-existent.

During final design, a detailed hydraulic survey and hydrology study would evaluate the effect of the proposed roadway improvements on stormwater discharge. The hydraulic study would ensure that no substantial increase in downstream flooding would occur. Design modifications to eliminate or minimize encroachments to the extent practicable are required by Executive Order 11988. For these reasons, it is likely that the CBAs would have negligible impacts to natural and beneficial floodplain values.

4.15 THREATENED OR ENDANGERED SPECIES

As discussed in section 3.15, three federal-listed threatened or endangered species and six state-listed threatened or endangered species have been reported within counties that lie partially within the study area. More-detailed discussion of threatened or endangered species is found in the Natural Resources Technical Report (VDOT, 2005).

4.15.1 Federally Protected Species Documented in Study Area

Locations of biodiversity ranked (BRANK) sites reported to contain federally listed threatened or endangered species somewhere within their boundaries are shown in Figure 4.15-1.

4.15.1.1 Bald Eagle (*Haliaeetus leucocephalus*)

Known bald eagle nesting sites are shown in Figure 4.15-1. None of the CBAs would directly affect any bald eagle nesting sites, nor would they encroach upon any Zone 2 protection zone extending 0.25-mile radius around a nest. At their western termini, each of the CBAs would include interchange improvements just outside Zone 2 of nesting sites within the Walton Habitat Zone; however considering the distance for known nesting sites and the presence of the existing I-295.U.S. 460 interchange, no adverse effects are anticipated. Although effects to the Walton Habitat Zone is unlikely considering these circumstances, ongoing coordination with FWS and VDGIF would be occur prior to construction of any CBA.

4.15.1.2 Red-Cockaded Woodpecker (*Picoides borealis*)

The red-cockaded woodpecker was classified as endangered because of its perceived rarity, declines in local populations. The protection of existing habitat and the provision of addition habitat suitable for the red-cockaded woodpecker is a prime management goal for protection of the species.

Within the study area, a population of red-cockaded woodpecker occurs several miles south of CBA 1 (distance given in general terms only to prevent disclosure of specific location) on a state-owned tract known as the Manry 604-606 Conservation Site. In January of 2005, field investigation was conducted