

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

along a recently shifted portion of CBA 1 roughly falling between the communities of Wakefield and Waverly. The alignment of CBA 1 within the aforementioned segment was shifted in late 2004 to avoid affects to a known historic architectural resource (the Parker House) and to avoid encroachment within the 0.5-mile radius of a historic sighting of the species within the Manry Wakefield Conservation Site. The January 2005 field investigation was conducted to determine whether suitable habitat for the red-cockaded woodpecker is present within or adjoining the 500-foot-wide assessment area of the proposed shifted alignment. Criteria used in determining the presence of suitable habitat are those set forth in the Recovery Plan for the Red-cockaded Woodpecker (*Picoides borealis*), Second Revision (U.S. Fish and Wildlife Service, 2003). Based on these criterion, no habitat suitable for the red-cockaded woodpecker was observed within the Planning Corridor of re-aligned CBA 1 or other areas in the vicinity of the assessment area. In summary, few pine trees of sufficient age and/or structure to serve as potential cavity trees are located within the CBA 1 Planning Corridor. Where potential cavity trees were observed, surrounding conditions (such as proximity to human-made disturbances, undesirable height of midstory, preponderance of hardwood species, absence of a sufficiently wide forested buffers, etc.) severely compromised or obviated the ability of the few mature pine trees to serve as potential cavity trees.

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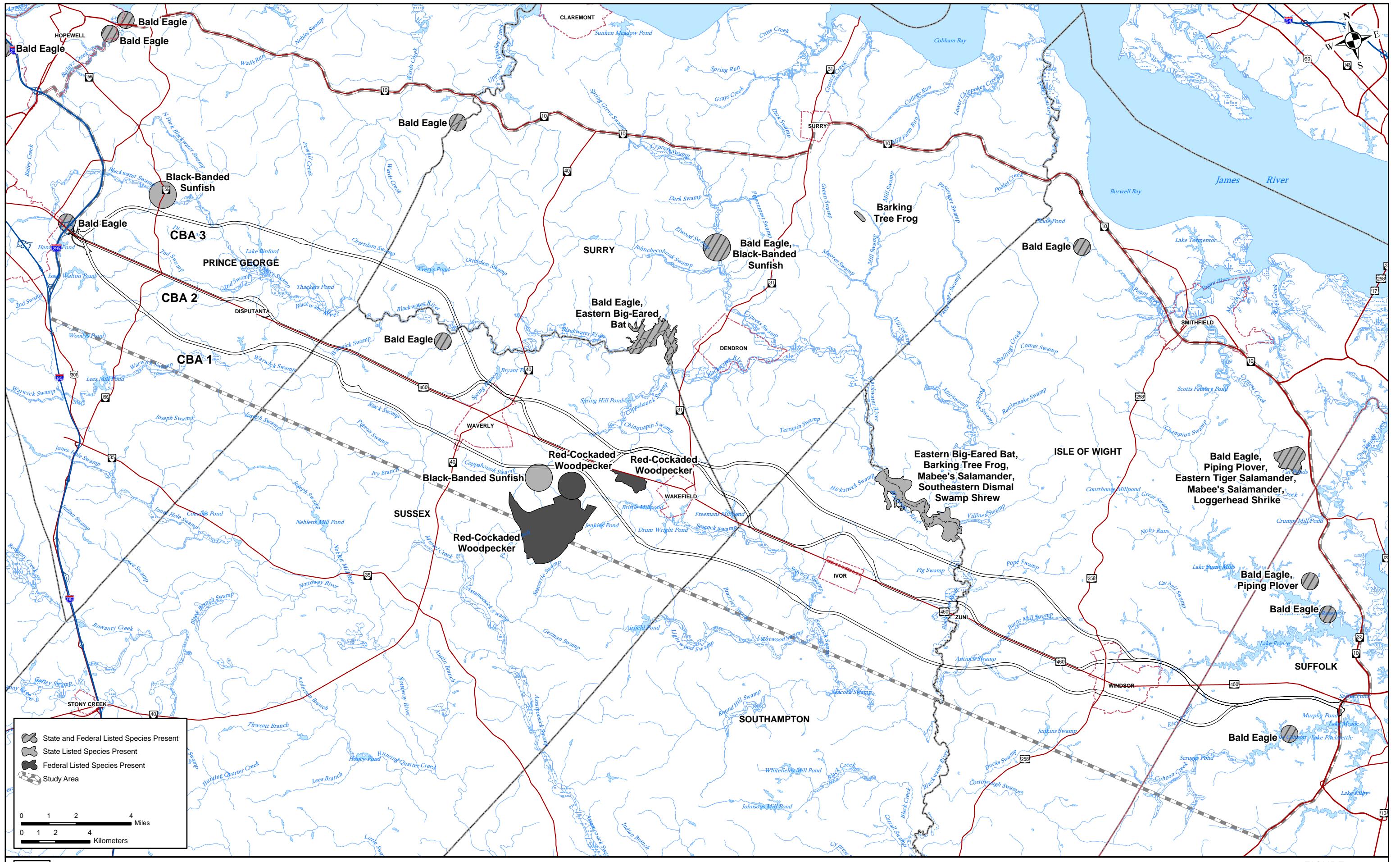


FIGURE 4.15-1
NATURAL HERITAGE SITES CONTAINING
FEDERAL AND STATE PROTECTED SPECIES

During field investigation, only one area in the vicinity of the shifted portion of CBA 1 was observed which could be considered to be *marginally* suitable habitat for the red-cockaded woodpecker; however, no birds or cavities were observed. Marginal suitability of the area in question is due to taller than desirable midstory, greater than desirable basal area, and scarcity of potential cavity trees. The area in question is approximately one mile east of the Manry 604-606 Conservation Site and 400 feet west of CBA 1. Effects to this species or its habitat is highly unlikely considering the large distance of any CBA from known populations and the lack of suitable habitat within areas affected by CBAs; however, further coordination with the U.S. Fish and Wildlife Service will occur prior to construction of any CBA.

4.15.1.3 Piping Plover (*Charadrius melanotos*)

Within the study area, sightings of this species have been reported around the shoreline of Lake Kilby and the Northwest Reservoir in the City of Suffolk and within the Cat Ponds conservation site just west of Route 10 in northeastern Isle of Wight County. At their nearest location, the CBAs would be located approximately four miles south of shorelines of Lake Kilby and the Northwest Reservoir where sightings have been reported. Effects to this species or its habitat is unlikely to non-existent considering the large distance of any CBA from reported sightings and the lack of suitable habitat within areas affected by CBAs.

4.15.2 Other Federally Protected Species Recommended for Possible Survey

4.15.2.1 Roanoke Logperch (*Percina rex*)

The nearest known population is reported in the Nottoway River in Dinwiddie County approximately 30 miles southwest of the Route 460 study area. Due to low stream gradients, a predominance of low energy stream environment, and the lack of self-scouring deeper pools, no suitable habitat for the Roanoke logperch appears to be present within the Route 460 study area. Effects to this species or its habitat is unlikely to non-existent considering the large distance of any CBA from known populations and the apparent lack of suitable habitat within areas affected by CBAs. Based on this finding, no additional survey is proposed.

4.15.2.2 Dwarf Wedgemussel (*Alasmidonta heterodon*)

The nearest known population of Roanoke logperch is reported in the Nottoway River in Sussex County approximately 16 miles south of the Route 460 study area. Due to low stream gradients, a predominance of low energy stream environment, and the lack of clean coarser-grained stream bottoms, no suitable habitat for the dwarf wedgemussel appears to be present within the Route 460 study area. Effects to this species or its habitat is unlikely to non-existent considering the large distance of any CBA from known populations and the apparent lack of suitable habitat within areas affected by CBAs. Based on this finding, no additional survey is proposed.

4.15.2.3 Michaux's Sumac (*Rhus michauxii*)

The nearest known population of Michaux's sumac is reported on the Fort Pickett Military Reservation approximately 40 miles southwest of the Route 460 study area. The only portion of the study area where controlled burns is reported to occur is the Zuni Pine Barrens and Antioch Swamp Natural Area Preserves and portions of the Manry 604-606 Conservation Site (known by some as the "Piney Grove" site). Michaux's sumac does not occur within either of these areas. Other than upland portions of utility line clearings, where the species has not been reported, no other habitat suitable for Michaux's sumac has been observed within the Route 460 study area. Effects to this species or its habitat is unlikely to non-existent considering the large distance of any CBA from known populations. Based on this finding, no additional survey is proposed.

4.15.2.4 American Chaffseed (*Schwalbea americana*)

Much of this species' former habitat has long-since been converted to farmland. Housing development, road building, over-collection, and succession of its open habitat to woody vegetation (due to fire suppression) are documented threats. American chaffseed was last observed near the Sussex/Greenville county line (approximately 33 miles south of the Route 460 study area) in 1938, and the species is now thought to be extirpated in Virginia. Effects to this species or its habitat is non-existent considering the aged nature of the last sighting and the large distance of any CBA from the point of that sighting. Based on this finding, no additional survey is proposed.

4.15.3 State Protected Species Documented in Study Area

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

4.15.3.1 Eastern Big-Eared Bat (*Plecotus rafinesquii*)

Plecotus rafinesquii is rare in Virginia and is particularly susceptible to human disturbance. Within the study area, the eastern big-eared bat is documented to occur in or near the Hickaneck Swamp conservation site northeast of Ivor in Isle of Wight County and in or near the Dendron Swamp conservation site just west of the community of Dendron (DCR-DNH, 2003). None of the CBAs would encroach upon either of these two conservation sites as delineated by DCR-DNH. CBA 3, the nearest CBA, would be located approximately 1.25 miles to the south of the Hickaneck Swamp conservation site. At their nearest location, CBA 2 and CBA 3 would be located approximately four miles south of the Dendron Swamp conservation site, while CBA 1 would be located approximately 4.5 miles to the south. Although effects to this species or its habitat is unlikely considering these distances, continued coordination with the Virginia Department of Game and Inland Fisheries will occur prior to construction of any CBA.

4.15.3.2 Loggerhead Shrike (*Lanius ludovicianus*)

This species is a year-round resident in most of its habitat. The loggerhead shrike is a widespread but rare bird in Virginia. The exact causes of the significant decline in population for this species are unclear, but the decline may be due to several factors such as: habitat loss - clearing hedgerows and reforestation; excessive winter mortality - predation by raptors in woodlots during severe cold or snow cover; pesticide contamination; and/or collisions with motor vehicles.

At least one general occurrence and one resident occurrence of the loggerhead shrike has been reported in each of the localities comprising the study area. In addition, suitable habitat is observed within the study area. CBA 2 and CBA 3 would result in comparable direct losses of agricultural lands and transitional lands, some of which could serve as suitable habitat for the loggerhead shrike (1,237 acres and 1,229 acres, respectively). By contrast, CBA 1 would result in the direct loss of 965 acres of agricultural lands and transitional lands, some of which could serve as suitable habitat for the loggerhead shrike. With respect to severity of effects, none of the CBAs would result in significant direct effects to suitable habitat on a regional basis (ranging between 0.67 percent and 0.86 percent of total agricultural lands and transitional lands within the study area). Means to restrict or limit landscaping activities having the potential of attracting the loggerhead shrike to the highway corridor (thereby resulting in a higher probability of mortality due to wildlife/vehicle collisions) would be developed during late phases of project design and permitting. This could include methods to discourage the species from frequenting the highway corridor, such as (1) minimizing mowing operations in critical areas and (2) planting of wildflowers and shrubs rather than grasses within the right-of-way. To avoid or minimize adverse effects to nearby habitat, stormwater management facilities would be designed to detain and/or treat pesticides and herbicides applied within the right-of-way. Although effects to this species or its habitat are not considered to be severe, continued coordination with the Virginia Department of Game and Inland Fisheries will occur prior to construction of any CBA.

4.15.3.3 Barking Tree Frog (*Hyla gratiosa*)

This species is threatened because of limited distribution and attractiveness in the pet trade. Within the study area, the barking tree frog is documented to occur in the Hickaneck Swamp conservation site northeast of Ivor in Isle of Wight County and in the Beachland Habitat Zone conservation site located south-southeast of Surry in Surry County (DCR-DNH, 2003). None of the CBAs would encroach upon either of these two conservation sites as delineated by DCR-DNH. CBA 3, the nearest CBA, would be located approximately 1.25 miles to the south of the Hickaneck Swamp conservation site and approximately ten miles south of the Beachland Habitat Zone conservation site. Although effects to this species or its habitat is unlikely considering these distances, continued coordination with the Virginia Department of Game and Inland Fisheries will occur prior to construction of any CBA.

4.15.3.4 Mabee's Salamander (*Ambystoma mabeei*)

Known populations are low in number and are highly threatened (primarily by urbanization). Breeding sites in Virginia are fish-free vernal ponds. In Southampton County, the breeding pond is within a large clearcut. In Isle of Wight County, the breeding sites are ephemeral Coastal Plain sinkhole ponds up to 1.5 meters deep with surrounding forests generally composed of hardwoods mixed with pine. Within the study area, Mabee's salamander is documented to occur in the Cat Ponds conservation site just west of Route 10 in northeastern Isle of Wight County and in the Hickaneck Swamp conservation site northeast of Ivor in Isle of Wight County (DCR-DNH, 2003). None of the CBAs would encroach upon either of these two conservation sites as delineated by DCR-DNH. At their nearest location, the CBAs would be located approximately eight miles south of the Cats Pond conservation site. CBA 3, the nearest CBA, would be located approximately 1.25 miles to the south of the Hickaneck Swamp conservation site. Although effects to this species or its habitat is unlikely considering these distances, continued coordination with the Virginia Department of Game and Inland Fisheries will occur prior to construction of any CBA.

4.15.3.5 Eastern Tiger Salamander (*Ambystoma tigrinum*)

Industrial pollution and intensive agriculture have an adverse affect on this species. Within the Route 460 study area, the eastern tiger salamander is documented to occur in the Cat Ponds conservation site just west of Route 10 in northeastern Isle of Wight County (DCR-DNH, 2003). None of the CBAs would encroach upon the conservation site as delineated by DCR-DNH. At their nearest location, the CBAs would be located approximately eight miles south of the Cats Pond conservation site. Effects to this species or its habitat is highly unlikely considering this distance.

4.15.3.6 Blackbanded Sunfish (*Enneacanthus chaetodon*)

Within the study area, blackbanded sunfish is documented to occur (1) in Cypress Swamp just north of Dendron, (2) in the Blackwater Swamp near Prince George Courthouse, and (3) in Harrells Millpond and the headwaters of Coppahaunk Swamp just south of Route 460 between Wakefield and Waverly (DCR-DNH, 2003).

At their nearest location, CBA 1 and CBA 2 would be located approximately seven miles south (downstream) of the Cypress Swamp population, while CBA 1 would be located approximately 10.5 miles south (downstream). Effects to the Cypress Swamp population or its habitat is non-existent considering the large downstream distance of the CBAs.

The nearest CBA with respect to the Prince George Courthouse occurrence (CBA 3) would be located 0.25 mile south of the DNH-delineated conservation site radius and would cross a unnamed tributary of the Blackwater River approximately one mile upstream of the Blackwater River. Although no direct effects to the current population is anticipated stormwater management facilities would be designed to reduce stormwater pollutant loading.

CBA 1 would encroach upon the 0.5-mile-radius of the unnamed conservation site within which Harrells Millpond and the headwaters of Coppahaunk Swamp are located. Should CBA 1 be constructed, aquatic

habitat critical to the population would be avoided through spanning-on-structure. Should spanning-on-structure prove to be infeasible, measures to minimize unavoidable effects will be developed in coordination with the Virginia Department of Game and Inland Fisheries prior to construction. In addition, stormwater management facilities would be designed to reduce stormwater pollutant loading.

4.15.3.7 Southeastern Dismal Swamp Shrew

Although taken off the federal list in 2000 because of findings of occurrence more widespread than previously thought, the southeastern Dismal Swamp shrew remains listed as threatened by Virginia (which contends that the species remains threatened due to habitat drainage, development, and natural catastrophe). Within the study area, the southeastern Dismal Swamp shrew is documented to occur in the Hickaneck Swamp conservation site located northeast of Ivor in Isle of Wight County (DCR-DNH, 2003). None of the CBAs would encroach upon the conservation site as delineated by DCR-DNH. CBA 3, the nearest CBA, would be located approximately 1.25 miles to the south of the Hickaneck Swamp conservation site. Although effects to this species or its habitat is unlikely considering this distance, consultation with the Virginia Department of Game and Inland Fisheries will be initiated prior to construction of any CBA.

4.16 WILD AND SCENIC RIVERS

4.16.1 Federal Wild and Scenic Rivers

According to the *2002 Virginia Outdoors Plan* (Virginia Department of Conservation and Recreation, 2002) and the Philadelphia Support Office of the National Park Service (U.S. Department of the Interior, 2004), no Federal wild and scenic rivers are located in or immediately downstream of the study area.

4.16.2 State Scenic Rivers

According to the *2002 Virginia Outdoors Plan* (Virginia Department of Conservation and Recreation, 2002), no legislatively designated state scenic rivers are presently located in or immediately downstream of the study area. The Blackwater River is, however, identified in the 2002 Plan as a potential future component of the Virginia Scenic Rivers program. All three CBAs would cross the Blackwater River within that segment determined to be a potential component of the Virginia Scenic Rivers program.

With implementation of appropriate mitigation measures (as discussed in associated portions of this EIS), those attributes of the Blackwater River which currently merit its consideration for possible future state inclusion (i.e., recreational boating opportunities, natural heritage resources, scenic qualities, and warmwater fisheries) would not be substantially affected by construction of a CBA. If any river segment within the corridor is designated as a component of the Virginia Scenic Rivers Program prior to construction or within the foreseeable future of construction, permanent impediments to natural flows would be prohibited (unless authorized by the General Assembly) and all use and development of water and water-related resources would be evaluated to ensure that they do not significantly alter or destroy the scenic or ecological character of the designated segment.

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 potentially eligible segments of the Blackwater River are anticipated; however, evaluation of the potential effects to the aforementioned resource attributes may be required if any programmed improvement involves major new construction.

4.17 MINERAL RESOURCES AND UNIQUE GEOLOGIC FEATURES

The only economic mineral resource occurring within the study area is sand and gravel which is primarily used largely as aggregate for regional construction. Exploitable sand and gravel deposits occurring on the surface are typically associated with (1) relict shorelines such as the Suffolk scarp and the Surry scarp (the Shirley Formation (Qsh) and the Moorings unit (Tm) of the Geologic Map of Virginia) and relict fluvial/deltaic terrace deposits restricted largely to the western portion of the study area (the Bacons Castle Formation (Tb¹) of the Geologic Map of Virginia). Exploitable sand and gravel deposits occurring beneath the surface are typically encountered at or near the base of fining-upward estuarine and marine deposits (generally tens of feet beneath the surface) which underlie large expanses of the central and eastern portions of the study area. Because of the relatively widespread occurrence of identified mineral resources (sands and gravels), the regional distribution of geomorphic features (as determined from published geologic maps) was considered pursuant to assessing the magnitude and severity of effects.

Because of their relative abundance within the study area (both on the surface and in the subsurface), sand and gravel deposits are not considered to be a unique or limited resource. Should a CBA be constructed, a maximum of 1,842 acres of land would be unavailable to sand and gravel exploitation (assuming implementation of CBA 3 within the Design Corridor). These 1,842 acres comprise only 0.39 percent of the total land surface within the study area (much of which contains surficial or subsurface sand and gravel deposits) and, as such, their conversion to transportation corridor would not adversely affect the potential for future economic exploitation of these mineral resources. Provision of a new regional transportation facility could serve to establish new markets or enhance existing markets for local sand and gravel reserves.

Active surface mining operations and other sites of economic mineral resources are shown on Figure 4.17-1. Sand and gravel operations are in a constant state of flux regarding closure of active operations and opening of new operations, thus any locations shown may change over time. During later phases of project design, access would be designed and traffic maintenance plans developed to avoid or minimize adverse effects to active mining/borrow operations.

No unique geologic features (such as fault lines, type locality stratigraphic sections, etc.) would be affected and any of the CBAs or programmed improvements included as part of the No-Build Alternative.

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