United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

September 14, 2006

Mr. Kenneth R. Myers
Federal Highway Administration
P.O. Box 10249
Richmond, Virginia 23240-0249

Colonel Dionysios Anninos
District Engineer
Norfolk District, Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510-1096

Mr. Gary Heyer
Fifth District, U.S. Coast Guard
Federal Building, 431 Crawford Street
Portsmouth, Virginia 23704

Attn: John Simkins, FHWA
Alice Allen-Grimes, Corps

Re: Route 624 Bridge Replacement,
Richmond County, Virginia
VDOT Project #: 0624-079-148
Corps Permit #: 05-4185

Dear Mr. Myers, Colonel Anninos, and Mr. Heyer:

The U.S. Fish and Wildlife Service (Service) has reviewed the Federal Highway Administration's (FHWA) biological assessment for the proposed Route 624 bridge replacement over Cat Point Creek in Richmond County, Virginia. This document represents the Service's biological opinion on the effects of that action on the bald eagle (*Haliaeetus leucocephalus*), federally listed threatened. This biological opinion is submitted in accordance with Section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.), the Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 U.S.C. 668-668d), and the Migratory Bird Treaty Act (MBTA) of 1918 (40 Stat. 775, 16 U.S.C. 703-712).

This biological opinion is based on information provided in the project permit application, 2006 biological assessment, meetings, electronic mail, telephone conversations, field investigations, and other sources of information. A complete administrative record of this consultation is on file in this office.

Consultation History

The consultation history of this permit application is provided in the Appendix.

BIOLOGICAL OPINION

I. DESCRIPTION OF PROPOSED ACTION

The existing two-lane bridge over Cat Point Creek on Route 624 (Newland Road) in Richmond County, Virginia was built in 1935. The bridge includes a swing span with a wooden deck, the remaining superstructure with a concrete deck, and all supported by steel beams. The original swing span was approved for closure on April 30, 1954 by the U.S. Army Corps of Engineers (Corps) and the span has been welded shut for many years. The bridge does not meet current geometric standards and is severely deteriorated. The swing span portion has a wooden deck that requires frequent maintenance. The steel beams have rusted completely through in some places and the eastern ends of the beams are under water at high tide. The footings of Pier 5 are undermined, exposing four timber piles. The sufficiency rating for the bridge is 6 on a scale of 1 to 100. The bridge is currently posted for a 15-ton load limit, although that limit is expected to be lowered in the near future. Vertical clearance above mean high tide for the existing bridge is approximately 4 feet (1.2 m) at midspan. The existing (2004) traffic volume on Route 624 is approximately 2,200 vehicles per day (Watts and Parsons Transportation Group Inc. of Virginia 2006).

The proposed replacement bridge would be built to current geometric design and load standards and would have two, 12-foot lanes with 8-foot-wide shoulders. The new bridge would be built adjacent to the north side of the existing bridge (upstream), because this was determined to have the least wetland impacts. The proposed bridge would be approximately 814 feet (250 m) long, consisting of ten 81'-6" prestressed concrete 45"-deep bulb-t spans continuous for live load. The proposed bridge is jointless, utilizing semi-integral abutments at the ends and 24" pile bents at the interior supports. The proposed profile results in approximately 7 feet (2.1 m) of clearance above mean high tide on the west side of the channel and approximately ten feet (3 m) of clearance on the east side of the channel. The elevation of the bottom of the girder at the abutment side was set at the design (100-year) flood elevation keeping the bridge superstructure out of the design floodplain and providing sufficient clearance for inspecting the bridge seats at the abutment. The proposed grade reduces the amount of fill, reduces the height/length of the retaining wall, and minimizes the effects to the property at the end of the bridge. Approximately 0.28 miles (.45 km) of roadway approaches would also be constructed. In addition, a new private boat ramp would be constructed to replace the existing privately-owned ramp and dock on the property at the west end of the bridge on the north side of the road that would be displaced by the new bridge. The forecasted traffic volume for 2017 is approximately 2,660 vehicles per day (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Replacement of the Route 624 bridge would be accomplished in phases and would require

several months to complete. Table 1 outlines the time frames associated with construction elements (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Table 1: Construction Phasing and Timeframes.

CONSTRUCTION ACCESS	
Clear and grub on new alignment to abutment A	3 weeks
Install fill to abutment A for equipment access	6 weeks
Install temporary work bridge	3 weeks
Approximate time frame to establish access to abutments/bents	**3 months**
SUBSTRUCTURE	
Drive sheetpiling at abutments A & B	2 @ 4 days
Trench widen existing pavement at abutment B	3 days
Excavate at abutment A & B	2 @ 2 days
Drive test piles for abutments and for bents	2 @ 3 days
Drive piles for abutment A and abutment B - 26 piles each	2 @ 6 days
Drive piles for each bent - 9 bents, 7 piles each	9 @ 2 days
Form and install reinforcing steel in pile caps for each bent	9 @ 3 days
Place concrete in each pile cap for each bent	9 @ 3 days
Form and install reinforcing steel in footing for each abutment	2 @ 3 days
Place concrete in each footing for each abutment	2 @ 3 days
Form and install reinforcing steel in backwalls for each abutment	2 @ 3 days
Place concrete in backwalls for each abutment	2 @ 4 days
Set girders	10 @ 5 days
Approximate time frame to perform Substructure work	**8 months**
ROAD WORK	
Construct approaches to abutments	5 days
Build pavement structure in new alignment	5 days
Tie in existing pavement	1 day
Clean ditches	3 days
Install guardrail and signs	2 days
Shift traffic to 1 lane on old and 1 lane on new alignment	1 day
Pull street piling	4 days
Construction remaining fill slope at abutments A & B	4 days
Switch all traffic to new alignment	1 day
Approximate time frame to perform road work	**3 weeks**
DEMOLITION AND CLEAN UP	
Remove old structure	6 weeks
Remove old pavement	2 weeks
Construct mitigation site including plantings	1 week
Approximate time frame to perform demolition and clean	**2 months**

The "action area" is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The Service has determined that the

action area for this project is the mouth of Cat Point Creek to the mouth of Scale's Millstream (approximately 5.6 kilometers (km) upstream of the Route 624 bridge), a total length of approximately 15 river km (Figure 1). It includes the entire width of Cat Point Creek up to 200 meters (m) from any shoreline at mean low tide. In those locations where Cat Point Creek is bifurcated surrounding an island, the shoreline includes the ordinary low tide line of both channels.

II. STATUS OF THE SPECIES RANGEWIDE

Species Description – The bald eagle is a large bird of prey with a wingspan of 6½ feet (2 m). It is found primarily near the coasts, rivers, and lakes of North America. The Chesapeake Bay bald eagle population was listed as endangered in 1978. The Chesapeake Bay recovery region encompasses Virginia, Delaware, Maryland, the eastern half of Pennsylvania, the panhandle of West Virginia, and the southern two-thirds of New Jersey. The Chesapeake Bay Recovery Team prepared a Recovery Plan that is pertinent to this biological opinion (USFWS 1990).

On August 11, 1995, the bald eagle population in the Chesapeake Bay was reclassified from endangered to threatened due to increasing numbers and range expansion (50 CFR Part 17 36000-36010). In the Chesapeake Bay Recovery Region, delisting requires (1) a nesting population of 300 to 400 pairs with an average productivity of 1.1 eaglets per active nest, sustained over five years, and (2) permanent protection of sufficient nesting habitat to support 300 to 400 bald eagle pairs. Additionally, enough roosting habitat to accommodate population levels commensurate with increases throughout the Atlantic region resulting from increased productivity is required (USFWS 1990). Since 1992, the criteria of the number of breeding pairs and productivity per nest (300, 1.1, respectively) have been met (Watts 2006a). However, there has been little permanent protection of nesting habitat within the Chesapeake Bay region. Over 75% of the bald eagle nests in Virginia and Maryland are located on private and corporate lands (Federal Register, Volume 71, No. 32; Thursday, February 16, 2006).

The Service announced a nationwide "Intent to Delist" proposal in July 1999, followed by a notice for public comment in the Federal Register (Proposed Rule, Volume 64, No. 128; Tuesday, July 6, 1999). On February 16, 2006, the Service reopened the public comment period on bald eagle delisting in the Federal Register (Proposed Rule, Volume 71, No. 32; Thursday, February 16, 2006). The public comment period ended on June 17, 2006. No further action has been taken and the species is still listed as threatened as of the date of this Biological Opinion.

Life History/Population Dynamics – Unless otherwise noted, the information in this section was taken from the Virginia Department of Game and Inland Fisheries (VDGIF) (1994) and Watts *et al*. (1994).

Bald eagles breed at four to five years of age, the same time they develop their white head and tail. Adult birds generally mate for life, establishing nesting territories that they return to each year. Nesting pairs may remain near their territory year-round, particularly toward the southern

range of the species. In addition to the resident breeding population, Virginia has three bald eagle "concentration areas" where sub-adults and non-breeding adults congregate. These areas are used for foraging, perching, and roosting during one or more seasons of the year.

During the day, eagles spend approximately 94% of their time perching (Gerrard *et al*. 1980, Watson *et al*. 1991). During the breeding season, 54% of that time is spent loafing, 23% scanning for food or eating, and 16% nesting (Watson *et al*. 1991). Eagles prefer high perches in trees that rise above the surrounding vegetation to provide a wide view that faces into the wind (Gerrard *et al*. 1980). In Maryland, eagles used shoreline that had more suitable perch trees, more forest cover, and fewer buildings than unused areas at all times of the year. Distance from the water to the nearest suitable perch tree was shorter for areas used by bald eagles than areas that did not receive eagle use (Chandler *et al*. 1995). In Chandler *et al.'s* study, eagles tended to perch within 50 m of the shore. They recommended that shoreline trees greater than 20.1 cm in diameter at breast height and dead trees not be removed. Eagles often locate prey from a shoreline perch, and hunting forays from perches appear to be more successful than those initiated from flight (Jaffee 1980). Gerrard *et al*. (1980) found that after a successful fishing trip, eagles flew to a low perch to feed; these perches were less than 10 m above the water and were well below the level of neighboring treetops. Clark (1992) observed that, within the Powell Creek Concentration Area on the James River, eagles perched in shoreline trees flew out to pick up fish and then returned to the perch to eat.

Bald eagles are opportunistic foragers, preying on fish, birds, small mammals, and carrion. In the summer, fish are the primary component of the diet. Eagles in Virginia feed on such species as shad, catfish, carp, menhaden, perch, and eels depending on their seasonal availability. In the fall and winter, eagles shift their foraging to waterfowl, other birds, etc., and supplement their diet to a greater extent with carrion. Because the main diet of bald eagles inhabiting the Chesapeake Bay and its tributaries during the summer is fish, the majority of birds are likely to be present along the shoreline at any given time (Wallin and Byrd 1984). Foraging is a key behavior that influences daily and seasonal activity budgets (Watson *et al*. 1991). Foraging patterns may be strongly influenced by tidal fluctuations. Several studies have found that eagles foraged much more than expected during low tides and less than expected at high tides (McGarigal *et al*. 1991, Watson *et al*. 1991). In King George County, Virginia, overall bald eagle foraging frequency was highest from 4:35 to 6:00 a.m., with a small decline from 6:00 to 10:00 a.m. At 10:00 a.m. foraging decreased further and then remained the same until 6:00 p.m. when it decreased rapidly (Jaffee 1980).

During the late afternoon/early evening, bald eagles fly inland to roost for the night. Most summer eagle roosts in the Chesapeake Bay region were found in greater than 40.5-hectare (ha) forest blocks and were further from human development than random sites (Buehler *et al*. 1991b). Ninety-five percent of the roosts were within 720 m of water and 50% were at least 680 m from the nearest building (Buehler *et al*. 1991b). Trees used for roosting were larger in diameter, taller, and more accessible from the air than other available trees (Keister and Anthony 1983, Buehler *et al*. 1991b). Another important attribute of communal roosts is proximity to food sources (Keister and Anthony 1983). Because much of the eagle forage base occurs in the

water, suitable habitat along rivers is important. Clark (1992) found that within the Powell Creek Concentration Area, distance to the roost was the most important habitat factor that influenced eagle distribution along the shoreline. Buehler *et al*. (1991b) determined that on the Northern Chesapeake Bay ". . . fewer than 2% of the random trees met the minimum habitat values of roost trees, indicating that suitable roost trees are scarce relative to other trees. This relative scarcity suggests that if shoreline forest is removed indiscriminately, roost habitat could become limiting to the bald eagle population in the future."

Status and Distribution – Historically, bald eagles were plentiful along major river systems and coastal areas in the United States and Canada. However, habitat loss associated with human settlement, and later, the use of persistent pesticides (such as DDT) for crop management, resulted in a dramatic decline in eagle populations. By the late 1960s, most breeding populations had been decimated by eggshell thinning and associated low productivity. Since the nationwide ban on most persistent pesticides, bald eagle populations have experienced gradual recovery in both productivity and total numbers.

In Virginia, the bald eagle breeding population has steadily increased from an estimated low of approximately 32 pairs in the late 1960s to 453 known occupied territories in 2005 (Watts 2005). Of this 2005 total, 175 (or approximately 39%) were surveyed on the Rappahannock River (Watts and Parsons Transportation Group Inc. of Virginia 2006). During the 2005 surveys, there were seven active bald eagle nests in the Cat Point Creek drainage (Watts 2005).

During summer, the Chesapeake Bay supports migrant bald eagles from breeding populations in Florida and elsewhere in the southeast. While in the Bay, migrant eagles congregate in six to eight concentration areas where they forage and utilize communal roosts. Peak counts of birds using the upper James River Concentration Area increased by a factor of five between 1982 and 1991 (Watts and Byrd 1999). This level of increase is generally consistent with the growth in the populations believed to utilize the Bay during summer. Collectively, summer concentration areas within the Chesapeake Bay support a minimum of 1,500 birds. This composite number is based on peak bald eagle estimates within concentration areas during the mid-1990s from shoreline surveys. Peak counts include: James River (450), upper Rappahannock River (320), Upper Potomac River (500+), Pocomoke River (30), Nanticoke River (150), and the upper Chesapeake Bay including Aberdeen Proving Ground (100). How many total birds may pass through these areas during the summer months or what proportion of birds are from distant populations is unknown (Watts and Parsons Transportation Group Inc. of Virginia 2006).

The section of the Rappahannock River between Tappahannock and Port Royal supports one of the largest summer bald eagle concentration areas known in eastern North America (Watts 1998a). Portlock (1994) began documenting elevated numbers of bald eagles along the Rappahannock shoreline between Tappahannock and Port Royal in the mid-1980s. Surveys during the summer months between 1987 and 1994 showed a range of 30 to 77 birds. In 1993, high-use shoreline areas were used to delineate the Rappahannock River Bald Eagle Concentration Area between Paynes Island and Port Royal (Watts *et al*. 1994). In 1998, Watts conducted a series of six shoreline surveys between June 17 and September 14 and documented a

peak count of 232 bald eagles between Tappahannock and Mount Swamp above Port Royal. Shoreline use patterns were used to re-delineate the Rappahannock River Bald Eagle Concentration Area, which is currently defined as the area between Tappahannock and Mount Swamp (Watts and Parsons Transportation Group Inc. of Virginia 2006).

In winter, the Rappahannock River supports the most significant winter bald eagle concentration area in Virginia. Elevated numbers along the shoreline between Tappahannock and Port Royal have been known since the early 1980s when consistent aerial surveys were conducted during the mid-winter period (Byrd unpublished data). From surveys conducted in the month of January between 1987 and 1994, Portlock (1994) documented peak numbers on the river. During these
surveys in 1992, 1993, and 1994, he documented 96, 104, and 98 birds respectively. Portlock (1994) identified the Fones Cliffs-Paynes Island and Horsehead Point-Nanzatico Bay as particularly significant concentration areas. VDGIF and Portlock have coordinated mid-winter surveys along the river between Tappahannock and Mount Swamp since 1997. The average (mean + standard error) count total for this time period (1997-2005) was 177.1 + 29.93 with a high count of 383 on February 7, 2005 (Table 2) (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Table 2: Results for mid-winter bald eagle surveys within the Rappahannock River Bald Eagle Concentration Area (between Tappahannock and Mount Swamp). Parenthetic values indicate number along the Cat Point Creek (CPC) shoreline.

Survey Date	Adult (CPC)	Juvenile (CPC)	Unknown (CPC)	Total (CPC)
1/24/97	88 (10)	80 (9)	2 (0)	170 (19)
1/16/98	32 (3)	40 (5)	1 (0)	73 (8)
1/12/99	65 (5)	96 (21)	1 (0)	162 (26)
1/7/00	57 (12)	90 (16)	5 (1)	152 (29)
1/12/01	129 (23)	147 (18)	0 (0)	276 (41)
1/8/02	118 (41)	139 (54)	0 (0)	257 (95)
1/11/03	99 (19)	97 (22)	2 (0)	198 (41)
1/14/04	76 (18)	58 (20)	4 (1)	138 (66)
2/7/05	215 (37)	160 (32)	8 (0)	383 (69)
1/19/06	127 (20)	137 (42)	12 (0)	276 (62)
Source: Virginia Department of Game and Inland Fisheries				

Threats to the Species - Although the bald eagle has rebounded over the past 25 to 30 years, current patterns of habitat loss in the Chesapeake Bay region are likely to eventually slow or halt this recovery. Shoreline development throughout the Chesapeake Bay is reducing available habitat and poses the single greatest threat to the eagle population. Nesting, roosting, and foraging habitat is being lost to shoreline development for housing, business, industry,

recreational facilities, public utilities, transportation, etc. Timber harvesting is also resulting in the loss of eagle habitat. As the human population along these shorelines continues to grow, more undisturbed wooded habitat used by bald eagles will be permanently altered. In addition, water-based recreation in the Chesapeake Bay region has increased dramatically since the 1970s, resulting in disturbance to eagles in breeding, roosting, and foraging areas.

Removal of shoreline vegetation results in disturbance to eagles and loss of habitat. Clark (1992) found that within the Powell Creek Concentration Area on the James River, Virginia, eagle abundance increased with increases in woodland width (defined as maximum width of woodland in each sampling plot measured in meters inland from the shore), snags (defined as number of standing dead trees over five meters in height on the shore of each sampling plot), and woodland length (defined as maximum length of woodland in each sampling plot measured in meters along the shoreline), which are indicative of the amount of forest habitat available. These three variables indicated lack of development, presence of a vegetative screen from human activities, and the presence of perching habitat. Removal of tall, large diameter trees will decrease the amount of perching and roosting habitat available (Buehler *et al*. 1991b). Luukkonen *et al*. (1989) recommended maintaining shorelines with forested buffers at least 100 m wide. The buffer should have a minimum of one tree per 250 m of shoreline that is at least 40 cm in diameter at breast height, is accessible to eagles, and contains suitable perching limbs. They also recommended conserving trees greater than or equal to 61 cm in diameter at breast height.

Chronic human activity may result in disuse of areas by eagles. Buehler *et al*. (1991b) found that bald eagle use of shoreline was inversely related to building density (magnitude of effect was greatest in summer) and directly related to the development set back distance. Clark (1992) concluded that "increased numbers of waterfront buildings and decreased amounts of shoreline woodland . . . negatively affect eagle shoreline use." Clark (1992) found that eagle numbers decreased with increased numbers of buildings and amount of medium duty roads. Buehler *et al*. (1991a) found that in the northern Chesapeake Bay, 76% of shoreline areas may be unsuitable for eagle use because of the presence of development within 500 m of the shoreline. Up to an additional 10% of the shoreline was found to be unsuitable at times because of boat and pedestrian traffic. When shoreline is developed, it is irretrievably lost as eagle habitat (Buehler *et al*. 1991b). Human activity resulting in even temporary disruption of the bird's environment represents a major source of potential disturbance in many eagle populations (McGarigal *et al*. 1991, Stalmaster and Kaiser 1998). Human activity in perching areas can interrupt feeding and cause birds to relocate (Fraser 1988, Stalmaster and Kaiser 1998). Watts and Whalen (1997) examined eagle density as a function of human presence and their results suggest that the presence of people had a negative effect on shoreline use by eagles. Watts and Whalen (1997) stated that ". . . it is clear that eagles avoid shoreline segments that regularly have people within 100 m of the water." Buehler *et al*. (1991b) seldom observed eagles on the northern Chesapeake Bay within 500 m of human activity and found that the birds rarely used developed areas or areas frequented by people on foot. During the summer, birds on the northern Chesapeake Bay flush when humans get to an average of within 175 m (Buehler *et al*. 1991b). Once birds are disturbed, they do not return to the area until several hours after the disturbance has occurred and

only when the disturbance no longer persists (Stalmaster and Newman 1978, Stalmaster and Kaiser 1998).

Buehler *et al*. (1991b) stated, "We assume there is an upper limit to the number of eagles that can be supported by any stretch of undeveloped shoreline. Thus, as shoreline continues to be modified, we believe that the length of remaining undeveloped shoreline may become the limiting factor for some eagle populations, including the Chesapeake population." Bald eagles in Virginia will maintain sustainable numbers only if there is adequate habitat for nesting, roosting, and foraging free from human disturbance. Management to preserve and protect these shoreline areas is essential to the continued growth and recovery of the Chesapeake Bay's nesting, summering, and wintering bald eagle population.

Feeding behavior of bald eagles can be disrupted by the mere presence of humans (Stalmaster and Newman 1978, Stalmaster and Kaiser 1998). Early morning human activities are potentially the most disruptive to eagle foraging activity (McGarigal *et al*. 1991, Stalmaster and Kaiser 1998). Disturbance may result in increased energy expenditures due to avoidance flights and decreased energy intake due to interference with feeding activity (Knight and Knight 1984, McGarigal *et al*. 1991, Stalmaster and Kaiser 1998). "The difference between the presence of a species when food is available versus the ability of that species to utilize the food is important. Whereas scavengers might be present in an area and appear to be unaffected by human activity, closer inspection would be required to determine whether the individuals are actually able to feed on that food" (Knight *et al*. 1991). Camp *et al.* (1997) found that wildlife responds to disturbance physiologically before responding behaviorally. They stated that heart rate increases and attention is diverted to human activities at a distance greater than what actually causes the wildlife to flush. Knight *et al*. (1991) examined winter bald eagle concentration areas in Washington and found that when anglers (not in boats) were present, fewer bald eagles were feeding and the eagles shifted their foraging from early morning to late afternoon. ". . . the presence of anglers disrupted feeding, which reduced energy intake and increased energy expenditure through avoidance flights. The ultimate effect of such disturbances on energy budgets and individual fitness is unknown" (Knight *et al*. 1991).

During particular stages of the nesting cycle, bald eagles are very sensitive to human disturbances around nest sites. Depending on the specific site and pair, even minor disturbance may cause a loss of feeding opportunity, loss of eggs or small chicks due to exposure, or complete abandonment. For breeding birds with chicks, loss of foraging time within the feeding territory may result in a decline in brood provisioning that may result in brood reduction or complete failure, depending on the severity of the energy shortage (Watts 2006b). Construction activity has been shown to adversely impact bald eagles during the breeding season within the Chesapeake Bay (Therres *et al.* 1993). Human disturbance and activities associated with construction have been shown to cause nest abandonment, nest failure, and/or loss of foraging opportunities. Disturbance that occurs with enough frequency to keep adults off the nest and prevent them from regulating the temperature of eggs or small chicks or from providing enough food to the brood to allow them to thrive, may cause complete abandonment of the site (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Human activity in the surrounding uplands (within 100 m of the shoreline) has been shown to affect shoreline use by eagles. A comparison of shoreline use by eagles within both the James and Rappahannock River Bald Eagle Concentration Areas showed that just one person in the uplands had a negative influence on eagle use (Watts and Whalen 1997, Watts 1998a). Because bald eagles avoid contact with humans, consistent human activity may prevent eagles from using locations. For this reason, chronic (i.e., daily) human disturbance within potential foraging habitat would effectively render those areas unsuitable and prevent eagles from accessing prey populations. Over time, the loss of access to the prey resources associated with human-impacted shorelines reduces the capacity of the area to support eagles and the population would decline to a new equilibrium with the remaining landscape. For non-breeding birds, this loss would result in a reduction in use of both the shoreline and associated communal roosts as birds are forced to focus activities in other areas. This represents a loss of foraging habitat for migrant populations during the non-breeding period of their annual cycle. For breeding birds, this loss may result in nest failure and ultimately in territory abandonment, potentially leading to a reduction in the local breeding population (Watts and Parsons Transportation Group Inc. of Virginia 2006).

For non-breeding birds, loss of foraging opportunity may have an impact on their daily energy budget. However, non-breeding birds are not tied to specific foraging areas and so, in most situations, should be able to compensate for losses by moving to alternate foraging locations as long as suitable alternate foraging areas exist. It is unlikely under normal circumstances that this disruption in foraging would reduce survivorship in non-breeding eagles. Chronic disturbance within primary foraging areas has also been shown to change roost use (Watts 2006b). For example, construction of a fishing pier in Charles City County caused a shift in the distribution of foraging eagles and the use of communal roosts (Watts 1995). Shifts in both foraging and roosting areas could result in long-term population impacts if suitable alternate locations are lost due to development of shoreline areas around the Chesapeake Bay and its tributaries.

It has been documented that eagles are more tolerant of sounds when the sources were partially or totally concealed from their view (*e.g.*, Stalmaster and Newman 1978, Wallin and Byrd 1984). Strips of vegetation that reduce line-of-sight will allow closer presence of humans and provide perching and roosting trees (Stalmaster and Newman 1978). Stalmaster (1980) recommended restricting land activities 250 m from eagles perched in shoreline trees to protect 99% of the birds. He suggested that boundaries could be shortened to 75 to 100 m in width if at least 50 m of this zone contains dense, shielding vegetation.

Boating activity is likely to adversely impact eagles because it disrupts feeding activity and affects large areas in short periods of time (Knight and Knight 1984). Activities of recreational boaters are not predictable and thus are especially disruptive to birds (Wallin and Byrd 1984). McGarigal *et al*. (1991) found that eagles usually avoided an area within 200 to 900 m of a single stationary experimental boat, with an average avoidance distance of 396 m. During this time, eagles spent less time foraging and made fewer foraging attempts. McGarigal *et al*. (1991) recommended a 400 to 800 m wide buffer around high-use foraging areas. Knight and Knight

(1984) studied wintering eagles in Washington and found that a 350 m wide buffer would protect 99% of birds perched in shoreline trees from a single canoe. However, eagles feeding on the ground were more sensitive to disturbance and required larger buffers. Knight and Knight (1984) found that a buffer of at least 450 m would be required to protect 99% of eagles feeding on the ground from a single canoe.

Stalmaster and Kaiser (1998) studied wintering eagles on the Skagit River in Washington and found that eagles foraging on the ground were intolerant of humans within 300 m, especially in the morning and that the, ". . . manner in which eagles responded to motorboats demonstrated that this activity was extremely disruptive to the population, even though only a small number of humans were involved." Luukkonen *et al*. (1989) studied non-breeding eagles in North Carolina and found "eagles and people tended to concentrate their activities on different portions of both lakes." They estimated that boat densities of more than 0.5 boats/km^2 altered eagle distribution patterns. "Disturbance by boaters or others may negatively affect eagle energy budgets by causing unnecessary eagle movements and by displacing eagles from foraging areas" (Luukkonen *et al*. 1989). Wood and Collopy (1995) studied breeding and non-breeding eagles on three lakes in Florida. They found a significant negative relationship between boat numbers and eagle numbers on one of the lakes. The other two lakes did not show this relationship but did not receive as much boat traffic. Boat use was highest on weekends and eagle use was highest on weekdays. Moving boats seemed to be more disruptive than stationary boats. Boating activity reduced the number of eagles using the shoreline, increased the perching distance from the shoreline, and increased the flushing distance (mean flush distance was 53 m).

Moving boats, as well as stationary boats, disrupt eagles. Buehler *et al.* (1991b) found that on the northern Chesapeake Bay, eagles were flushed by an approaching boat at an average distance of 175 m. Watts and Whalen (1997) studied boats and eagles on the James River. They found that nearly 25% of eagles perched on the shoreline flushed when their survey boat was within 200 m of the shoreline. When the boat was within 100 m of the shoreline, nearly 80% of the birds flushed. During shoreline surveys, they found that nearly 50% of all boats observed were within 200 m of the shoreline and over 35% were within 100 m. Jon boats, jet skis, and bass boats tended to be closer to the shoreline than sport boats (defined as v-hull type boats). "The general distribution of boats relative to the shoreline . . . in combination with the observed flushing probabilities . . . suggest that a large number of boats may directly influence shoreline use by eagles" (Watts and Whalen 1997). Their data analysis suggested that the presence of boats within 200 m of the shoreline has a significant negative effect on shoreline use by bald eagles. In the Rappahannock River, Watts observed that the response of eagles that were perched along the shoreline increased as the survey boat approached. Nearly 20% of eagles flushed when the boat was 200 m from the shoreline and nearly 70% flushed when the boat reached 100 m from the shoreline. Eighty percent of boats observed were within 200 m of the shoreline and nearly 65% were within 100 m of the shoreline (Watts 1998b).

Watts and Whalen (1997) stated that "a significant negative correlation was found between number of boats and eagle observations . . ." They documented a total of 80 human-caused bald eagle disturbance events on the James River; 74 caused by boats, 5 caused by people on shore,

and 1 caused by a truck passing close to shore. Of the 80 disturbance events, 66 were documented during the morning and 14 during the afternoon. There was no difference in timing of morning disturbance between weekdays and weekends. Most boat/eagle interactions occurred outside of the main channel. The frequency of fishing boats (defined as bass boats or boats with similar profiles; the boat occupants were not necessarily fishing at the time of observation) stopping in the main body of the river was less than for other types of boats. The frequency of sport boats (defined as v-hull type boats) that stopped (64.8%) was more than that of other boat types. The location of stationary boats was documented; 62.2% were close to shore and 37.8% occurred in the river channel. "The majority of the boat stops lasted for 10 minutes or less, however, some boats anchored for several hours." Overall, 73.7% of boats passed through, 12.6% of boats stopped, and 14.2% of boats used tributaries. Ninety percent of all boats entering tributaries were fishing-type boats. Nearly 75% of all boats observed outside of the channel were fishing-type boats. Forty-eight of 51 disturbances caused by boats outside of the channel resulted from eagles being flushed when a boat approached close to the shoreline. The majority (51.2%) of boat/eagle interactions involved fishing boats. "The frequency of sport boats causing disturbances was less than the frequency of sport boats observed . . . because most activity by these boats was confined to the channel. The frequency of industrial boats involved in disturbances [15.5%], however, was greater than the frequency of industrial boats observed [4.7%] during surveys . . ." (Watts and Whalen 1997). All disturbance from industrial boats was caused by flushing of perched eagles when the boat wake struck the shore. Watts and Whalen (1997) concluded that when compared to other types of boats, fishing boats were most likely to leave the channel, pass into tributaries, and cause eagle disturbances. Fishing boats also frequented nearshore areas throughout the day, suggesting that a single boat may disturb eagles along a considerable amount of shoreline. "Fishing boats are typically spaced out along the shoreline such that several boats may disturb long stretches of shoreline" (Watts and Whalen 1997). Fishing boats are most likely to be present during early morning hours when eagle foraging is at its peak (Stalmaster and Kaiser 1998).

Watts (1998) studied boat use within the Rappahannock River Bald Eagle Concentration Area. He found that sections of river just upstream of Tappahannock and near Port Royal tended to have the greatest use. These distributions reflected the major population centers and water access points. From a sample of 199 boats, types included sport boats (41.4%), bass boats (32.9%), jon boats (12.9%), sail boats (5.7%), and jet skis (2.9%). Within both the James and Rappahannock River Bald Eagle Concentration Areas, boat type was associated with the likelihood of impacting foraging eagles along the shoreline (Watts and Whalen 1997, Watts 1998b). Recreational fishing boats tend to get onto the water earlier and disturb eagles during their primary foraging period compared to sport boats. These boats also tend to impact a greater portion of the shoreline compared to pleasure boats that tend to move more frequently along marked channels. Smaller craft such as bass boats and jet skis have more potential to impact eagles because they have shallow drafts and are more capable of moving closer along the shoreline and accessing shallow coves (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Clark (1992) found that within the Powell Creek Concentration Area in Prince George County,

Virginia, eagle abundance decreased with increased numbers of "boat landings." Boat landings were defined as ". . . piers, boat ramps, and sites where boats are regularly landed or anchored on the shore. . . ." Wallin and Byrd (1984) had similar findings within the Caledon Concentration Area on the Potomac River. Clark (1992) recommended that additional boat landings within or adjacent to the Powell Creek Concentration Area be discouraged, including those on tributary Creeks of the James River.

Chemical poisoning and shooting are now less of a threat than in past years, but continue to cause loss of eagles. The Service, U.S. Environmental Protection Agency, and the states monitor pesticide-related eagle mortalities; restrictions on some types of pesticides have resulted from eagle mortalities. With increased petrochemical transport activities in the Chesapeake Bay region, the potential exists for eagles to come into contact with oil resulting from spills. Eagle deaths occasionally occur throughout the species' range due to collisions with power lines or electrocutions at power poles. In Virginia, power companies have voluntarily agreed to place "perch guards" on many power poles that have a high risk of eagle electrocution.

In reaching a decision of whether the Route 624 bridge repair project is or is not likely to jeopardize the continued existence of the bald eagle, the Service must factor into its analysis, previous biological opinions.

Since 1992, there have been ten non-jeopardy biological opinions and incidental take permits anticipating take of the bald eagle in Virginia. These opinions have addressed anticipated take at bald eagle concentration areas, nests, or both. Take has been in the form of harm and harassment. Take within concentration areas has not been quantified and take associated with eagle nests has typically included the nesting pair and their eggs or eaglets. The following are brief descriptions of the biological opinions that have been completed for this species:

- March 13, 1992: The Service submitted a non-jeopardy biological opinion to the Norfolk District Corps of Engineers for the proposal by Charles City County, Virginia to construct a public fishing pier, riprap, four fish attracting structures, scenic outlooks, nature trails, a boardwalk, picnic facilities, two parking lots, and temporary and permanent restroom facilities on the James River at the terminus of Route 618. In this biological opinion the Service also addressed a proposal by the Virginia Department of Transportation to widen Route 618 to allow improved access to the park. The project action area was defined as the 9.7 ha (24-acre) County Park, the adjacent uplands, and the section of the James River fronting on the County Park property. The project was expected to result in harm and harassment within the action area, but the number of eagles to be harmed or harassed was not estimated.

- June 30, 1992: The Service submitted a non-jeopardy biological opinion to the Norfolk District Corps of Engineers for the proposal by Virginia Power Company to construct a 230 kilovolt, 43.1 km-long aerial transmission line across the James River in Chesterfield and Henrico Counties, Virginia. Approximately 15 km of the new line would be located on new right-of-way. The project action area was determined to be the Presquile

National Wildlife Refuge, Curles Neck Farm, the Slash, and Jones Neck including the James River and associated shoreline from Presquile National Wildlife Refuge to Jones Neck. Incidental take in the form of harassment was not specified but harm from collisions with transmission lines was estimated to be one eagle every four years.

- June 30, 1993: The Service submitted a non-jeopardy biological opinion to the Norfolk District Corps of Engineers for the proposal by five applicants to provide private recreational access to the James River and to protect eroding shorelines of the James River in Prince George County, Virginia. Applicants proposed to construct piers, boat ramps, boathouses, a bulkhead, and to place shoreline riprap. The project action area was defined as the James River between Powell and Wards Creeks and 500 m inland from the James River shoreline between these Creeks. Incidental take in the form of harassment and harm was anticipated but the amount of incidental take was not specified.

- September 18, 1996: The Service submitted a non-jeopardy biological opinion to the Norfolk District Corps of Engineers for the proposal by a private citizen to provide private recreational access to the Potomac River and to protect eroding shorelines in King George County, Virginia. The applicant proposed to install a boat ramp, community pier, bulkhead, groins, concrete breakwaters, and six community mooring dolphins. The project action area was determined to include the area of direct project development, 460 m of the Potomac River shoreline, and tributaries potentially impacted by boaters originating from the proposed boat ramp. Incidental take was anticipated in the form of harassment through disturbance by watercraft in the Potomac River and its tributaries. The amount of take was not specified.

- May 12, 1997: The Service submitted a non-jeopardy biological opinion to the Norfolk District Corps of Engineers for the proposal by a private applicant to construct a pier and four, free-standing mooring piles on the southern branch of Owens Pond in Northumberland County, Virginia. The project action area was defined as the area within 240 m of an active bald eagle nest near the project location. The Service anticipated that incidental take in the form of harm and harassment would be no more than two bald eagles.

- June 23, 1998: The Service submitted a non-jeopardy biological opinion to the Norfolk District Corps of Engineers for the proposal by Charles City County, Virginia to construct a public boat ramp on the James River. The project action area was defined as the mainstem James River and 750 linear feet landward of the shoreline on both sides of the River between the Benjamin Harrison Bridge and Tyler Creek. The Service anticipated that incidental take in the form of harm and harassment would be half of the bald eagles (45) utilizing the James River shoreline in the summer within the action area. Subsequent to issuance of the opinion, Charles City County withdrew the permit application.

- December 18, 2000: The Service submitted a non-jeopardy biological opinion to the

Norfolk District Corps of Engineers for the proposal by Arlington County Home Owner's Association to construct a 22.9 m-long by 6.1 m-wide rock groin and place 344 cubic meters of sand along 40 linear m of Chesapeake Bay shoreline in Northampton County, Virginia. The project action area was defined as a 177 m section of beach from Old Plantation Creek to Elliott's Creek. It was located within 230 m of an active bald eagle nest. Incidental take was expected to be in the form of harassment of one pair of adult bald eagles and death to their eggs or unfledged young.

- April 11, 2001: The Service submitted a non-jeopardy biological opinion to the National Park Service for current operations at Jamestown Island, James City County, Virginia. Current operations included vehicular access and maintaining facilities on the Island such as trash pick-up, storm debris clean-up, snow and ice prevention and removal, leaf removal, and routine maintenance activities. The project action area was defined as the land, water, and airspace within 402 m (1,320 feet) of an active bald eagle nest located on the western tip of Jamestown Island. The project was expected to result in harassment of an adult pair of bald eagles, less than the level that would cause nest abandonment.

- May 18, 2001: The Service submitted a non-jeopardy biological opinion to the Norfolk District Corps of Engineers for the proposal by Cresswell and Company, L.L.C. to construct a 123-m pier with 14 boat slips along Gunston Cove on Mason Neck in Fairfax County, Virginia. The project action area was defined as the Mason Neck Bald Eagle Concentration Area and inland areas within 230 m of the shoreline of Gunston Cove. The project was expected to result in incidental take in the form of harm and harassment of eagles within three shoreline segments of the bald eagle concentration area.

- March 4, 2003: The Service submitted a non-jeopardy biological opinion to the National Park Service, Colonial National Historical Park to expand visitor facilities, enhance research and educational activities, and further protect the archival materials at Colonial National Historical Park. The project action area was defined as a portion of the north and west park boundaries and the interpretive path around the remainder of the island. The action area was also defined as the land, water, and airspace within 402 m (1,320 feet) of three bald eagle nests. The project was expected to result in harassment or harm of one pair of bald eagles and their eaglets.

Recovery Goals and Accomplishments - The following provides information on current recovery goals and accomplishments towards delisting the species in the three recovery regions pertinent to this opinion. The reference for the following regional recovery information was the Federal Register, Volume 71, No. 32; Thursday, February 16, 2006.

Chesapeake Recovery Region

Delisting Goals: Sustain a nesting population of 300-400 pairs with average productivity of 1.1 young per nest over five years, and permanently protect enough habitat to support this nesting population and enough roosting and foraging habitat to support population levels commensurate with increases throughout the Atlantic Coastal area. Habitat protection will be accomplished

through landowner cooperation, land easements and acquisition, incentive programs, and a continuing effort to pursue broad-based shoreline protection through State legislation and policy initiatives.

Achievements: The numeric recovery goals were met in 1992 when the number of nesting pairs exceeded 300 nesting pairs, and the population has continued to increase with over 800 nesting pairs reported in 2003. The average productivity of 1.1 young per nest over 5 years has been met, with the average between 1998 and 2003 being 1.19 young per nest. The objective of permanently protecting enough habitat to sustain these population numbers has been partially met. Habitat has been protected for approximately 200 nesting pairs. These protected lands include, but are not limited to, National Wildlife Refuges, State management areas, National Park Service lands, and conservation easements. Since 1990, occupied breeding areas for the bald eagle have more than doubled in this region, indicating that habitat has not been a limiting factor and that potential nesting habitat is still available for an increasing population of bald eagles, despite land development pressures.

Approximately 75 percent of the nest sites in the Chesapeake Bay area are on private lands. Habitat protection continues to proceed. For instance, the State of Maryland, where 40 percent of the nesting pairs occur, has established the Chesapeake Bay Critical Area Program. This program regulates development and timber harvest operations within 305 m of the Chesapeake Bay and its tidal tributaries in Maryland. Approximately 70 to 80 percent of all eagle nests in Maryland are within the Critical Area. Much of the forested areas within the Critical Area will be conserved, which will likely contribute to the ability to meet the habitat preservation goal established in the recovery plan. In Virginia, state laws are not as protective of shoreline habitat, so eagle nesting and foraging habitat are more vulnerable to future losses.

Southeastern Recovery Region

Delisting Goals: The original recovery plan stated that delisting would be considered if the recovery trend continues for five years after reclassification goals are met, and the criteria for delisting would be developed when the species is reclassified from endangered to threatened. After reclassifying the species to threatened in 1995, the Southeastern States Bald Eagle Recovery Team reconvened to consider criteria for delisting. The current recommendations of the recovery team are to achieve 1,500 occupied breeding areas over the most recent three-year period, with average productivity of 0.9 young per occupied breeding area over the same three-year period, and have eight of eleven States meet their nesting and productivity goals.

Achievements: The delisting goal of 1,500 occupied breeding areas over the most recent three-year period has been met, with over 1,700 pairs counted in 2000. Production between 1997 and 2000 averaged 1.24 young per occupied territory, thus exceeding the 0.9 goal for the last surveyed consecutive three-year period. Individual population goals for all eleven States were first attained in 2000, and the population levels have continued to increase.

Northern Recovery Region

Delisting Goals: By the year 2000, establish 1,200 occupied breeding areas distributed over a minimum of 16 States with an average annual productivity of 1.0 young per occupied nest.

Achievements: The delisting goal was achieved in 1991, with 1,349 occupied breeding areas distributed over 20 States. Since 1991, average productivity was estimated to be greater than 1.0. In 2000, the Northern States Recovery Region had an estimated 2,559 occupied breeding areas. When the recovery plan was approved in 1983, nesting bald eagles were considered extirpated in Connecticut, Indiana, Kansas, Massachusetts, New Hampshire, Nebraska, and Utah, and there was no evidence that the species had ever nested in Vermont or Rhode Island. [Since publication of the Federal Register, bald eagles nested in Vermont in 2006 (Vermont Fish and Wildlife Department 2006)].

Currently, the Service is assessing the status of the eagle in each recovery region to determine the appropriateness of delisting.

III. ENVIRONMENTAL BASELINE

As defined in 50 CFR 402.02 "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas. The "action area" is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The direct and indirect effects of the actions and activities resulting from the federal action must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area.

The Service has determined that the action area for this project includes Cat Point Creek from its mouth to approximately 5.6 river km (3.5 river miles) upstream of the Route 624 bridge; a total distance of approximately 15.3 river km (9.5 river miles). It includes the entire width of the Creek up to 200 m from either shoreline at the mean low tide line. The width of the action area is based on information that the Service uses to evaluate human disturbance to bald eagles foraging and roosting in the concentration area (Watts 1998a).

Status of the Species Within the Action Area – Although Cat Point Creek is included within the Rappahannock River Bald Eagle Concentration Area, definitive information is not available on the use of Cat Point Creek by summering eagles. The intensive study conducted during the summer of 1998 focused on the main stem of the Rappahannock River and did not include tributaries such as Cat Point Creek (Watts and Parsons Transportation Group Inc. of Virginia 2006).

However, surveys of Cat Point Creek conducted in recent years (up to the Route 624 bridge), have documented 30-40 eagles along the Creek during the summer months (Portlock 2006). Limited trips upstream of the Route 624 bridge have documented up to 20 birds during the

summer months. The spatial distribution of eagles along the shoreline, however, has not been recorded (Watts and Parsons Transportation Group Inc. of Virginia 2006).

During the most recent survey of Cat Point Creek and Rappahannock River on January 19, 2006, a total of 276 eagles were counted, 71 (26%) of which were in Cat Point Creek. The survey was conducted from the mouth of Cat Point Creek, upstream to the Route 624. During the same survey, 21 bald eagles were observed in trees upstream of the Route 624 bridge (Spencer 2006). Observations took place from the survey boat located just downstream of the bridge. All eagles were within 90 m of the bridge and all flushed as the survey boat approached the bridge (Spencer 2006).

Regarding mid-winter surveys, over the ten years of survey, Cat Point Creek has become a focal area for eagles within the Rappahannock River Bald Eagle Winter Concentration Area (Table 2 and Figure 2). The number of eagles observed between the Rappahannock River and the first bend upstream of the Route 624 bridge has increased dramatically from an average of 25 between 1997 and 2001 to 61 between 2002 and 2006, with a high count of 95 birds detected during the mid-winter survey of 2002. This number represented 37% of the birds within the entire Rappahannock River Concentration Area during that year (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Over all years, eagles on Cat Point Creek represent >20% of all eagles detected within the greater Rappahannock River Concentration Area, which is a surprisingly large proportion for this size tributary, especially considering the counts did not extend beyond the sharp bend in the Creek just upstream of the Route 624 bridge. Within the Creek itself, the distribution of eagles has become more concentrated within recent years around the location of the Route 624 bridge. The underlying cause of this shift is not clear but may relate to the relatively deeper channel in the vicinity of the bridge and the availability of prey, such as gizzard shad. At present, this location is the highest-use shoreline segment within the greater Rappahannock River Bald Eagle Winter Concentration Area (Watts and Parsons Transportation Group Inc. of Virginia 2006). Numerous eagle communal roosts have been documented over the years within the Rappahannock River Concentration Area (Watts 2006b). However, relatively little work has been conducted along Cat Point Creek to locate communal roosts and document their seasonal use. Based on limited observations, there are two locations known to support communal roosts (Figure 3). The first is located within a pine stand along Cat Point Creek on the Rappahannock River National Wildlife Refuge (Tayloe Unit). This site was documented to support at least ten individuals during December 2004. The second site is located along the edge of a pine stand near Menokin Bay, more than a mile north of the Route 624 bridge project site. This site was documented to support at least 15 individuals in early 2006 (Watts and Parsons Transportation Group Inc. of Virginia 2006). Communal roosts are typically composed of assemblages of non-breeding eagles that may be composed of several to over 100 birds (Watts and Parsons Transportation Group Inc. of Virginia 2006).

There are currently eight active bald eagle nests in the Cat Point Creek watershed, four of which (Nests RI0204, RI0303, RI0503, and RI0601) are within the project action area approximately

200 m or less from the Cat Point Creek shoreline (Figure 1). Productivity of these nests in found in Table 3. As of 2006, all four nests were active but no productivity data were available at the time of this writing.

Table 3: Production of young in Cat Point Creek bald eagle nests during 2002 – 2006 (Watts 2005, Watts 2006b, Watts 2006c).*

Nest Number	2002	2003	2004	2005	2006
RI 0204	2	2	2	0	0
RI 0303	-	0	0	0	0
RI 0503	-	-	-	2	1
RI 0601	-	-	-	-	2

* Only nests within the project action area are listed.

Factors Affecting Species Habitat Within the Action Area – The action area for this biological opinion is located entirely in Richmond County, Virginia. Cat Point Creek is situated in the Coastal Plain physiographic province in northeastern Virginia in Richmond and Westmoreland Counties. The Cat Point Creek Watershed covers approximately 75 square miles and has nine major tributaries. The Creek is approximately 20 miles long and the average width of the watershed is five to six miles. The upper part of the watershed has steep slopes and the Creek valley is relatively narrow. Downstream, past the Route 637 bridge, the valley widens considerably and the Creek threads through large riparian wetlands. Further downstream, at approximately the 14.5 kilometer marker (14.5 km upstream from the mouth), the stream becomes a wide, tidal stream. Land use in the watershed is predominantly forestry and agriculture. The Cat Point Creek watershed contains mixed, pine, and hardwood forests (McKensie and Tabulenas 2004).

Historically, portions of Cat Point Creek up to the vicinity of the Route 637 bridge were used to transport tobacco and forest products downstream. After many years of sedimentation, water depths in the upper reaches of the Creek are too shallow for boats other than canoes or shallow-draft, flat-bottom boats (McKenzie and Tabulenas 2004). Historical boat use of portions of Cat Point Creek upstream of the Route 624 bridge is also reflected in the fact that the bridge was constructed as a swing span, though it is now welded shut (Watts and Parsons Transportation Group Inc. of Virginia 2006).

In general, Richmond County development is being concentrated in and around the primary growth center of Warsaw, which has public water and sewer that can accommodate increased development (McKensie and Tabulenas 2004). Most rural development is composed of residences along secondary roads. At present, there are no large-scale subdivisions in the watershed (McKensie and Tabulenas 2004). The entire Cat Point Creek watershed in Richmond County is zoned agricultural except for the Arrowhead Bluffs subdivision, which includes 13 residences, 12 of which are waterfront. The County recently amended an ordinance stating that prior to approval of major subdivisions (more than four lots), land must be rezoned from agricultural. There have been no new subdivisions or boat ramps constructed in the Cat Point Creek watershed within Richmond County in the last 2 years. According to the existing County

ordinances, one house may be constructed per agricultural parcel, without the need for rezoning (Duncanson 2006).

According to the U.S. Census Bureau, between 1990 and 2000, the population in Virginia increased by 14.4% and the Richmond County population grew by 21.1%. The current population of Richmond County is approximately 8,800. While data are not available by watershed, there are estimated to be between 3,000 and 4,300 residents in the Cat Point Creek watershed (McKensie and Tabulenas 2004).

There are a number of homes in the areas surrounding Cat Point Creek and there is a house located adjacent to the Creek at the west end of the bridge. Associated with the property is an existing dock and private boat ramp. Two thousand vehicles per day use the existing bridge. Each vehicle passing by generates noise, both as normal noise emissions from exhaust and tires and as a separate and distinct noise generated by the tires hitting the wooden deck portion of the existing bridge (Watts and Parsons Transportation Group Inc. of Virginia 2006).

According to 2002 aerial photography, there were 25 piers/boat houses/boat lifts on Cat Point Creek within the action area. Seventeen of these structures were downstream of the Route 624 bridge and eight were upstream (VDGIF 2006). Data provided to the Service from the Corps indicated that as of April 2006 there were permit records for ten piers, two boat ramps, and two boat lifts on Cat Point Creek. Permit records were from the early 1980s through the present (Allen-Grimes 2006).

Precise information about the exact numbers, types, or timing of boats currently using Cat Point Creek and the nearby Rappahannock River is not available. According to VDGIF, as of December 31, 2005, Richmond County had 1,092 active boat registrations. Essex County (across the Rappahannock River from Richmond County) had 1,856 registrations (Smith 2006). It can be reasonably assumed that many of these boats are operated on the Rappahannock River and its tributaries. Boat owners with property fronting the Rappahannock River or its tributaries can access the river directly. Boat owners without waterfront property can access the river via marinas or public access points in the area.

Quantitative data on the numbers and types of boats using each access site and the destination of boaters using them are not available. A study within the James River Concentration Area showed that boat distribution is influenced to a great degree by 1) ramps and other access points and 2) the distribution of navigable water (Watts and Whalen 1997). Boat traffic was also shown to vary with the time of day, weather conditions, and the type of day (weekend vs. week day). Boat traffic varies seasonally with more boats being on the water during the summer months (Watts and Whalen 1997). There are two known boat access points upstream of the Route 624 bridge. One is a private ramp adjacent to the existing bridge and will be replaced as part of the proposed bridge construction. It is not known how frequently it is used or for what kind of boat. The other is at Heritage Park Resort located approximately 2.7 km (1.7 miles) upstream of the Route 624 bridge. There is a wooden ramp on the property that is open to the public for a fee. The Resort manager stated that on a typical weekend day during non-winter months,

approximately 2 boats launch at his public ramp. When asked, he stated that it was not unusual to see bass boats on Cat Point Creek above the Route 624 bridge. Service personnel have also gathered data indicating that bass boats frequently get under the bridge to access the upper tidal reaches of Cat Point Creek, above the bridge (Petrie 2006). The Resort website advertises that "We have the only public boat ramp on Cat Point Creek and miles of shoreline offering undisturbed fishing ground."

There are two marinas in the project area; Garrett's Marina and Harborside Storage, located approximately eleven miles south of the Route 624 bridge, and the June Parker Marina located in Tappahannock, approximately four miles southwest of the bridge. Garrett's Marina has space for 400, 20-23-foot boats. Uses of boats from Garrett's Marina range from skiing to fishing and pleasure boating. The June Parker Marina has space for approximately 80 boats ranging in size from 18 to 24 feet (5.5 to 7.3 m). Boats also range in use from skiing to fishing and pleasure boating, although fishing is the largest use. According to marina staff, many of the larger fishing boats travel downstream to salt water areas. There are at least nine public boat ramps in the vicinity of the project area (Table 3). Four are concrete boat ramps funded and managed by VDGIF (Hoskin's Creek, Carter's Wharf, Totuskey, and Simonson Landing) (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Table 4: Public boat ramps in the vicinity of the Route 624 bridge project (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Access Site	Water Body	County	Road	Distance/Direction From 624 Bridge	Distance in River km **
Hoskins Creek	Hoskins Creek	Essex	Dock Street in Tappahannock	8 km southwest	15.8
Prince Street	Rappahannock River	Essex	Prince Street in Tappahannock	7.2 km southwest	14.1
Wares Wharf	Rappahannock River	Essex	Route 611	12.9 km south	23.3
Piscataway	Piscataway Creek	Essex	US Route 17	12.9 km south	26.1
Heritage Park Resort	Cat Point Creek	Richmond	Newland Road	1.6 km northwest	2.7
Carters Wharf	Rappahannock River	Richmond	Carter's Wharf Road	12.9 km northwest	24.1

Naylors Beach**	Rappahannock River	Richmond	Route 636	4.8 km southwest	10.4

**USFWS 2006.

In addition to the ramps listed above, there is a private (fee) ramp located at Naylors Beach, just upstream from the mouth of Cat Point Creek on the Rappahannock River. It is located approximately 10.4 river km from the Route 624 bridge.

On January 6, 2006, the VDGIF game warden who patrols Cat Point Creek indicated that boat traffic on the Creek appears to be influenced by season and weather, is often high during the summer months, and is elevated when conditions are windy on the Rappahannock River. Boats from the Naylor's Beach area and from Tappahannock come up the Creek during windy days because it is sheltered. The warden further indicated that most of the boat traffic is between the mouth of the Creek and the Route 624 bridge, with only small jon boats and jet skis typically moving under the bridge to access the upper reach (Watts and Parsons Transportation Group Inc. of Virginia 2006).

During a reconnaissance survey of the Route 624 bridge on May 16, 2006, Service personnel measured the vertical clearance from water level to the lowest bridge support beam to be 1.6 m During low tide, in an 18 foot aluminum jon boat with a 25 horsepower outboard, personnel reached a point just upstream of the mouth of Woodville Creek before further navigation upstream became impossible. The mouth of Woodville Creek is approximately three miles upstream of the Route 624 bridge.

IV. EFFECTS OF THE ACTION

Beneficial Effects – Beneficial effects are those effects that are wholly positive, without any adverse effects. As defined, there are no beneficial effects in the proposed action.

Direct Effects – The proposed project would adversely affect bald eagles by harassment during construction due to increased noise levels and human activity from pile driving, waterborne construction craft, and heavy land-based equipment. During the construction period of up to 14 months, eagles may avoid an area within 750 feet upstream and downstream of the bridge. Since surveys have shown relatively high eagle usage of the area around the existing bridge, this level of disturbance over 14 months may have a significant effect on their foraging behavior. Such impacts may be minimized by limiting construction activities to late morning and afternoon while eagles are most abundant in Cat Point Creek.

Interrelated and Interdependent Actions - As defined in 50 CFR 402.02, interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. No activities interrelated to and interdependent with the proposed action are

known at this time.

Indirect Effects – Indirect effects are defined as those that are caused by the proposed action and are later in time, but are still reasonably certain to occur (50 CFR 402.02). The increased size of the bridge and anticipated increase in traffic may result in a reduction or elimination of bald eagles foraging within the vicinity of the new structure. The extent of this effect is difficult to predict. For some reasons, eagles seem to congregate disproportionately in the section of Cat Point Creek near the Route 624 bridge (Figure 2). Eagles that are more adapted to disturbance may continue to forage in the vicinity of the new bridge while less tolerant eagles may move elsewhere to feed.

Indirect effects to eagles will also result from raising the vertical clearance of the bridge. "Based on the type and size of boats on the Rappahannock River in the vicinity of Tappahannock, raising the height of the bridge at mean high water from 4 feet to 10 feet (1.2 to 3 m) would permit many additional boats access to the upper reach of Cat Point Creek, provided they have shallow drafts . . ." (Watts and Parsons Transportation Group Inc. of Virginia 2006). Available observations suggest that the majority of the boat traffic within Cat Point Creek is downstream of the Route 624 bridge, due primarily to the vertical clearance restriction posed by the existing bridge, but also to the lack of waterfront development and the smaller and shallower channel upstream (Watts and Parsons Transportation Group Inc. of Virginia 2006).

As noted earlier in this biological opinion, Watts (1998b) observed that disturbance of eagles perched along the Rappahannock River shoreline increased as the survey boat approached. Almost 20% of the eagles flushed when the boat was 200 m from the shoreline and nearly 70% flushed when the boat reached 100 m from the shoreline. Over 75% of all eagles flushed when the boat was less than 50 m from the shoreline. Regarding the influence of boats on shoreline use, out of 44 separate comparisons, 36 segments had higher eagle densities in the absence of boats, 4 had higher densities in the presence of boats, and there were 4 segments in which eagle densities and boats were indiscernible (Watts 1998a).

At its widest point near the mouth, Cat Point Creek is approximately 760 m wide. At the upper terminus of the action area, Cat Point Creek is approximately 30 m wide. On average, the deepest channel (thalweg) is located in the middle of the waterway, and approximately 75% of the entire length of Cat Point Creek within the action area is less than 200 m wide. Assuming that a typical boat will travel in the middle of the channel, equidistant from both shorelines, watercraft traveling up or downstream in Cat Point Creek will be less than 100 m from shoreline over 75% of the time. Since nearly 70% of all eagles flushed when a vessel came within 100 m (Watts 1998b), a single vessel would flush nearly 70% of all eagles on 75% of the Cat Point Creek shoreline. Of course, not all boats will stay within the channel and many (especially fishing boats) will be found in shallower water, nearer the shoreline and could flush a higher percentage of the eagles on a given stretch of shoreline.

The Service anticipates that the proposed bridge would likely result in an increase in boat traffic in the action area during summer months and to a lesser degree during the winter. The

anticipated increase in all forms of recreational boat use in the action area would result in disturbance to bald eagles throughout the action area. This disturbance is anticipated to be severe enough to disrupt the normal daily activity patterns of the bald eagle, including, but not limited to, activities such as foraging, perching, nesting, and feeding young. Such impacts can be minimized by maintaining the height of the new bridge substructure to that of the existing bridge.

V. CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

According to the U.S. Census Bureau, the population of Richmond County, Virginia increased by over 21% between 1990 and 2000 and increased by 2.2% between April 1, 2000 and July 1, 2004 (U.S. Census Bureau 2006). During the same time periods, the statewide population grew by 14.4% and 5.4%, respectively. Given the continuing population growth in Richmond County and the Commonwealth of Virginia, and the increasing demand for second homes on the water, it is likely that the waterfront and other development in the action area will continue. This is likely to result in additional shoreline development and recreational watercraft use within the action area.

There are currently at least two factors that limit watercraft activity above and, to a lesser degree, below the Route 624 bridge. They include the vertical clearance from the waterline to the bridge support structure and the shallow depth of the channel. The proposed bridge would result in a heightened vertical clearance that, by itself, would allow for an increase in boat traffic. In the future, with increased waterfront development and boat ramps upstream, there could be additional interest in dredging the existing channel to allow passage of larger watercraft above the bridge.

These development pressures from increasing population, waterfront homes, etc., would not only increase watercraft traffic within the action area, but would likely result in increased human activity on the Cat Point Creek shoreline from clearing riparian forests for housing and lawns, additional road construction, and increased automobile and pedestrian traffic within the action area. Additional development would also result in construction of piers, boathouses, bulkheads, boat ramps, and similar structures. Increased development and human use of the Cat Point Creek shoreline and waterway could significantly reduce available habitat for eagles over time.

VI. CONCLUSION

Regulations implementing Section 7(a)(2) of the ESA (50 CFR 402) require the Service to formulate its biological opinion as to whether a Federal action that is the subject of consultation, taken together with cumulative effects, is likely to jeopardize the continued existence of listed

species or result in the adverse modification of critical habitat. "Jeopardize the continued existence of . . . ," is defined by this regulation as, to engage in an action that would reasonably be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. Destruction or adverse modification of critical habitat is defined as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

After reviewing the status of the bald eagle, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the Route 624 bridge replacement, as proposed, is not likely to jeopardize the continued existence of the bald eagle. The impacts of the proposed bridge and a subsequent increase in boat traffic in the action area would adversely affect and reduce bald eagle habitat within the action area. The anticipated increase in boat traffic and nearshore development is likely to cause significant declines in bald eagle use of the action area and could result in the eventual abandonment of this section of the summer eagle concentration area. If this occurs, the summering, post-breeding, migrating, and resident birds from the three bald eagle recovery regions using this area may move into other habitat patches in adjacent areas, if any are available. Impacts are likely to include increased disturbance from human activities caused by the forced use of fragmented habitat, resulting in decreased energy intake, increased likelihood of injury or death, and decreased productivity. No critical habitat has been designated for this species; therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited take under the ESA provided that such take is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary and must be undertaken by FHWA, the

Corps, and the U.S. Coast Guard (Coast Guard), and/or become binding conditions of any permit, license, grant, or contract issued by FHWA, the Corps, or the Coast Guard for the exemption in section 7(o)(2) to apply. FHWA, the Corps, and the Coast Guard have a continuing duty to regulate the activity covered by this incidental take statement. If FHWA, the Corps, or the Coast Guard (1) fail/s to assume and implement the terms and conditions, or (2) fail/s to require any applicant, licensee, grantee, or contractor to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, license, grant, or contract document, the protective coverage of Section 7(o)(2) may lapse.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

Based on VDGIF data (VDGIF 2006), on average there have been 46 eagles observed on Cat Point Creek during mid-winter surveys conducted annually from 1997 – 2006. Summer surveys have not been conducted in a systematic fashion, however, surveys of Cat Point Creek conducted in recent years (upstream to the Route 624 bridge), have documented 30-40 birds along the Creek during the summer months. Limited trips upstream of the Route 624 bridge have documented up to 20 birds during the summer months (Portlock 2006).

Incidental take is anticipated in the form of harm and harassment to foraging and nesting eagles in the Cat Point Creek watershed. Foraging habitat within 750 linear feet upstream and downstream of the bridge is likely to be eliminated or severely reduced during the 14-month construction period and perhaps permanently lost. Foraging habitat within the entire action area (15 river km) may be reduced or eliminated due to increased boating activity resulting from the higher bridge. However, incidental take of foraging bald eagles will be difficult to detect because, 1) it is difficult to quantify the increased boat usage of the action area that will result from this project, and 2) when habitat loss or disturbance occurs, direct killing/immediate death of birds is not likely. Instead, loss of vigor, depressed reproductive rates, and relocation to marginal habitat are expected. While these types of activities are likely to result in injury and may, in some cases, lead to death, they are not easily observed and finding a dead or impaired specimen is unlikely. Almost all boats traveling up or down Cat Point Creek will flush eagles when eagles are present. Because the use of boats is difficult to predict precisely and eagle numbers may vary on a given shoreline segment, the total acreage of disturbance cannot be quantified. Additional boats moving along the shoreline could functionally eliminate a significant portion of the shoreline and riverine habitat from eagle use for an entire day and, over time, could lead to abandonment.

FWS anticipates take associated with bald eagle nests RI0303, RI0204, RI0503, RI0601 as a result of this proposed action. The incidental take is expected to be in the form of harassment of the adult pairs, potentially to the level that would cause nest abandonment and harassment or harm of the eaglets, potentially to the degree that would cause them to jump prematurely from the nest and die, or die of starvation when adults are stressed due to disturbance, and cannot adequately feed the eaglets.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of bald eagles:

- Bridge construction must be conducted during the time of year and time of day when impacts to eagles in the project vicinity are minimized.

- Monitor bald eagle use following bridge construction.

TERMS AND CONDITIONS

To be exempt from the prohibitions of Section 9 of the ESA, FHWA, the Corps, the Coast Guard, and VDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are nondiscretionary.

1. During May 15 – September 15 and December 1 - February 28 of any year, most construction may be performed. To minimize disturbance to foraging eagles during these dates, pile/sheetpile driving may only occur between 10:00 a.m. to 4:00 p.m. During the remainder of the year, construction may proceed during all hours.

2. To document any impacts from the new bridge, FHWA/VDOT must perform monthly monitoring of the bald eagle population within 750 feet of the Route 624 bridge. Monitoring must be performed on or about the 15th day of each month for five consecutive years beginning in December 2006, and a monitoring plan must be approved by the Service prior to initiation of monitoring. Monitoring must be conducted by a bald eagle expert approved by the Service. Monitoring reports are due to the Service on May 15 and November 15 each year.

3. FHWA, the Corps, and the Coast Guard are required to reinitiate consultation with the Service if any conditions in the Corps or Coast Guard permits or FHWA funding for this project are modified or revoked.

4. Care must be taken in handling any dead specimens of proposed or listed species that are found in the project area to preserve biological material in the best possible state. In

conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, notify the Service at the address provided.

5. FHWA and/or VDOT are required to notify the Service before initiation of construction and upon completion of the project at the address given below. All additional information to be sent to the Service should be sent to the following address:

Virginia Field Office
U.S. Fish and Wildlife Service
6669 Short Lane
Gloucester, VA 23061
Phone (804) 693-6694
Fax (804) 693-9032

To the extent that this statement concludes that take of any threatened or endangered species of migratory bird will result from the agency action for which consultation is being made, the Service will not refer the incidental take of any such migratory bird for prosecution under the BGEPA or MBTA if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.
The Service believes that eagles will be harmed and harassed as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measures. FHWA, the Corps, or the Coast Guard must immediately provide an explanation of the causes of the take, and review with the Service the need for possible modification of the reasonable and prudent measures and the terms and conditions.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommends construction of a structure under the new bridge at the height of the existing bridge supporting substructure, so that vertical clearance for boats traveling under the

bridge is identical to the clearance currently in place. The horizontal structure should be a permanent fixture, permanently attached to the bridge, that cannot be moved by boaters. Prior to removal of the old bridge structure, VDOT should inform the Service, so that we may perform a site visit to ensure that the clearance of the new structure is no higher than the old structure.

For the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the initiation request. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The Service appreciates this opportunity to work with FHWA, the Corps, and the Coast Guard in fulfilling our mutual responsibilities under the ESA. If you have any questions, please contact William Hester of this office at (804) 693-6694, extension 134.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

LITERATURE CITED

Allen-Grimes, A. 2006. U.S. Army Corps of Engineers, Norfolk, VA. Personal communication.

Buehler, D.A., J.D. Fraser, J.K.D. Seegar, G.D. Therres, and M.A. Byrd. 1991a. Effects of human activity on bald eagle distribution on the northern Chesapeake Bay. J. Wildlife Management 55(2):282-290.

Buehler, D.A., T.J. Mersmann, J.D. Fraser, and J.K.D. Seegar. 1991b. Nonbreeding bald eagle communal and solitary roosting behavior and roost habitat on the northern Chesapeake Bay. Journal of Wildlife Management 55:273-281.

Byrd, M.S. unpublished data. 2006 *in* Watts, B.D. and Parsons Transportation Group Inc. of Virginia. 2006. Biological Assessment for bald eagle, Route 624 bridge replacement, Cat Point Creek. Virginia Department of Transportation, Richmond, VA. 35 pp.

Camp, R.J., D.T. Sinton, and R.L. Knight. 1997. Viewsheds: a complimentary management approach to buffer zones. Wildlife Society Bulletin 25(3):612-615.

Chandler, S.K., J.D. Fraser, D.A. Buehler, and J.K.D. Seegar. 1995. Perch trees and shoreline development as predictors of bald eagle distribution on Chesapeake Bay. Journal of Wildlife Management 59:325-332.

Clark, K.H. 1992. Shoreline foraging habitat selection by bald eagles (*Haliaeetus leucocephalus*) in a non-breeding eagle concentration area on the James River, Virginia. M.S. Thesis. College of William and Mary, Williamsburg, VA.

Duncanson, W.E. 2006. Richmond County Administrator, Warsaw, VA. Personal communication.

Fraser, J.D. 1988. A strategy for protecting bald eagles in Sullivan County, New York. Catskill Center for Conservation and Development, Inc., Arkville, NY.

Gerrard, J.M., P.N. Gerrard, and W.A. Whitfield. 1980. Behavior in a non-breeding bald eagle. Canadian Field-Naturalist 94:391-397.

Jaffee, N.B. 1980. Nest site selection and foraging behavior of the bald eagle (*Haliaeetus leucocephalus*) in Virginia. M.S. Thesis. College of William and Mary, Williamsburg, VA.

Keister, G.P., Jr. and R.G. Anthony. 1983. Characteristics of bald eagle communal roosts in the Klamath Basin, Oregon and California. Journal of Wildlife Management 47:1072-1079.

Knight, R.L. and S.K. Knight. 1984. Responses of wintering bald eagles to boating activity.

Journal of Wildlife Management 48:999-1004.

Knight, R.L., D.P. Anderson, and N. Verne Marr. 1991. Responses of an avian scavenging guide to anglers. Biological Conservation 56:195-205.

Luukkonen, D.R., T.J. Smith, D.N. Chester, J.D. Fraser, and D.F. Stauffer. 1989. Ecology, habitat and management of bald eagles at B. Everett Jordan Lake and Lake Falls, North Carolina. Department of Fisheries and Wildlife Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA.

McGarigal, K., R.G. Anthony, and F.B. Isaacs. 1991. Interactions of humans and bald eagles on the Columbia River estuary. Wildlife Monograph 115.

McKenzie, S. and T. Tabulenas. 2004. Cat Point Creek Watershed Management Plan. Virginia Department of Conservation and Recreation, Richmond, VA. 88 pp.

Petrie, Ray. 2006. Heritage Park Resort, Warsaw, VA. Personal communication.

Portlock, W.S. 2006. Chesapeake Bay Foundation, Richmond, VA. Personal communication.

Portlock, W.S. 1994. Rappahannock River bald eagles. The Raven. 65:38-43.

Smith, P. 2006. Electronic mail dated May 11, 2006. Virginia Department of Game and Inland Fisheries, Richmond, VA.

Spencer, S. 2006. Biologist, Rappahannock River Valley National Wildlife Refuge, Warsaw, VA. Electronic mail/personal communication.

Stalmaster, M.V. 1980. Management strategies for wintering bald eagles in the Pacific Northwest. Pages 49-67 in R.L. Knight, G.T. Allen, M.V. Stalmaster, and C. W. Servheen, eds. Proceedings of the Washington Bald Eagle Symposium. The Nature Conservancy, Seattle, WA.

Stalmaster, M.V. and J.L. Kaiser. 1998. Effects of recreational activity on wintering bald eagles. Wildlife Monographs 137:1-46.

Stalmaster, M.V. and J.R. Newman. 1978. Behavioral responses of wintering bald eagles to human activity. Journal of Wildlife Management 42:506-513.

Therres, G. D., M. A. Byrd, and D. S. Bradshaw. 1993. Effects of development on nesting bald eagles: Case studies from Chesapeake Bay. Maryland Dept. of Nat. Res., Wye Mills, MD 17 pp.

U.S. Census Bureau. 2006. http://quickfacts.census.gov/qfd/states/51/51159.html.

U.S. Fish and Wildlife Service. 1990. Chesapeake Bay region bald eagle recovery plan: first revision. Newton Corner, MA.

Vermont Fish and Wildlife Department. 2006. http://www.vtfishandwildlife.com/Detail.CFM?Agency__ID=973. Montpelier, VT.

Virginia Department of Game and Inland Fisheries. 2006. *in* Watts, B.D. and Parsons Transportation Group Inc. of Virginia. 2006. Biological Assessment for bald eagle, Route 624 bridge replacement, Cat Point Creek. Virginia Department of Transportation, Richmond, VA. 35 pp.

Virginia Department of Game and Inland Fisheries. 1994. Bald eagle management in Virginia: a comprehensive plan. Prepared by the Virginia Department of Game and Inland Fisheries, Richmond, VA.

Wallin, D.O. and M.A. Byrd. 1984. Caledon State Park bald eagle study. Department of Biology, College of William and Mary, Williamsburg, VA.

Watson, J.W., M.G. Garrett, and R.G. Anthony. 1991. Foraging ecology of bald eagles in the Columbia River estuary. Journal of Wildlife Management 55:492-499.

Watts, B.D. 2006a. College of William and Mary, Center for Conservation Biology. Electronic mail dated May 17, 2006.

Watts, B.D. 2006b. *in* Watts, B.D. and Parsons Transportation Group Inc. of Virginia. 2006. Biological Assessment for bald eagle, Route 624 bridge replacement, Cat Point Creek. Virginia Department of Transportation, Richmond, VA. 35 pp.

Watts, B.D. 2006c. College of William and Mary, Center for Conservation Biology. Electronic mail dated May 25, 2006.

Watts, B.D. 2005. Virginia bald eagle nest and productivity survey: Year 2005 report. Center for Conservation Biology Technical Report Series, CCBTR-04-03. College of William and Mary, Williamsburg, VA.

Watts, B.D. and Parsons Transportation Group Inc. of Virginia. 2006. Biological Assessment for bald eagle, Route 624 bridge replacement, Cat Point Creek. Virginia Department of Transportation, Richmond, VA. 35 pp.

Watts, B.D. 1998a. Investigation of bald eagles within the Rappahannock River Concentration Area. Center for Conservation Biology Technical Report, CCBTR-98-02. College of William and Mary, Williamsburg, VA. 65pp.

Watts, B.D. 1998b. Bald eagle and human use of the Rappahannock River bald eagle concentration area. Center for Conservation Biology Technical Report, CCBTR-98-02. College of William and Mary, Williamsburg, VA. 41 pp.

Watts, B. D. 1995. Eagle investigations within the James River concentration area (1993-1995). Center for Conservation Biology. College of William and Mary, Williamsburg, VA. 15pp.

Watts, B.D. and M.A. Byrd. 2005. Virginia bald eagle nest and productivity survey: Year 2005 report. Center for Conservation Biology Technical Report Series, CCBTR-05-05. College of William and Mary, Williamsburg, VA. 27 pp.

Watts, B.D. and M.A. Byrd. 2004. Virginia bald eagle nest and productivity survey: Year 2004 report. Center for Conservation Biology Technical Report Series, CCBTR-04-03. College of William and Mary, Williamsburg, VA. 27 pp.

Watts, B.D. and M.A. Byrd. 2003. Virginia bald eagle nest and productivity survey: Year 2004 report. Center for Conservation Biology Technical Report Series, CCBTR-03-03. College of William and Mary, Williamsburg, VA. 26 pp.

Watts, B.D. and M.A. Byrd. 2002. Virginia bald eagle nest and productivity survey: Year 2002 report. Center for Conservation Biology Technical Report Series, CCBTR-02-03. College of William and Mary, Williamsburg, VA. 24 pp.

Watts, B. D. and M. A. Byrd. 1999. Expansion of the James River Bald Eagle concentration Area. *The Raven*. 70:18-23 *in* Watts, B.D. and Parsons Transportation Group Inc. of Virginia. 2006. Biological Assessment for bald eagle, Route 624 bridge replacement, Cat Point Creek. Virginia Department of Transportation, Richmond, VA. 35 pp.

Watts, B.D. and D.M. Whalen. 1997. Interactions between eagles and humans in the James River bald eagle concentration area. Prepared by the Center for Conservation Biology, College of William and Mary, for the Virginia Department of Game and Inland Fisheries, Richmond, VA.

Watts, B.D., K.W. Cline, and M.A. Byrd. 1994. The bald eagle in Virginia: an information booklet for land planners. Center for Conservation Biology, College of William and Mary, Williamsburg, VA. 85 pp.

Wood, P.B. and M.W. Collopy. 1995. Population ecology of subadult southern bald eagles in Florida: post-fledging ecology, migration patterns, habitat use, and survival. Report to Florida Game and Freshwater Fish Commission, Tallahassee, FL.

Appendix. Consultation History

10-17-00 VDOT presents project proposal at the monthly interagency meeting.

01-20-04 Letter from the Service to U.S. Coast Guard expressing concern that increasing the vertical clearance below the bridge would allow increased watercraft traffic on the upper reaches of Cat Point Creek, and recommend that the Coast Guard solicit comments from landowners above the Route 624 bridge.

01-21-05 Letter from Service (Rappahannock River Valley NWR) to VDOT, Warsaw, Virginia noting the biological resources of Cat Point Creek, suggesting VDOT consider installing a below deck structure to maintain existing clearance under the bridge, and again suggesting that comments be sought from citizens living upstream from the bridge.

04-29-05 Letter from VDOT to the Service (Rappahannock River Valley NWR) indicating that the bridge location and design presented on January 11, 2005 had been approved. The recommendation made on 01-21-05 to install a substructure was not addressed.

05-05 Cat Point Creek Bald Eagle Concentration Area is designated by VDGIF and the Service.

05-17-05 Letter from the Service (Rappahannock River Valley NWR) to VDOT, Warsaw, Virginia, reiterating that VDOT install a below-deck structure to maintain the existing clearance under the bridge.

06-14-05 VDOT presents project proposal at the monthly interagency meeting.

07-19-05 Letter from VDOT to the Service stating that it would be difficult for VDOT to limit the vertical clearance of the proposed bridge.

07-25-06 Service letter to the Corps stating the Service's concern that the heightened vertical clearance could result in an increase in boat activity which could affect the bald eagle population in Cat Point Creek.

08-09-05 VDOT presents project proposal at the monthly interagency meeting.

08-30-05 Letter from the Service to VDOT stating that the proposed project location is within a designated bald eagle concentration area.

09-09-05 Interagency site visit of the proposed Route 624 bridge replacement.

09-26-05 Letter from the Service to FHWA stating that Cat Point Creek is a bald eagle

concentration area and recommending that the vertical clearance of the proposed bridge be maintained at its existing level, and recommending construction time-of-year restrictions. Provided these measures were taken, the Service stated that no further Section 7 consultation would be required.

12-20-06 Letter from the Corps to VDOT regarding VDOT's Route 624 permit application. Among other things, the letter states that after completion of Section 7 consultation with FHWA, any terms and conditions that apply to the bridge replacement would be conditions of the Corps permit.

01-12-06 Letter from Service to FHWA requesting a written notification on future Section 7 consultation plans and a written explanation for VDOT's inability to modify bridge plans.

01-12-06 Resolution by the Richmond County Board of Supervisors requesting that VDOT and FHWA address the bald eagles concerns stated by Federal and State authorities in order to keep the project construction on schedule and avoid delays.

02-27-06 Response letter from FHWA to the Service regarding the Service's January 12, 2006 letter. The letter stated that FHWA and VDOT were in agreement that maintaining the existing vertical bridge clearance was not prudent. FHWA also stated that a request for formal Section 7 consultation was pending.

03-08-06 Letter from FHWA to the Service requesting initiation of formal Section 7 consultation on the proposed Route 624 bridge replacement. This letter contained the March 7, 2006 biological assessment as an enclosure.

03-31-06 Conference call between the Service, VDGIF, and Dr. Bryan Watts to discuss the findings of the BA. During this conference call, it was determined that changes had been made to the BA, following Dr. Watts' last review.

04-10-06 Letter from the Service to FHWA confirming the initiation of formal Section 7 consultation. The Service noted that according to Dr. Bryan Watts, portions of the biological assessment were not reviewed by Dr. Watts prior to release, and that he may not agree with portions of the biological assessment.

04-12-06 Letter from the Service to Dr. Bryan Watts requesting a version of the Biological Assessment that he believed would be scientifically accurate. The Service also requested his recommendations for minimizing the impacts of this project on the bald eagle population in Cat Point Creek.

05-09-06 Electronic mail from Dr. Bryan Watts to the Service containing his original biological assessment and management recommendations, which included a

recommendation to install a substructure to maintain the current height for boat passage.

07-17-06 Electronic mail from the Service to FHWA transmitting the Biological Opinion, draft Terms and Conditions for review and comment.

07-21-06 Electronic mail from FHWA to the Service expressing engineering/legal constraints regarding various draft Terms and Conditions and requesting changes to the draft Terms and Conditions.

07-28-06 Letter from the Service to FHWA requesting additional information on engineering/legal constraints regarding bridge construction.

08-11-06 Electronic mail from FHWA to the Service responding to the Service's July 28, 2006 letter and requesting changes in the Biological Opinion, draft Terms and Conditions.

08-30-06 Second Draft Biological Opinion submitted to FHWA.

09-07-06 Electronic mail from FHWA responding to the 08-30-06 second Draft Biological Opinion. FHWA stated that the agency had no comments and requested finalization of the Biological Opinion.

Figure 1: Action area, project location, and bald eagle nest locations within the action area.

Figure 2: 2004-2006 mid-winter bald eagle observations in Cat Point Creek (Watts and Parsons Transportation Group Inc. of Virginia 2006).

Figure 3: Cat Point Creek bald eagle communal roosts [(including 750-foot and ¼ mile buffers) (Watts and Parsons Transportation Group Inc. of Virginia 2006)].

bcc: FWS, R5, ES, Hadley, MA (Mike Thabault)
FWS, R5, ES, Hadley, MA (Marty Miller)
FWS, R3, Rock Island, IL (Jody Millar)
FWS, R5, LE, Richmond, VA (Rick Perry)
VDGIF, Fredericksburg, VA (Jeff Cooper)
VDGIF, Richmond, VA (Amy Martin)
VDCR, DNH, Richmond, VA (René Hypes)
Center for Conservation Biology at the College of William and Mary (Bryan Watts)

(S:\Federal Activities\PERMITS\VDOT06\624BOFinal.rtf)
(WHester 9-12-06)

Jody Millar
National Bald Eagle Recovery Coordinator
USFWS
4469 48th Ave Ct
Rock Island, IL 61201