May 18, 2001

Colonel Allan B. Carroll
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510-1096

Attn: Cynthia Wood
Regulatory Branch

Re: Biological Opinion for Cresswell Community Pier, Project # 00-V0974, Fairfax County, Virginia

Dear Colonel Carroll:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the subject proposed community pier in Fairfax County, Virginia and its effects on the bald eagle, *Haliaeetus leucocephalus*, 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.). Your December 21, 2000 request for formal consultation was received on January 2, 2001.

The U.S. Army Corps of Engineers (Corps) proposes to issue a Department of the Army permit to Cresswell and Company, L.L.C. This biological opinion is based on information provided in the August 24, 2000 species notification, the December 21, 2000 request to initiate formal consultation, a site visit, electronic mail, telephone conversations, field investigations, and other sources of information. A complete administrative record of this consultation is on file in this office.

I. CONSULTATION HISTORY

See Appendix A.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The Corps proposes to issue a Department of the Army permit to Cresswell and Company, L.L.C. The applicant proposes to construct a 404-foot pier with 14 boat slips along Gunston Cove on Mason Neck in Fairfax County, Virginia. Diagrams of the proposed pier are enclosed (Figures 1-3). The pier will be for the exclusive use of the 12 single-family dwellings in a planned subdivision. Five of the 12 lots are waterfront, and the applicant expects that this community pier will be constructed in lieu of five private piers.

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 Mason Neck bald eagle concentration area and inland areas within 750 feet of the shoreline. The length of the action area is based on the impact of boat traffic on eagles. The width of the action area is based on the conclusions of a bald eagle management meeting on September 29, 2000 that involved the Service, the Virginia Department of Game and Inland Fisheries (VDGIF), and other eagle experts. One result of the meeting was the update of the Bald Eagle Protection Guideline for Virginia (USFWS & VDGIF 2000). A map showing the action area (Figure 4) is enclosed.

STATUS OF THE SPECIES RANGEWIDE

Species Description – The bald eagle is a large bird of prey with a wing span of 6½ feet. It is found primarily near the coasts, rivers, and lakes of North America. Although bald eagles are known for their white heads and tails, immature and juvenile birds are mainly brown. Bald eagles breed at four to five years of age, the same time they develop their white head and tail. Adult birds 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 five 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. There are two concentration areas on the James River – Powell Creek concentration area (between Powell and Wards Creeks) and Presquile concentration area (between the Benjamin Harrison Memorial Bridge and the upstream edge of Jones Neck Cutoff); one on the Rappahannock River – Rappahannock River concentration area (between Port Royal and Tappahannock); and two on the Potomac River – Mason Neck concentration area (between Accotink Bay and the upstream edge of Belmont Bay) and Caledon concentration area (between Chotank Creek and just west of Somerset Beach). Immature and non-mated eagles range widely. Northern pairs also migrate south during the winter when rivers and lakes freeze. These birds tend to congregate in both summer and winter concentration areas, where feeding opportunities are good and human disturbance is minimal. Although resident breeding eagles account for a portion of the birds found in these concentration areas, many come from outside the local area. Evidence suggests that birds from both southeastern and northern recovery populations converge on these Virginia sites. Protection and management of these concentration areas may be more important to the continued recovery of the bald eagle in Virginia and throughout the East Coast than any other habitat.

Life History/Populations Dynamics – Unless otherwise noted, the information in this section was taken from VDGIF (1994) and Watts *et al*. (1994).

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 (Chandler *et al*. 1995). Chandler *et al*. (1995) found that 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. In their study, eagles tended to perch within 164 feet of the shore. They recommended that shoreline trees greater than 7.87 inches 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 33 feet above the water and were well below the level of neighboring tree tops. Clark (1992) observed that, within the Powell Creek concentration area on the James River of Virginia, 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, and small mammals, as well as scavenging carrion. In the summer, fish are the primary component of the diet. Eagles in Virginia feed on shad, catfish, carp, menhaden, perch, and eels depending on their seasonal availability. In the fall and winter, eagles shift their foraging to waterfowl 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).

Watts and Whalen (1997) conducted boat and eagle observations from three pier locations within the Powell Creek eagle concentration area on the James River during the summer of 1997. Peak eagle foraging began at dawn and continued until 8:30 a.m. After 8:30 a.m., eagle foraging activity declined and remained fairly stable until 11:00 a.m., when the amount of foraging decreased rapidly and remained low for the rest of the day. Between 6:00 and 8:30 a.m., 55% of morning foraging was documented. By 9:30 a.m., 70% of foraging had occurred. By 10:00 a.m., 79% of foraging had occurred, and 95% of all morning foraging activities had occurred by 11:00 a.m.

During the late afternoon/early evening, bald eagles usually fly inland to roost for the night. Most summer eagle roosts in the Chesapeake Bay region were found in greater than 100-acre forest blocks and were further from human development than random sites (Buehler *et al*. 1991b). Ninety-five percent of the roosts were within 2,362 feet of water and 50% were at least

2,231 feet 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 food for eagles 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 fecundity. Since the nationwide ban on most persistent pesticides, bald eagle populations have experienced gradual recovery in both productivity and total numbers.

The "Southern" bald eagle was federally listed as endangered in 1967. The remaining bald eagle populations in the coterminous United States were listed as endangered or threatened in 1978 and the "Southern" designation was dropped. The Service divided bald eagles in the lower 48 states into five recovery regions based on geographic location. The five regions are the Chesapeake Bay, Pacific, Southeast, Northern, and Southwest. A recovery plan was prepared for each region by separate recovery teams. The Southeast, Northern, and Chesapeake Bay Recovery Regions are pertinent to this opinion. The Southeast bald eagle recovery region includes birds from Florida, Georgia, South Carolina, North Carolina, Kentucky, Tennessee, West Virginia west of the 80th meridian, Alabama, Mississippi, Arkansas, Louisiana, and Texas west to the 100th meridian. Twenty-four states are included in the Northern recovery region. The Chesapeake Bay recovery region encompasses Virginia, Delaware, Maryland, the eastern half of Pennsylvania, the pan-handle of West Virginia, and the southern two-thirds of New Jersey.

On August 11, 1995, all bald eagle populations in the lower 48 states (except those already listed as threatened) were reclassified from endangered to threatened due to increasing numbers and range expansion (50 CFR Part 17 36000-36010). In Virginia, the breeding population has steadily increased from an estimated low of approximately 32 pairs in the late 1960s to 315 nesting pairs in 2001. Habitat loss now poses a greater threat to the bald eagle since its preferred habitat is where most of the human population growth is occurring in the United States.

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; July 6, 1999). No further action has been taken, and the species is still listed as of the date of this

Biological Opinion.

Threats to the Species – Although the bald eagle has rebounded over the past 15 to 20 years, current patterns of habitat loss in the Chesapeake Bay region threaten to halt or even reverse 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, and transportation. Conversion of woodlands to agricultural fields and timber harvesting is also resulting in the loss of eagle habitat. As the human population along these shoreline areas continues to grow, more undisturbed wooded habitat used by bald eagles will be permanently altered. Between 1978 and 2020, the developed area of the Chesapeake Bay watershed is predicted to increase by 74% and 80% in Maryland and Virginia, respectively (Gray *et al*. 1988). 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. Between 1992 and 1995, the population in Virginia increased 1.5% each year and boat registration increased 7% during that time (J.R. Davy, Virginia Department of Conservation and Recreation, pers. comm. 1996).

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 survive and 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.

Chronic human activity may result in disuse of areas by eagles (USFWS 1989). 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 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 now be unsuitable for eagle use because of the presence of development within 1,640 feet 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 meters [328 feet] of the water." Buehler *et al*. (1991b) seldom observed eagles on the northern Chesapeake Bay within 1,640 feet 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, on average, when humans get within 577 feet (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).

In addition to human activity, 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, 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 vegetation 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 328 feet wide. In addition, the buffer should have a minimum of one tree per 820 feet of shoreline that is at least 15.7 inches in diameter at breast height, is accessible to eagles, and contains suitable perching limbs. They also recommended conserving trees greater than or equal to 23.6 inches in diameter at breast height.

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-site will allow closer presence of humans and provide perching and roosting trees (Stalmaster and Newman 1978). Stalmaster (1980) recommended restricting land activities 820 feet from eagles perched in shoreline trees to protect 99% of the birds. He suggested that boundaries could be shortened to 246 to 328 feet in width if at least 164 feet of this zone contains dense, shielding vegetation.

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 that which 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).

Clark (1992) found that within the Powell Creek eagle concentration area, 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.

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 656 to 2,952 feet of a single stationary experimental boat, with an average avoidance distance of 1,300 feet. During this time, eagles spent less time foraging and made fewer foraging attempts. McGarigal *et al*. (1991) recommend a 1,312 to 2,624 foot wide buffer around high-use foraging areas. Knight and Knight (1984) studied wintering eagles in Washington and found that a 1,148 foot 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. A buffer of at least 1,476 feet would be required to protect 99% of eagles feeding on the ground from a single canoe.

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 575 feet. M.A. Byrd (College of William and Mary's Center for Conservation Biology, pers. comm. 1989) has observed that when eagles are flushed by recreational boats from perch sites along the James River, they usually fly inland and cease foraging for at least several hours. 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 656 feet of the shoreline. When the boat was within 328 feet of the shoreline, nearly 80% of the birds flushed. During shoreline surveys, they found that nearly 50% of all boats observed were within 656 feet of the shoreline and more than 35% were within 328 feet. 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 656 feet of the shoreline has a significant negative effect on shoreline use by bald eagles.

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; 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 too 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). Disturbance from industrial boats' wakes striking the shore caused flushing of perched eagles. 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).

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 meters, 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 human 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 174 feet).

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 power poles that have a high risk of eagle electrocution.

ENVIRONMENTAL BASELINE

Status of the Species Within the Action Area – Bald eagles are found in the action area year-round with little to no seasonality. Eagles using this area feed and perch along the shoreline during the day and roost in adjacent large, wooded tracts at night. The concentration area is used by eagles from the Northern, Southeast, and Chesapeake Bay recovery regions. According to 1987-1990 data gathered by the staff of the Mason Neck National Wildlife Refuge, the Mason Neck bald eagle concentration area supported 74 eagles on February 9, 1988 though typical annual highs were closer to 40 eagles. Occasionally, over 100 eagles are observed in a single winter day, probably when frozen rivers to the north cause eagles to fly south to the flowing Potomac (Joe Witt, Mason Neck National Wildlife Refuge, pers. comm. 2001).

Table 1 presents the average number of eagles observed in the Mason Neck area between 1992 and 1997. The shoreline segments used in this table are shown in Figure 5. Eagles were most common from September to January, though they were fairly common every month of the year. The actual numbers of eagles that occur along the shoreline segments throughout the year may be higher than reported because the surveys were conducted between 10:00 a.m. and 2:00 p.m., and most bald eagles forage early in the morning. The smaller number of eagles in late spring and summer may be due to the level of boat traffic in the action area.

In general, the areas with the greatest amount of eagle habitat are located in segments 9 through 18 (Kanes Creek to the westernmost edge of Hallowing Point Estates), segment 22 (the shoreline approximately 0.5 miles north of Hallowing Point Estates to just south of Pohick Bay Regional Park), and segments 24 through 27 (Accotink and Pohick Bays) (Figure 5). Portions of the shoreline least suitable for eagles are segments 19 through 21, along the highly developed Hallowing Point Estates, and segment 23, Pohick Bay Regional Park marina. The proposed pier would be located in segment 21.

There are no active bald eagle nests within 1,320 feet of the site of the proposed pier. Only nest FF-0002, located on Fort Belvoir adjacent to Accotink Bay, is within 750 of the shoreline within

the action area.

Factors Affecting Species Habitat Within the Action Area – Currently, eagles in the action area are adversely impacted by shoreline clearing/development and human use. Clearing of vegetation and the presence of structures and subsequent human use has caused portions of the concentration area to be unsuitable for eagles. The additional boat traffic caused by this pier will result in continued loss of perching, roosting, and foraging habitat. Because recreational boat traffic is unpredictable and tends to come closer to the shore, it is particularly disruptive to eagles (Watts and Whalen 1997). Boat traffic, especially recreational boat traffic, results in the functional loss of habitat.

The shorelines of Accotink and Pohick Bays consist mainly of gentle slopes, relatively flat areas or areas of extensive wetland vegetation, with individual large, mature eagle perch trees along the perimeter. The width of the mouth of Gunston Cove is approximately one mile, narrowing to approximately 0.5 miles at the mouths of Pohick and Accotink Bays. The shoreline of the Mason Neck peninsula has steep slopes ranging from 35 to 60 feet high. The majority of the peninsula has a designated conservation land use (e.g., park, wildlife refuge). With the exception of those areas on the peninsula with a considerable amount of residential development, near Gunston Manor and Hallowing Point Estates, the shoreline is heavily wooded with many tall perch trees.

During the bald eagle shoreline surveys conducted by Mason Neck National Wildlife Refuge, the following observations were noted by the Refuge Manager from 1988 to 1997. (1) There appears to be a consistent negative relationship between the number of eagles foraging and the volume of boat traffic. When eagles were not observed in a given shoreline segment, four to five fishing boats were using the area. Few or no eagles were observed if there were six or more fishing boats in the survey area. (2) The majority of boats staying close to the shoreline around the Mason Neck peninsula were fishing boats. Paddle boats and small sailboats also appear to be a source of disturbance to eagles because these boats tend to concentrate in shallow water where the eagles forage. (3) The effect of fishing boats on eagles appears to be the greatest source of disturbance because these boats repeatedly enter and exit the small coves, sometimes as often as twice an hour.

Only one public boat ramp, located at Pohick Bay Regional Park, currently provides boat access directly to Gunston Cove and Accotink and Pohick Bays. Pohick Bay Regional Park reported approximately 250 boat launches per weekend day for the six-week period of June 1 through mid-July, 1994 (CDM Federal Program 1997).

During the summer of 1996 a boat use study of the general action area was conducted for a proposed marina at Fort Belvoir, to the northwest of the Cresswell project site (Dunk *et al.* 1997). The results of that study are provided below.

Ramp Interviews/Questionnaires - Users of each of six public boat ramps between Quantico Marine Corps Base and Washington, D.C. were interviewed during a single six-hour period on a

summer weekend day; 120 usable interviews were completed. One hundred fifty questionnaires were sent to boaters who access the Potomac River from Leesylvania State Park boat ramp, 54 responses were received (36% response rate). Boaters who used Dogue Creek marina were sent questionnaires, 64 were returned (response rate of 43%). Questionnaires were provided to three local marinas, 24 individual responses were returned.

The traditional "runabout" (typically 16 to 18 feet long and 100 to 200 hp) was used by 40% of survey respondents. Fishing boats were used by 23%, and together with runabouts, comprised nearly 2/3 of all boat types used. Cabin cruisers and sailboats were used by 13% and 12%, respectively. Personal watercraft were used by 5% of respondents. Many boaters reported that they used personal watercraft in addition to a runabout or other type of boat. Personal watercraft are also a popular choice for rentals and may be used by several different renters on the same day. A small number of larger and more powerful boats, referred to as "speedboats" (20 to 25 feet long and several had power ratings over 250 hp) were used by 5% of respondents. Few respondents used boats in the "kayak/canoe" category (<1%) or houseboats (<1%).

A majority of boaters reported that they used their boats from April through October. More than 85% reported boating from May through September. Very few respondents reported boating between November and March. The top months for boating were reported as June, July, and August by >2/3 of respondents. However, both May and September were indicated as top months by ~25% of respondents. No more than 8% checked any month between October and April. Regarding amount of boat use in the action area, 15% listed Pohick Bay, 10% Gunston Cove, 6% Belmont Bay, and 2% Accotink Bay as one of their most common destinations. Taken together, approximately 1/4 of boaters surveyed stated that they use some portion of the action area most often. The largest percentage of boaters (51%) reported that they hardly ever or never used Pohick or Accotink Bays. The other half of the respondents indicated use of these Bays sometimes (25%), frequently (12%), and very frequently (11%). 51% of boaters stated that they went into one of the Bays within the last year; 7% within the past 1-3 months, and 39% within the last week to 1 month.

Boat Ramp Exit Interviews - Pleasure boating (53%) and fishing (32%) were the two most pursued activities by ramp users; water-skiing was 17% and personal watercraft was 12%. Of the ramp users, 67% were on the water for a half day, 30% for a full day, and 3% for more than 1 day. The most common destination for ramp users on the day of the interview was the mainstem Potomac River (28%), Gunston Cove (13%), Pohick Bay (11%), Belmont Bay (2%), and Accotink Bay (2%). Although the three Bays were the primary destination for only a small percentage of boaters, the proportion of boaters who were in those Bays for at least part of their trip is somewhat higher. This is particularly true for Pohick Bay, which 27% of respondents used. Accotink and Belmont Bays were each used by 6% of boaters. Overall, 31% of boaters used one or more of the three Bays.

While most boaters who used the three Bays did spend some time there rather than just passing through, most spent the majority of their trip in other areas; 23% said they passed through, 51%

said they spent about an hour, and 26% said they spent most of the trip in one of the three Bays. Seventy-one percent of boaters estimated that they had been within 100 yards of the shoreline and 26% said they had been within 0.5 miles from shore while in one or more of the Bays. As was the case regarding the boaters' primary activities for the trip, the primary activity within the bays was most often pleasure boating (30%). Fishing (24%) and water-skiing (22%) by bay users were relatively close to those recorded for overall primary activities. However, a large difference was apparent in regards to personal watercraft use in that only 12% of the respondents mentioned personal watercraft use as a primary activity on the day of the interview, while 27% of those who used the Bays indicated personal watercraft use was their primary activity while there. This suggests that personal watercraft use in this area is concentrated in the three Bays. Non-powered boating activities were minor in the Bays.

Boat Counts - The authors of the study concluded "that the methods used for conducting boat counts during the 1996 study had severe limitations and as a consequence the data lack sufficient reliability to make strong inferences about the results." The overall average number of boats counted on weekends in Gunston Cove was more than five times the average number counted on weekdays and was more than ten times greater than the weekday average in Belmont Bay. The data indicated that the amount of use increases throughout the day on weekends and peaks in mid- or late afternoon. The early afternoon peak on Belmont Bay represents a more than nine-fold increase over morning traffic. Gunston Cove experiences perhaps a tripling or quadrupling of use between the morning and the afternoon peak. Gunston Cove and Pohick Bay receive the most use on any day. Accotink Bay had the lowest average number of boats per half hour for all days.

The most common type of boats in Gunston Cove and Belmont Bay on weekends were pleasure boats less than 20 feet long. These boats were also most common on weekdays in Belmont Bay. However, on weekdays in Gunston Cove, personal watercraft were the most common followed by pleasure boats less than 20 feet long. Personal watercraft were also a close second behind small pleasure boats on weekends in Gunston Cove. In Belmont Bay, personal watercraft were not observed at all in the morning period and very rarely seen before 2:00 p.m. Personal watercraft were also scarce during the morning period in any region of Gunston Cove. However, they were far more prevalent starting with the 10:00 a.m. counts, especially on weekends. Ski boats were most often observed in Pohick Bay at any time and in Gunston Cove in the late afternoon. In Belmont Bay, ski boats were found to be rarely used before noon; however, in the afternoon this type of boat became a significant part of the boat traffic in that Bay. At most times, averages for fishing boats in Gunston Cove were consistently lower than the previously mentioned boat types. The highest averages occurred during the morning and pre-noon periods in Pohick Bay. In Belmont Bay, fishing boats were observed most in the morning. Sailboats, sailboards/wind surfers, and canoes, kayaks, or rowboats were typically minor components of the boat traffic observed. These boat types were very rarely observed, if at all, on weekdays.

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 – Since eagles are present year-round in the action area, construction of the pier is likely to adversely affect eagles. Construction will involve barges in the water and land-based equipment such as pile drivers and trucks. The barge activity will likely flush eagles from perching areas and reduce feeding time. The visual and auditory disturbance during construction will also likely prevent use of the shoreline and the river around the construction site.

The proposed action is not anticipated to have any effect on active eagle nests.

Interrelated and Interdependent Actions – An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. No activities that are interrelated to or interdependent with the proposed action are known at this time.

Indirect Effects – Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect impacts to eagles will result from boats that are launched from the proposed ramp. The type of boats expected to be launched from the proposed ramp include fishing boats (*e.g.*, jon and bass boats), sport boats (including water skiers), canoes, kayaks, and Personal watercrafts. At this time, it is unknown how many of each type of boat will be moored at the pier.

Dunk *et al.* (1997) found that pleasure boats accounted for 53% of all boat activity around the action area. Fishing boats accounted for only 32%. The majority (51.2%) of boat/eagle interactions Watts and Whalen (1997) observed involved fishing boats. Fishing boats frequented nearshore areas throughout the day and comprised nearly 75% of all boats observed outside of the channel. This suggests that a single fishing boat may disturb eagles along a considerable amount of shoreline. Watts and Whalen (1997) found that fishing boats were located along the shoreline in such as way that several boats could disturb long stretches of shoreline. They 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. In addition, fishing boats are most likely to be present during early morning hours when eagle foraging is at its peak. Pleasure boats are more likely to remain farther from the shore, thus impacting the eagles less than fishing boats.

Fishing boats typically are most active in the mornings and spread out along the shoreline, both characteristics that greatly impact eagles. While pleasure boats do impact eagles, this type of boat usually remains in the channel and is rarely launched early in the morning. Thus, because of their travel patterns and activities, pleasure boats usually do not impact eagles during morning foraging, but are likely to adversely impact eagles during daytime perching along the shoreline.

Boating season for boats originating from the proposed pier is anticipated to be May through

October. In late spring and summer (May through August), when boat traffic is expected to be at its highest levels, the number of bald eagles in the action area will be at their lowest densities (Table 1). It is expected that the proposed pier will have the greatest effect on eagles utilizing shoreline segments 20-21 (Figure 7). Most boats leaving and entering the pier (in segment 21) would transit these segments within at least 1,000 feet of the shoreline. If those two segments are divided by the total action area, consisting of 28 segments, the functional habitat loss anticipated from increased boat traffic is equal to approximately 7% of the action area. Segment 20 is heavily used by eagles; it is one of only eight segments that average more than one eagle seen per survey during the Refuge surveys. Approximately 7% of the eagles in the concentration area were seen in Segments 20 and 21 (Table 1). Because eagles have been documented in the action area year-round, it is likely that the majority, if not all, of the bald eagles foraging and perching in segments 20-21 on any given day of the year will be disturbed by boating activity. Even a small increase in boat frequency on weekdays may represent a larger relative effect on the eagles, as it may leave no time for eagles to recuperate from the increased disturbance during the weekends.

Pohick Bay Regional Park Marina reported 250 launches per day on a summer weekend/holiday. Operation of the proposed community pier is not anticipated to greatly increase the number of boats in the action area. Assuming that half of the homeowners will use the proposed community pier on any given day of a summer weekend or holiday, it is estimated that six launches per day will occur. This is a 2.4% increase in boat traffic. However, boaters launch from other ramps, marinas, and piers and subsequently utilize the Gunston Cove area; this boat traffic has not been quantified. If data on this additional boat traffic were available, the result in the actual increase in boat traffic in the action area due to the proposed community pier would be less than a 2.4% increase.

An approximate 2% increase in recreational boating activity in the Mason Neck eagle concentration area on a summer weekend/holiday day due to the proposed community pier may slightly increase disturbance to eagles utilizing this concentration area. The proposed pier will result in increased boat traffic within the eagle concentration area, which may disrupt perching and foraging eagles. Watts and Whalen (1997) suggested that the presence of boats on the James River within 656 feet of the shoreline had a significant negative effect on shoreline use by bald eagles. Once a boat is stationary, eagles will avoid the area around the boat, resulting in additional disturbance. When boats leave from and return to the proposed pier, there is a high probability that individual eagles will be flushed multiple times, forcing them to fly inland for prolonged periods. This results in increased time eagles will spend scanning for boats while trying to forage, yielding a decrease in food intake and/or inability to forage after being forced inland from numerous disruptions. Reduced foraging by the nesting eagles within the action area could seriously impact the survival of their young. In addition, Fraser (1983) stated that subadult bald eagles make up the future breeding populations and food shortages and major habitat disturbances are likely to affect them before breeding birds are affected. Stalmaster and Kaiser (1998) found that “although the effects of activity are cumulative, events early in the daily sequence cause most disturbance . . . recreational use should be restricted in the morning to increase feeding activity . . . .” They further stated that “. . . many recreationists were either

unaware of eagles responding to their presence or based their beliefs on their observations of unusually tolerant birds. Many intolerant eagles had already left the river or altered their behavior during the earliest events of the day, before most visitors were on the river. . . ." Stalmaster and Kaiser (1998) recommended that ". . . recreational use should be prohibited during the first five hours of daylight . . ." to allow bald eagles to forage without disturbance from humans.

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.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the action area. 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.

Construction of 12 homes, five on the shoreline, will impact eagles. Any construction within 750 feet of the shoreline within an eagle concentration area requires consultation (USFWS & VDGIF 2000). Actions within 750 feet of the shoreline with a federal nexus are subject to section 7 of the ESA. Private actions (non-federal) are subject to section 10 of the ESA.

At the present time, the Mason Neck peninsula does not have access to sewer. Land development is restricted to lots capable of supporting septic systems. While the lack of access to sewer will slow development in the short term, developmental pressures from the greater Washington, D.C. area will probably result in sewer access at some point in the future. Greater development in the area will impact the eagle concentration area by removing perching habitat and by the resulting increase in human use and boat traffic, which results in functional loss of foraging habitat.

CONCLUSION

Boat traffic results in the functional loss of habitat. Based on the results of Watts and Whalen (1997), fishing boats operating in the morning are most likely to adversely impact bald eagles because fishing boats are most likely to travel along shoreline areas where the birds are located and because the morning is the eagles' peak foraging period. While sport boats are anticipated to impact eagles as well, the extent of sport boat impacts may be lessened by these boats' tendency to stay further from the shoreline, and the tendency to be on the river more frequently in the afternoon, after the peak of eagle foraging activity. The proposed action will result in an increase in all forms of recreational boat use in the concentration area and will result in increased

disturbance to bald eagles in the northern section of the Mason Neck concentration area.

The impacts of the proposed pier, in conjunction with the cumulative effects of existing and reasonably foreseeable activities within and adjacent to the Mason Neck eagle concentration area, will reduce, though not appreciably, bald eagle habitat within the concentration area. Concurrent losses in habitat due to shoreline clearing and development are likely.

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 Service's biological opinion that the construction of this community pier within the Mason Neck eagle concentration area, as proposed, is not likely to jeopardize the continued existence of the Chesapeake Bay, Southern, or Northern bald eagle recovery regions. No critical habitat has been designated for this species, therefore, none will be affected.

III. INCIDENTAL TAKE STATEMENT

Sections 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 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 taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be undertaken by the Corps so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in action 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Corps must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement.

AMOUNT OR EXTENT OF TAKE

Determining the exact amount of take of the bald eagle is difficult because: (1) there are

insufficient data on the specific thresholds for disturbance that eventually causes eagles to abandon an area, (2) there is great variability in the numbers of eagles and the individual eagles present in the action area throughout the year, and (3) there are insufficient data on the current and projected destinations and numbers of boaters within the action area to predict the precise location and exact increase in disturbances which will occur.

The Service anticipates that incidental take of the bald eagle will be difficult to detect because 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. Eagle habitat used for foraging, perching, and roosting throughout the concentration area along the shoreline of the Potomac River, in the water, and 750 feet landward will be affected by human activities. Boats will flush foraging or perched eagles as boats travel within the concentration area. Every time a boat stops, the area up to 2,952 feet around it will be avoided by eagles. When the boat moves again, more eagles will be flushed. Because the use of boats is unpredictable and eagle numbers may vary on a given shoreline segment, a total acreage of disturbance cannot be quantified. A few boats moving along the shoreline could functionally eliminate a significant portion of the shoreline and riverine habitat from eagle use for an entire day.

Incidental take is expected to be in the form of harm and harassment. The Service anticipates that on an average weekend day during May through October, all eagles will be adversely affected within shoreline segments 20 and 21. It is estimated that a smaller percentage of eagles within segment 22 will be adversely affected. Although an exact number cannot be calculated, it is anticipated that 25% to 75% of the eagles within segment 22 could be affected.

The Service will not refer the incidental take of the bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that the construction of a community pier, as proposed, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

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

- Construct the pier to minimize negative effects to eagles.

- Minimize harassment of eagles by boat traffic. Take measures to inform boat users of the potential for their activities on the Potomac River and its tributaries to disturb foraging, perching, and roosting bald eagles.

- Minimize shoreline lighting to avoid harassment/harm of bald eagles.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the ESA, the Corps 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. Construct the pier between April 1 and August 31.

2. Clearing of vegetation, dead or alive, associated with the construction of the pier must be the minimum necessary to install the pier.

3. Barges used during construction must remain in the main channel as much as possible and minimize the length of shoreline that they come close to. Barges should enter the construction area from the nearest point of the main channel rather than hugging the shoreline.

4. The permittee is required to notify the Service before starting construction and upon completion of the pier.

5. Reduce the number of slips to 12 (one per house).

6. If any of The Reserve subdivision waterfront lot owners propose to develop additional boat mooring/docking facilities, such activities will be reviewed by the Corps under its individual permit review process in consultation with the Service. The purpose of the proposed action states “This facility will be constructed in lieu of construction of several private piers by homeowners on their own waterfront lots.”

7. Provide a copy of this biological opinion to Cresswell and Company, L.L.C. to inform them about the impacts of boat activity on bald eagles. Require Cresswell and Company, L.L.C. to distribute the biological opinion to all 12 landowners.

8. Any construction within 750 feet of the shoreline within an eagle concentration area should be coordinated with this office to ensure activities do not adversely affect bald eagles. Furthermore, the bald eagle is protected under the Virginia Endangered Species Act, and the developer should contact the following agency for more information:

Virginia Department of Game and Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, Virginia 23230
(804) 367-8998

9. Cresswell and Company, L.L.C. must develop an exterior lighting plan for the pier and other areas of the subdivision, submit the proposed plan to the Service for approval, and implement the approved plan to ensure that all lighting is directed downward. This and any additional information to be sent to Service should be sent to the following address:

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

10. A large, weatherproof sign shall be placed and maintained adjacent to the pier entrance to inform users of the large numbers of bald eagles utilizing the shoreline adjacent to the pier. The sign shall describe the use of the area by eagles, identify the time of day of peak foraging, and explain why boaters should avoid nearshore activities. The sign shall also provide educational information on the natural history of the bald eagle and the significance of the Mason Neck bald eagle concentration area. The proposed size, language, and layout of the sign shall be submitted to and approved by the Service. The sign shall be installed prior to operation of pier and photographic evidence thereof must be submitted to the Service.

11. Care must be taken in handling any dead specimens of 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 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.

The Service believes that an unquantifiable but small number of eagles may be harmed and harassed every year 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 represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures. The Corps must immediately provide an explanation of the causes of the take, and review with Service the need for possible modification of the reasonable and prudent measures and the terms and conditions.

IV. 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 the Corps in fulfilling our mutual responsibilities under the ESA. If you have any questions, please contact Mr. Eric Davis of this office at (804) 693-6694, extension 104.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

LITERATURE CITED

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.

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.

CDM Federal Programs Corporation. 1997 (July). Draft Environmental Assessment, U.S. Army Garrison Fort Belvoir, Tompkins Basin Recreation Area (TBRA) complex, Fort Belvoir, Virginia.

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.

Dunk, W.M., J.J. Vogel, and J.P. Titre. 1997. Boating use patterns on the Potomac River. U.S. Army Corps of Engineers, Waterways Experiment Station. Prepared for U.S. Army Garrison Fort Belvoir, Virginia.

Fraser, J.D. 1983. The impact of human activities on bald eagle populations - a review. Pages 68-84 *in* J.M. Gerrard and T.N. Ingram, *ed*s. Bald eagle in Canada Proceedings of Bald Eagle Days.

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.

Gray, R.J., J.C. Breeden, J.B. Edwards, M.P. Erkiletian, J.P. Blase Cooke, O.J. Lighthizer, M.J. Forrester, Jr., I. Hand, J.D. Himes, A.R. McNeal, C.S. Spooner, and W.T. Murphy, Jr. 1988. Population growth, and development in the Chesapeake Bay watershed to the year 2020. U.S. Environmental Protection Agency, Chesapeake Bay Liaison Office, Annapolis, MD.

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 guild 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.

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.

U.S. Fish and Wildlife Service. 1989. Final Environmental Assessment. Proposal to protect endangered bald eagle habitat Prince George County, Virginia. Newton Corner, MA.

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

U.S. Fish and Wildlife Service, Virginia Field Office and Virginia Department of Game and Inland Fisheries. 2000. Bald eagle protection guidelines for Virginia. Gloucester and Richmond, VA. 6 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. 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.

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.

(EDavis: 5/10/01)
(filename:C:\Program Files\Adobe\Acrobat 4.0\Acrobat\plug_ins\OpenAll\Transform\temp\bocresswell.wpd)

bcc: Program Supervisor-ES, South, Region 5 (Jeff Underwood)
Endangered Species Coordinator, Region 5 (Paul Nickerson)
Endangered Species Biologist, CBFO (Mary Ratnaswamy)
USFWS Law Enforcement, Richmond (Rick Perry)
USFWS Law Enforcement, Fredericksburg (Al Hundley)
USFWS eagle coordinator (Jody Millar)
USFWS, Mason Neck NWR (Joe Witt)
VDGIF, Richmond (Tom Wilcox)
VDGIF, Fredericksburg (Jeff Cooper)
VDCR, DNH, Richmond (Rene Hypes)
VMRC, Newport News (Ben Stagg)
Center for Conservation Biology at the College of William and Mary (Bryan Watts)

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

Ben Stagg
Virginia Marine Resources Commission
2600 Washington Avenue
P.O. Box 756
Newport News, Virginia 23607-0756

APPENDIX A– CONSULTATION HISTORY

08-24-00	The Corps faxes a species notification to the Service.
09-22-00	The Service informs the Corps that the project is located in the Mason Neck eagle concentration area and that the Service will coordinate with the Virginia Department of Game and Inland Fisheries (VDGIF) the following week.
09-29-00	The Service and VDGIF meet and discuss this proposed action as well as other issues.
10-13-00	The Service recommends the Corps initiate formal consultation.
12-21-01	The Corps requests formal consultation.
01-02-01	The Service receives the Corps' request to initiate formal consultation.
01-30-01	The Service acknowledges that the Corps' package is complete and establishes the 135-day deadline of May 17, 2001.
04-10-01	The Service conducts a site visit.
05-16-01	The Service provides the Corps a draft opinion.

Table 1. Mason Neck/Potomac River Bald Eagle Shoreline Use Area Shoreline Count Summary, April 23, 1992 - August 12, 1997 (Conducted by Mason Neck National Wildlife Refuge).

Shoreline[1] Segment	Average Number of Bald Eagles[2] Observed (Total # Eagles/Total # Surveys)												
	Jan (3)[3]	Feb (1)	Mar (4)	Apr (6)	May (7)	Jun (9)	Jul (10)	Aug (9)	Sep (8)	Oct (8)	Nov (6)	Dec (4)	Total[4]
1	0.67	0	0	0.33	0	0.22	0.20	0.11	0.88	0.25	0.17	0.75	0.293
2	1.00	0	0	0	0.14	0.40	0	0.33	0.50	0.50	0.33	0.75	0.316
3	0.67	0	0	0	0.14	0.22	0.10	0	0.13	0	0.17	0.50	0.133
4	0	0	0.25	0	0	0	0	0.11	0.13	0.38	0.33	0.25	0.120
5	0.33	0	0	0	0	0.11	0.20	0.22	0.25	0.38	0.33	0	0.173
6	0	1.00	0.50	0	0	0.22	0.20	0	0.25	0.13	0.83	1.50	0.280
7	0	0	0.50	0	0	0.22	0.30	0.11	0.25	0	0	0	0.133
8	0	0	1.00	0	0.43	1.11	0.60	0.11	0.38	0.25	0.33	0.75	0.453
9	0.67	1.00	1.25	0.67	1.14	1.11	1.40	0.44	1.38	0.75	0.33	1.00	0.947
10	1.33	0	0.75	2.00	2.29	3.00	1.90	0.56	2.50	2.25	0.50	1.50	1.77
11	1.33	1.00	1.00	1.33	1.14	1.33	0.90	0.33	1.63	1.50	1.33	0.75	1.13
12	1.00	0	0.75	0	0.43	0.77	0.90	1.11	0.50	0.88	0.50	1.25	0.72
13	2.33	0	1.50	0.17	0.14	0.56	1.20	0.67	2.00	1.38	1.33	1.00	1.03
14	1.33	4.00	0	1.17	0.86	0.67	1.70	2.33	1.88	0.88	1.67	0.75	1.33
15	3.33	0	2.5	0.50	1.14	1.67	1.40	2.56	3.63	2.00	1.83	3.75	2.05
16	1.33	0	2.5	1.50	3.00	3.67	2.70	5.89	3.00	3.88	3.17	2.25	3.20
17	1.00	0	0.75	0.50	1.43	1.00	0.40	0.56	1.13	1.38	1.33	1.00	0.92
18	1.00	2.00	0.25	0.67	0.29	0.44	0	0.56	0.75	0.25	0.50	0.25	0.44
19	0.33	0	0	0	0	0	0	0	0.13	0	0.33	0.25	0.067
20	0.67	0	0.50	0.83	0.29	0	0.10	0	0.13	0.63	1.33	2.25	0.467
21	2.33	0	1.00	0.17	0	0.22	0.90	0.78	0.75	1.75	3.50	1.50	1.027
22	2.33	1.00	1.00	0.50	0.57	0.67	0.30	0.89	1.63	1.00	1.67	0.50	0.920
23	0	1.00	0	0	0	0.44	0.10	0.56	0.13	1.25	1.33	2.00	0.507
24	1.33	4.00	1.25	1.00	1.14	0.44	0.20	1.00	1.75	0.38	1.67	3.75	1.120
25	1.67	1.00	0.50	0.33	0.29	0.78	0.70	0.56	1.13	0.75	0.67	2.25	0.787

Shoreline[1] Segment	Average Number of Bald Eagles[2] Observed (Total # Eagles/Total # Surveys)												
	Jan (3)[3]	Feb (1)	Mar (4)	Apr (6)	May (7)	Jun (9)	Jul (10)	Aug (9)	Sep (8)	Oct (8)	Nov (6)	Dec (4)	Total[4]
26	3.00	0	0.50	0.50	1.00	0.67	0.50	0.78	0.63	0.38	1.00	2.00	0.813
27	0	0	0	0.50	0	0.33	0	0.11	0.25	0.63	0.83	1.50	0.333
28	0	0	0	0	0	0	0	0.22	0.13	0	0.67	0.25	0.107
Total[5]	1.12	0.57	0.65	0.45	0.57	0.73	0.60	0.75	0.99	0.85	1.00	1.22	

[1]See Figure 7 for location of shoreline segment.
[2]Adult and juvenile bald eagles combined.
[3]Number in parentheses is number of surveys conducted during that month.
[4]Total number of eagles/total number of surveys for that particular shoreline segment.
[5]Total number of eagles/total number of surveys for that particular month.