

Colonel Andrew M. Perkins, Jr.
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510-1096

Attn: Gerry Tracy
Regulatory Branch

Re: Habitats, L.L.C., Permit Application

94-1418-30, Northampton County, Virginia

Dear Colonel Perkins:

The U.S. Fish and Wildlife Service has reviewed the Habitats, L.L.C. Department of the Army permit application 94-1418-30 to construct riprap, groins, and spurs along the shoreline of the Chesapeake Bay in Northampton County, Virginia. Your January 20, 1995 request for formal consultation was received in this office on January 27, 1995. On May 5, 1995, your agency agreed to extend the formal consultation period to August 10, 1995. This document represents the Service's biological opinion on the effects of that action on the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*), Federally listed threatened, in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). A complete administrative record of this consultation is on file in this office. This letter also provides the separate comments of the Service and the Department of the Interior pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), which are included following the biological opinion.

I. CONSULTATION HISTORY

Consultation history is provided in Appendix A.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

Habitats, L.L.C., has applied for a Federal permit to construct shoreline stabilization structures on the Chesapeake Bay in Northampton County, Virginia (Figure 1). Originally, the applicant proposed to construct 1,750 linear feet of riprap and five groins. However, after several meetings and discussions among the Service; U.S. Army Corps of Engineers; Scott Hardaway, Virginia Institute of Marine Science; and the applicant, the project was revised to minimize impacts to the shoreline and northeastern beach tiger beetles, protect waterfront lots (seven 100-foot-wide lots north of Costin Pond) and the integrity of the stabilization structures, and prevent the breaching of Costin Pond. The 1,750 linear feet of riprap will be constructed in two sections (1,100 feet in Phase I and 650 feet in Phase II) (Figure 2). The applicant has stated that 1,500 square feet of vegetated wetlands and 1,500 square feet of intertidal substrate will be

covered by the riprap structure. The toe of the riprap structure will be buried approximately three feet and its placement will range from 10 feet landward of mean high water (MHW) to five feet channelward of MHW. The riprap will sit in or be buried in an excavated trench. The riprap and backfill (50% upland, 50% sand) will vary from 1 - 4 feet in height on a 2:1 slope and it will cover approximately 11,775 square feet. An indeterminate (and constantly changing) square foot ratio of intertidal and upland beach will be filled. It is indeterminate because MHW has not been surveyed in, there are seasonally higher high tides versus seasonally lower high tides, and constant erosion/deposition forces are changing the beach profile and beach topography. The applicant stated that work on the riprap will be done landward of the riprap's location. Some trees will be cleared from the shoreline for construction and permanent access to the shoreline structures.

The applicant also proposes to construct five 75-foot-long stone groins (8-foot wide base), one at Phase II and four (150 - 200 feet apart) at Phase I, covering 2,000 square feet of intertidal substrate (Figure 2). The groins will be low profile (E. Grimes, Coastal Resource Management, pers. comm. 1995). A low-profile groin has a maximum offshore height equal to the mean low water (MLW) elevation. The top of the groin should rise shoreward with a slope of 10:1 or flatter until it reaches an elevation of three feet above MLW elevation; this elevation should be maintained landward toward the bank. At both ends of the riprap in Phases I and II there will be 100-foot long stone spurs (Figure 2). In Phase II, the groin is located 325 feet from the spurs. The spurs will be constructed at a 45 degree angle with a gentle curve. The spurs will have a lower 30-foot section along the shoreline (2.5 feet in height, which is approximately MHW) and a higher 70-foot long section in the waterway (5 feet in height) (Figure 3). This would allow sand transport along the existing (above MHW) beach. The spurs will be approximately 12 feet wide at the base and 6 feet wide at the top. The two spurs closest to Costin Pond will be built within 18 months of the start of construction. The two spurs at the northernmost and southernmost ends of the project may or may not be built; if they are not constructed, the riprap will be tied into the upland at these points. The spurs will be buried or sit in an excavated trench along the shoreline and into the intertidal zone. The applicant has stated that the stone will be barged into Cape Charles and trucked to the site. Phase I will be constructed first.

The action area for this biological opinion has been determined by the Service to be the entire shoreline between Old Plantation and Elliotts Creeks (approximately 4,900 linear feet) from 70 feet channelward of MLW to the vegetation line landward of the beach. Because there is an extensive amount of sand offshore of the project area (in the form of sand bars parallel to the shoreline) and the shoreline of the entire action area is not being hardened, the proposed shoreline stabilization project is not likely to impact sand transport to the north or south of the project site to any measurable degree (S. Hardaway, pers. comm. 1995). Therefore, this project, as proposed, is not likely to impact beaches to the north of Old Plantation Creek or south of Elliotts Creek.

RANGEWIDE STATUS OF THE NORTHEASTERN BEACH TIGER BEETLE

The northeastern beach tiger beetle is a beach-dwelling insect measuring 0.5 to 0.6 inches in length. It has white to light-tan wing covers, often with several fine grayish-green lines, and a bronze-green head and thorax (Knisley 1991, U.S. Fish and Wildlife Service 1993, U.S. Fish and Wildlife Service 1994). Adult

tiger beetles are active, diurnal surface predators. They forage along the water's edge on small amphipods, flies, and other beach arthropods or scavenge on dead amphipods, crabs, and fish (Knisley *et al.* 1987, U.S. Fish and Wildlife Service 1993, U.S. Fish and Wildlife Service 1994). Most foraging occurs in the damp sand of the intertidal zone and scavenging has been observed to occur more often than predation (Knisley *et al.* 1987). Larval northeastern beach tiger beetles are sedentary predators that live in permanent, well-formed burrows on the beach from which they extend to capture passing prey. Adult tiger beetles are present on beaches from mid-June through August, where they spend most of the day along the water's edge (Knisley *et al.* 1987). Adults are active on warm, sunny days where they can be seen feeding, mating, or basking (U.S. Fish and Wildlife Service 1994). They are less active on rainy, cool, or cloudy days because they cannot maintain their own body temperature. They must rely on a variety of behaviors, such as foraging and basking, to maintain their high body temperatures (Knisley *et al.* 1987).

Typically, the adults lay eggs on the beach during the summer. In Maryland, some type of "nesting" behavior has been observed at night where females have been commonly found in shallow vertical burrows (5 - 8 centimeters [cm] deep) often with males guarding the mouth of the burrow (U.S. Fish and Wildlife Service 1994). Eggs have been recovered from some of these burrows, indicating that, at least in some instances, egg-laying occurs in these burrow and at night (C.B. Knisley and J. Hill pers. obs.). Larvae pass through three developmental stages and emerge as adults two years following egg-laying (Knisley *et al.* 1987, U.S. Fish and Wildlife Service 1993). However, some larvae that hatch early and catch an abundance of food may develop and emerge after only one year (U.S. Fish and Wildlife Service 1994). Larvae typically occur in an 8 - 12 meter (m) width of beach within and above the intertidal zone. However, this area may be wider in areas of washover or where the upper beach is flat and is periodically inundated by high tides (U.S. Fish and Wildlife Service 1994). Larvae have also been documented on beaches less than 8 m wide.

Development through three larval stages and pupation takes place in the burrow (Knisley *et al.* 1987). First instars occur from late August through September; second instars from September to late fall; and third instars from late fall to early spring and through the second year (Knisley *et al.* 1987). Knisley *et al.* (1987) found that the distribution of first and second instars was similar and that highest densities of third instars were in the mid- to upper-tidal zone. Therefore, most burrows were underwater during high tide. Larval burrow depths ranged from 9 - 24 cm and increased with distance from the water's edge, suggesting that burrow depth may be related to subsurface moisture (Knisley *et al.* 1987). Generally, larval burrows are plugged and not visible when the sand is dry and warm. Larvae lack a hard cuticle and are susceptible to desiccation, therefore, they tend to become inactive during hot, dry conditions (U.S. Fish and Wildlife Service 1994). Larvae are active primarily at night and plug their burrows during most of the day. "Burrows are reopened as soil moisture increased with incoming tides, plugged when covered by tidal wash, and then reopened briefly as the tides recede" (Knisley *et al.* 1987). "Larvae nearer to the water's edge tend to develop faster than those farther back where it is drier and prey items are less numerous (C.B. Knisley pers. obs.);" (U.S. Fish and Wildlife Service 1994). Recent studies have shown that larvae can survive flooding from three to six days (U.S. Fish and Wildlife Service 1994). Larvae have been found crawling on the beach, apparently moving to dig a new burrow in a better location (U.S. Fish and Wildlife Service 1994). This behavior is likely a response to variations in tide levels, soil moisture, or sand accretion and erosion patterns.

Larvae overwinter on the beach and hibernate until mid-March. When sand is damp and cool in the spring there are lower levels of larval activity (C.B. Knisley, Randolph Macon College, pers. comm. 1994). Because of winter mortality, number of active larvae are lower in the spring than in fall (A. Ringgold, Cape Cod National Seashore, *in litt.* 1993). Highest, most predictable periods of larval activity are from late August through early November. Larval activity is highly variable and greatly influenced by temperature, substrate moisture, tide levels, and seasons (U.S. Fish and Wildlife Service 1994). Knisley *et al.* (1987) conducted a study in Virginia and found that first emergence of adults ranged from 5 June to 13 June. Rainfall appears to enhance emergence since numbers of adults usually increase after a rainfall. The number of adults increases rapidly in June, peaks in mid-July, begins to decline through August, and by September few adults can be found.

There is a period of approximately two weeks after adults emerge when there is little to no dispersal (Hill and Knisley 1994a). Then a small, but significant number of beetles disperse to other sites. There is a regular dispersal phase after peak numbers emerge in early July (Knisley and Hill 1989, U.S. Fish and Wildlife Service 1993). Mark-recapture studies have determined that adults tiger beetles may travel five to twelve miles (Knisley and Hill 1989) from sites where they were marked, and some individuals may disperse tens of miles (U.S. Fish and Wildlife Service 1993). In Northumberland County, Virginia a total of 10,131 adults were marked and released; 91 beetles dispersed to new sites (mainly between two closer, larger sites 1.5 kilometers [km] apart) (Hill and Knisley 1994a). Large sites seem to serve as recruitment areas, while small sites serve as stop-overs during migration (Hill and Knisley 1994a). "It is probable that feeding or resting occur at these smaller sites and that without them, the larger sites may not experience as much migration" (Hill and Knisley 1994a). Migration serves to disperse genetic material and allow for the colonization of new sites and the ability to leave eroding sites (Hill and Knisley 1994a).

Populations of the northeastern beach tiger beetle are highly variable from year to year, because they are subject to local population extinctions and capable of dispersal and recolonization (U.S. Fish and Wildlife Service 1994). Two- to three-fold or greater year-to-year variations in numbers at a given site are common (Knisley and Hill 1989, 1990). Many sites that have adults, especially small numbers at small sites, are not suitable breeding sites, but may temporarily support adults that have dispersed from other sites (U.S. Fish and Wildlife Service 1994). Larvae are not found, or may not survive, at many sites.

Adult and larval northeastern beach tiger beetles are typically found on highly dynamic beaches with back beach vegetation and prefer long, wide beaches that have low human and vehicular activity, fine sand particle size, and a high degree of exposure (Knisley *et al.* 1987). Occurrence of this subspecies has been statistically correlated with back beach vegetation, low human and vehicle activity, and wide, long, dynamic beaches (Knisley 1987a). Ideal tiger beetle beaches are greater than 5 - 8 m wide (C.B. Knisley, pers. comm. 1994). "Adults tend to be concentrated on wider sections of beach, and occur in smaller number or may even be absent from nearby areas of narrow beach" (U.S. Fish and Wildlife Service 1994).

Historically, the northeastern beach tiger beetle was a common inhabitant of coastal beaches from Cape Cod, Massachusetts to central New Jersey, and along the Chesapeake Bay, from Calvert County, Maryland south through Virginia. Except for two Massachusetts populations, one on Martha's Vineyard

and one near Westport, the species is now extirpated from Massachusetts, Rhode Island, Connecticut, New York (Long Island), and New Jersey (U.S. Fish and Wildlife Service 1994). The stronghold of tiger beetle distribution is the Chesapeake Bay in Maryland and Virginia. Between 1988 and 1993, the northeastern beach tiger beetle was documented at 13 sites in Calvert County, Maryland (U.S. Fish and Wildlife Service 1994). Between 1989 and 1990, a total of 55 northeastern beach tiger beetle sites were documented in Virginia: 32 sites on the western shore of the Bay and 23 sites on the eastern shore of the Bay (Buhlmann and Pague 1992). Surveys in these two states have resulting in documenting 16 occurrences with greater than 500 adults, 10 sites with 100 to 500 adults, and numerous sites with less than 100 adults. Since those surveys, several additional tiger beetle sites have found in Virginia, resulting in approximately 60 known locations (because storms and other natural and man-made factors can rapidly alter beach habitat, it is difficult to determine exactly how many sites exist at a given time). Few of these sites are protected and many are threatened by human impacts (U.S. Fish and Wildlife Service 1994). Protected sites in Virginia include Bethel Beach Natural Area (Mathews County), Kiptopeke State Park (Northampton County), Hughlett Point Natural Area (Northumberland County), and Parkers Marsh Natural Area (Accomack County). The greater survival of this species in the Chesapeake Bay versus the Atlantic Coast may be due to historically lower levels of human activity in the Bay and less natural mortality from winter storms, erosion, etc. (U.S. Fish and Wildlife Service 1994). Although most Virginia and Maryland sites are believed to have been identified, it is likely that additional tiger beetle sites exist within the Chesapeake Bay.

Since its listing, several biological opinions have been completed for this subspecies in Virginia. On September 30, 1994, a non-jeopardy opinion was issued to the Corps for Dorothy Justis *et al.* to construct a bulkhead and groins in the Silver Beach subdivision, along the Chesapeake Bay, in Northampton County. This project was expected to result in the loss of adult beetles from 600 square feet, along with permanent habitat loss and potential adverse affects to adjacent populations due to alterations in sand transport. On June 3, 1994, a non-jeopardy opinion was issued to the Corps for the Peaceful Beach Estates Property Owners Association to construct groins (to attach to a bulkhead) along the Chesapeake Bay in Northampton County. This project was expected to result in the loss of adult and larval beetles from 28,000 square feet, along with permanent habitat loss within the footprint of the groins and potential adverse affects to adjacent populations due to alterations in sand transport (the effects of this project on the tiger beetle are described below). On May 11, 1995, a non-jeopardy opinion was issued to the Corps for the Bavon Beach Property Owners Association construction of a small outflow pipe to the Chesapeake Bay in Mathews County. This project was expected to result in the loss of adult and larval tiger beetles from 680 square feet of beach, with no permanent habitat loss.

In 1990, the Service determined threatened status for this beetle because of its greatly reduced range and high susceptibility to natural and human threats (Federal Register, Vol. 55, No. 152, August 7, 1990). Natural limiting factors include winter storms, beach erosion, flood tides, hurricanes (Stamatov 1972), and natural enemies. Primary natural enemies of adult tiger beetles are wolf spiders (*Arctosa littoralis*), asilid flies (C.B. Knisley, pers. comm. 1994), and birds (U.S. Fish and Wildlife Service 1994). Similar to other tiger beetles species, larval survivorship is low due to natural enemies and other limiting factors. Larvae are probably more vulnerable to habitat disruption than adults (Knisley *et al.* 1987) and are probably more limited by natural enemies (U.S. Fish and Wildlife Service 1994). The main larval enemy is a small,

parasitic wasp (*Methocha* species) that enters the larval burrow, paralyzes the larvae with a sting, and lays an egg on it. The egg hatches, and as it develops the larval wasp consumes the larval tiger beetle. Mites have also been found on larvae at Martha's Vineyard, but their effect, if any, is unknown (U.S. Fish and Wildlife Service 1994).

Anthropogenic threats to the northeastern beach tiger beetle include pollution, pesticides, high levels of recreational activity, off-road vehicular traffic, and shoreline development with its associated beach and shoreline stabilization (Knisley *et al.* 1987, Knisley and Hill 1989, Knisley and Hill 1990, U.S. Fish and Wildlife Service 1993). The extirpation of the northeastern beach tiger beetle from most of its range has been attributed primarily to destruction and disturbance of natural beach habitat from shoreline development, beach stabilization structures, and high levels of recreational use (Hill and Knisley 1994b). Oil slicks and use of pesticides for mosquito control may have contributed to the decline of this species (Stamatov 1972). Most of the large northeastern beach tiger beetle populations in Maryland and many of those in Virginia are threatened by activities associated with the increasing human population and all are subject to oil spills and beach erosion (U.S. Fish and Wildlife Service 1994). Adult foraging, mating, and ovipositioning can be disrupted by human activity (Knisley *et al.* 1987). However, larvae are probably more affected because they spend most of their time at the tops of their burrows waiting for prey, and are disturbed by even the slightest activities such as vibrations, movement, and shadows (Knisley *et al.* 1987). For many species of tiger beetles, larval densities are limited by food, and survival under natural conditions is very low (Knisley *et al.* 1987). "For example, only about 5% of the first instar larvae of several Arizona species reached adulthood" (Knisley 1987b). "Habitat disturbances could further reduce survivorship" (Knisley *et al.* 1987) and "... can eliminate suitable habitat, and when combined with natural mortality factors, could reduce populations to the point of extinction" (Knisley 1987b).

A study at Flag Ponds, a county park in Maryland, suggested that human impact was the most important factor influencing tiger beetle numbers (Knisley and Hill 1989). As visitor use of the park continued to drastically increase, no reduction in the population of adult tiger beetles was found (Knisley and Hill 1990). However, human impact appeared to result in the lack of newly emerged adults on the public beach, although later adults were quite common on this beach (Knisley and Hill 1990). Larval survivorship was significantly lower on the beach area with the greatest amount of human use (Knisley and Hill 1990). Areas that were firmly stomped, to simulate increased foot traffic, resulted in a 50 - 100% reduction in numbers of active larvae (Knisley and Hill 1989). In addition, 25% of the burrows did not reopen within 10 days of stomping, suggesting that larvae may have been dead (Knisley and Hill 1989). Negative effects of foot traffic apparently involve compaction or disruption of burrows or direct injury to larvae. Because larvae occur in the intertidal zone, burrows can be easily compacted or dislodged by vehicles or high levels of human activity (Knisley *et al.* 1987). Beach vehicle activity impacts to *C. d. media* were studied on Assateague Island in Maryland and Virginia where beetles were absent from areas with high levels of off-road vehicle traffic (Knisley *et al.* 1987).

Beach erosion, resulting from natural events or anthropogenic beach modifications, may also have serious effects on tiger beetles and their habitat. Tiger beetle larvae usually are not found at sites that have only narrow, eroded beaches. At sites with large adult populations, few or no larvae are found in areas with narrow beaches (1 - 3 m wide) (U.S. Fish and Wildlife Service 1994). Larvae seem to be limited to areas

where beaches are at least 5 m wide, with some sand above the high tide zone (U.S. Fish and Wildlife Service 1994). Although larvae are more sensitive to erosion and beach impacts than adults, adults are also less abundant in these narrow sections. Erosion within the Chesapeake Bay is a natural phenomenon resulting from rising sea levels and prevailing currents. However, this process has been exacerbated by beach development activities which interfere with the natural beach dynamics. Beach stabilization structures such as groins, jetties, riprap, and bulkheads, which are designed to reduce erosion, may interrupt and capture sand from longshore movement and build up the beach around the structure, but rob sand from the down-drift shoreline. There are many examples of erosion resulting from shoreline stabilization in the Chesapeake Bay. One example is the north section of Flag Ponds, Maryland, where the beach has become severely eroded over the last 10 years since construction of a jetty at Long Beach just to the north (U.S. Fish and Wildlife Service 1994). The eroding beach south of the ferry dock at Kiptopeke Beach in Northampton County, Virginia may be another example of this phenomenon (U.S. Fish and Wildlife Service 1994). Natural points and spits may have the same effect as man-made features.

Bulkheads and riprap typically result in the reflection of wave energy, which ultimately removes the beach and steepens the profile (takes from 1 to 30 years). These structures also prevent the back beach from supplying sand to the forebeach, and concentrate wave energy at the ends of the bulkhead, resulting in erosion at these points (Knisley and Hill 1994). Knisley (1990) noted that "surveys in various sites in the Chesapeake Bay indicate very few larvae at sites or within sites where groins or other beach stabilization structures are located."

Knisley and Hill (1994) conducted a study north and south of the mouth of the Little Wicomico River (Smith Point area), and at Duck Pond, Gwynns Island, and Jarvis Point on the western shore of the Chesapeake Bay and at Peaceful Beach, Silver Beach, Cape Charles, Picketts Harbor, and Elliotts Creek on the eastern shore of the Bay. Numbers of adults were lowest at modified sites (i.e., sites with bulkheads, groins, riprap, and/or dredge deposition). "In general, the longest and widest beaches with natural shoreline had many more adults and larvae than modified long or short, narrow beaches..." (Knisley and Hill 1994). The mean number of larvae per transect at natural beaches was 15.3; 12.1 on beaches with dredge material deposition; 6.5 at sites with bulkheads or riprap; 3.7 at sites with groins; 3.3 for narrow beaches (less than 2 m wide); and 1.5 for sites with bulkheads and groins. The unexpectedly high number of larvae for bulkhead beaches in this study was the result of high larval numbers at one bulkheaded section of one beach. Most other beaches with bulkheads or riprap had few or no larvae (Knisley and Hill 1994). "Distribution and abundance of larvae provide a better indication of habitat quality and utilization for *C. d. dorsalis* since the presence of high numbers of larvae indicates the habitat is likely suitable for (long-term) larval recruitment and development. Adult presence, however, indicates only adult utilization which may perhaps be transitory during dispersal" (Knisley and Hill 1994). Modified sites generally had lower numbers and densities of larvae, but they did support recruitment and larval development (at least into the fall season) (Knisley and Hill 1994). From this type of study it is difficult to determine definitive results because, for example, shoreline modifications typically occur in areas that are experiencing high erosion rates and thus may have fewer larvae because they have narrow beaches (Knisley and Hill 1994). This study and others shows that narrow beaches of less than 2 - 3 m support significantly fewer larvae than wider beaches (Knisley and Hill 1994). It is still not known if larvae can successfully complete development through one or two winters on beaches with modified shorelines (Knisley and Hill 1994).

Knisley and Hill (1994) concluded that, “preliminarily, it seems that bulkhead or revetment along the shoreline has a negative impact on the habitat of this species while groins probably have a lesser effect on the habitat” and “...the impacts of...structural modifications can only be determined with certainty by systematic pre- and post-construction studies to assess cause and effect.”

Additional work has been done on a few of the areas from the above study. Roble (1994) found that in Northampton County, "Silver Beach continues to support a large population of beetles despite the fact that much of the shoreline is within a residential development and several groins have been constructed to stabilize the beach. Further research on the impacts of beach stabilization structures on larval and adult tiger beetles, and correspondingly appropriate regulatory activities, are perhaps the two most important steps that can be taken to protect these sites."

At the northern end of Silver Beach is an area known as Peaceful Beach that supports tiger beetles. It was surveyed in November, 1993 and the results indicated that the entire length of shoreline provided suitable habitat for recruitment and development of tiger beetle larvae (Knisley 1993). Knisley (1993) indicated that "this site probably supports a good, stable population." A bulkhead was constructed at the site in 1994. Approximately 50% fewer larvae were found between 1993 and 1994 (after the bulkhead was constructed), however, this section of beach was severely eroding before the bulkhead was constructed and larval counts can be extremely variable (Knisley 1994a). The areas with bulkheads had smaller beach widths (1 m or less between current high tide and bulkhead), supplying little or no suitable larval habitat (Knisley 1994a). Some larvae were found near the bulkhead, but Knisley (1994a) indicated that they were not likely to survive to maturity because they would not be able to migrate landward to avoid severe storms and erosion during the winter months. He stated that “...the beach along this groin-less bulkhead will continue to erode and probably negatively impact larvae there in the immediate future. Construction of the groins will perhaps reduce these erosional effects by trapping sand or otherwise provide some protection for these larvae” (Knisley 1994b).

Beach nourishment is likely destructive to larvae and may render beach habitat unsuitable for subsequent larval recruitment and development (Knisley 1991). However, deposition of dredged material may create habitat. Dredged sand was placed south of Cape Charles in 1987, and in 1989 there was a good population of both adult and larval tiger beetles (Knisley undated proposal). Although the addition of sand may actually maintain the habitat in the long-term, it is likely that its immediate effects would result in larval mortality through crushing, smothering, or inability to dig out and resume normal activities (U.S. Fish and Wildlife Service 1994). Sand deposition could also have indirect negative effects on food (amphipod) availability (U.S. Fish and Wildlife Service 1994). The short- and long-term effects of beach nourishment on larvae need to be investigated. Since larvae seem to be very specific in their microhabitat distribution, sand particle size or other physical aspects of the microhabitat (e.g., slope, profile), may be critical (U.S. Fish and Wildlife Service 1994).

“Because the species seems very susceptible to frequent local extirpation of populations, either from human or natural causes, preservation measures will require protection of a series of adjacent or nearby sites in a given area” (Knisley 1991). A northeastern beach tiger beetle conservation strategy has been prepared for Virginia (Donoff *et al.* 1994). Initially, 15 priority conservation sites were identified (Kiptopeke State

Park, Picketts Harbor, Cape Charles, and Savage Neck in Northampton County; Scarborough Neck and Hyslops Marsh in Accomack County; Sandy Point Island, Rigby Island, Bethel Beach, Bethel Beach North, Winter Harbor, and New Point Comfort/Bavon Beach in Mathews County; Smith Point and Hughlett Point in Northumberland County; Grandview Beach in the City of Hampton). However, due to the large number of tiger beetle sites in Virginia, the conservation strategy focused on 12 priority conservation sites in Mathews (Sandy Point Island, Rigby Island, Bethel Beach, Bethel Beach North, Winter Harbor, and New Point Comfort/Bavon Beach), Northampton (Kiptopeke State Park, Picketts Harbor, Cape Charles, and Savage Neck), and Accomack (Scarborough Neck and Hyslops Marsh) Counties (Donoff *et al.* 1994). The primary factors considered in developing the conservation plans were: (1) extent of occupied and potential habitat, (2) maintenance of dynamic beach strand habitat, (3) provision of buffer lands, and (4) provision for species movement corridors. "Several of the priority conservation sites are best treated as components of larger macrosites [several significant populations linked together]" (Donoff *et al.* 1994). The Bethel Beach macrosite would include Sandy Point Island, Rigby Island, Bethel Beach, Bethel Beach North, and Winter Harbor. Another macrosite includes Cape Charles, Picketts Harbor, and Kiptopeke State Park; three small sites, Elliotts Creek, Cape Charles-Old Plantation Creek, and Arlington-Old Plantation Creek, would also be included (Donoff *et al.* 1994).

Recovery for the tiger beetle will depend to a large extent on re-establishing the species across its former range along the Atlantic Coast and protecting it within the Chesapeake Bay (U.S. Fish and Wildlife Service 1994). The best approach for achieving this is through landscape-scale conservation. The Service's recovery plan for this species defines several Geographic Recovery Areas (GRA) for conserving the northeastern beach tiger beetle and its ecosystem, providing a framework within which protection and population establishment efforts can be ranked and implemented (U.S. Fish and Wildlife Service, 1994). Recovery will hinge on maintaining the ecological integrity of essential tiger beetle habitat within each GRA, in order to achieve the population levels and structure needed for this species. Nine GRAs have been identified, four along the Atlantic Coast, two in Maryland, and three in Virginia (eastern Shore of Chesapeake Bay, western shore of Chesapeake Bay north of the Rappahannock River, and the western shore of Chesapeake Bay south of the Rappahannock River). Full recovery will require the establishment of populations in each of the four Atlantic Coast GRAs as well as protection of existing populations in each of the Bay GRAs. Within the Chesapeake Bay, delisting can be considered when a total of 25 populations are permanently protected (defined as long-range protection from present and foreseeable anthropogenic and natural events that may interfere with their survival. Adequate protection measures include land acquisition, conservation agreements and/or easements, and management measures to protect the species' habitat; this includes accounting for off-site impacts such as littoral sand drift) at extant sites distributed among the five Bay GRAs as follows: Calvert County, Maryland, 4 largest populations; Tangier Sound, Maryland, two large (≥ 500 adults) populations; Eastern Shore, Virginia, four large populations and three others; western shore of Bay (Rappahannock River north), Virginia, three large populations and one other; western shore of Bay (Rappahannock River south), Virginia, two large populations and three others (U.S. Fish and Wildlife Service 1994).

ENVIRONMENTAL BASELINE

Status of the Species - The applicant's property is bordered by Old Plantation Creek on the north and

Elliotts Creek on the south. The site was part of the DiCanio planned urban development that went bankrupt after selling only the waterfront lots along Old Plantation Creek. Habitats, L.L.C. purchased the remaining land and is selling the other waterfront property while making larger lots and maintaining a large farm parcel intact. The beach is approximately 4,900 feet in length and for most of the shoreline is approximately 50 feet wide. Old Plantation Creek is shallow at its mouth (and along the Chesapeake Bay) with mudflats, sandflats, submerged aquatic vegetation (SAV), active leased clam/oyster beds, and some deep water channels. Its mouth can be navigated with the tide and with knowledge of the shifting sand. Elliotts Creek has mudflats, sandflats, SAV, inactive leased clam/oyster beds and shallow water channels. Its mouth is very shallow and narrow and presently cannot be navigated at any time. There is a sand spit at the mouth of Old Plantation Creek and the mouth of Elliotts Creek is basically a dune/beach system with a small beach. Costin Pond is in the middle of the property and consists of a remnant tidal creek (now freshwater) with the dune/beach system as its dam. It is unknown whether years ago a tidal creek was dammed and made into a farm pond or whether the pond was naturally created by the dune/beach system. However, the dune/beach berm is now natural.

The shoreline along the Chesapeake Bay is composed of beach with eroding uplands. The widest parts of the beach are at the sand spit to the north, a small marsh pocket located halfway between Old Plantation Creek and Costin Pond, Costin Pond, and the mouth of Elliotts Creek. Halfway between Costin Pond and Elliotts Creek there are numerous fallen trees (eroding forest debris) along the beach. On some sections of the beach, seasonally higher high tides reach portions of the upland bank; at other times, seasonally lower high tides do not reach these same portions of the upland bank; at other sections of the beach, seasonally higher high tides do not reach the upland bank. There are numerous shifting, shallow sand bars parallel to and offshore of the shoreline along the Chesapeake Bay. The erosion rate is 2.3 feet per year. The applicant has stated that 90 feet has been lost in front of the Phase I area.

In 1989, approximately 16 adult tiger beetles per 100 m were documented in the action area, but no larval data was collected. The action area (known as the Arlington-Old Plantation Creek tiger beetle site) was noted as a small area having low numbers of adult tiger beetles and good habitat quality. At the time of the survey, natural hazards were noted as erosion of beach frontage along the Bay due to sea level rise, potential flooding during coastal storms, and a severe erosion rate (5.0 feet/year). The research/monitoring needs noted for this site include adult and larval beetle surveys to assess annual fluctuation in smaller populations (M. Donoff, Virginia Department of Conservation and Recreation, Division of Natural Heritage, pers. comm. 1995). Also, if beach stabilization occurs in the future, the site should be surveyed before and after such event to monitor the effects of this activity on the tiger beetle. No additional tiger beetle surveys have been conducted since 1989. However during the Service's site visit in 1994, numerous adult tiger beetles, including mating pairs, were observed and the beach appeared to provided ideal larval habitat. North and south of the action area are several tiger beetle sites. Immediately to the north of Old Plantation Creek are the Cape Charles South and Old Plantation Creek tiger beetle sites that support numerous adult and larval beetles (Roble 1994) (Figure 5). Immediately to the south of Elliotts Creek are the Elliotts Creek and Picketts Harbor tiger beetle sites that also support numerous adult and larval beetles (Roble 1994) (Figure 5). The Cape Charles tiger beetle site (begins approximately 500 m south of Cape Charles Harbor and extends 900 m south) is one of the best sites in Virginia and is a part of the metapopulation on the Cape Charles-Kiptopeke Megasite. Few such populations are still in existence today, and therefore the

protection of these existing metapopulations are crucial to the long-term survival of the tiger beetle.

The Elliotts Creek tiger beetle site (located south of Elliotts Creek and north of Picketts Harbor) is a small site that supports an abundance of tiger beetles and is undisturbed, relatively inaccessible with a well-formed beach system (Figure 5). The Picketts Harbor tiger beetle site (located south of Elliotts Creek and north of Butlers Bluff) supports one of Virginia's top five tiger beetle populations and lies within the only recognized macrosite for this species along the Eastern Shore of Virginia (Figure 5). "Picketts Harbor beach currently appears to be actively accreting sand, the sources of sand deposition [are likely] the eroding beaches to the north of this site (up to Old Plantation Creek) and the eroding bluff directly south of this site (Butlers Bluff)" (M. Donoff, pers. comm. 1995). However, Butlers Bluff has been altered through development and removal of vegetation on top of the bluffs and construction of groins along the base of the bluffs. The areas to the north and south of Picketts Harbor are eroding and it is likely that both of these areas of erosion are supplying sand to Picketts Harbor (L. Hill, pers. comm. 1995), and therefore should be designated as areas of importance. Sand sources for Picketts Harbor include off-shore sand bars, sand dunes, Butlers Bluff, and beaches to the north of the site.

As discussed in the Rangewide Status of the Northeastern Beach Tiger Beetle, a conservation strategy has been prepared for Virginia and includes priority conservation sites in Northampton County (Donoff *et al.* 1994). The sites in Northampton County include Kiptopeke State Park, Picketts Harbor, Cape Charles, and Savage Neck (Donoff *et al.* 1994). The project area is located partially within the primary ecological boundary and completely within the secondary ecological boundary for the Picketts Harbor conservation site (Figure 4). The project area is part of a larger macrosite that includes Cape Charles, Picketts Harbor, and Kiptopeke State Park (Donoff *et al.* 1994).

Effects of the Action - In evaluating the effects of the Federal action under consideration in this consultation, 50 CFR 402.2 and 402.14(g)(3) require the Service to evaluate the direct and indirect effects of the action on the species. Direct impacts to the tiger beetle will result in the crushing of adult beetles and subsequent injury or death, during construction by use/ placement/ stockpiling of equipment and materials on the beach and foot traffic. Construction will also result in a temporary loss of habitat for adults through disruption of their daily activity patterns (i.e., foraging, mating, basking, egg-laying). Larval tiger beetles will be directly affected through crushing, dislodging, and entombment, resulting in death or injury, during construction by use/ placement/ stockpiling of equipment and material on the beach and heavy foot traffic. Existing habitat, for both larval and adult beetles, will be permanently lost within the footprint of the riprap, groins, and spurs (approximately 14,415 square feet above MLW).

Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). The riprap will prevent larvae from being able to migrate landward as they mature, resulting in an inability to survive winter storms and erosion. In addition, the riprap will eliminate the natural sloughing and erosion of sand from the banks and, subsequently, the upland replenishment of sand to the beach. Riprap will also likely result in increased erosion of the beach, resulting in a narrow beach less suitable for adult and larval tiger beetles. The proposed groins are designed to capture sand from longshore movement. Net sand transport is to the south, but shifts annually (S. Hardaway, pers. comm. 1995). Each groin will trap sand on its north side, while starving sand on its south

side, alternately building/eroding beach. There will be seasonal and yearly differences in amounts and distribution of sand between the groins. Thus, a secondary impacts of the groins will probably be increased elimination of tiger beetle larvae by smothering activities of (captured) sand transport and exposing activities of erosion. Knisley (1990) noted "my observation on the distribution of *C. dorsalis* larvae indicate they are most abundant in slowly accreting areas of beach, suggesting that the pattern of particle size distribution and layering of sand on beach is important. Consequently, significant disruptions of the beach could have a negative impact." The spurs will also alter longshore sand transport similar to the groins, affecting 50 to 300 feet to the north and south of each spur (S. Hardaway, pers. comm. 1995). The direct and indirect affects discussed above may also occur in the area between Phases I and II if it is utilized during construction. Otherwise, the beach between the two phases should become a stable cove over time and should continue to provide tiger beetle habitat. However, depending on the beach profile, width, distribution, and amount of sand, this area may no longer be suitable for larvae and may be used only by adults during dispersal.

The natural beach will be altered in its width, profile, and distribution and amount of sand. The northeastern beach tiger beetle will not survive at the current population level at the project site. However, the exact extent of impacts to the northeastern beach tiger beetle population following completion of the project cannot be quantified. Seasonal and yearly variation in amounts and distribution of sand between the groins will continually displace adult tiger beetles and expose and displace larval tiger beetles. If they are able to survive at this site, it is possible that the groins and spurs may preserve some of the habitat for larval and adult beetles. However, seasonal and yearly variation in amounts and distribution of sand between the groins/spurs will continually alter (and occasionally totally remove) the habitat and expose and displace larval tiger beetles. The groins/spurs will provide some beach, allowing migration of adults between the populations to the north and south of, as well as within, the project area.

The beaches that provide tiger beetle habitat within the action area, to the north and south of the shoreline stabilization structures, may be altered through changes in sand accretion and erosion due to the shoreline stabilization structures. However, because of the extensive off-shore sandbar system, the riprap, groins, and spurs are not expected to measurably alter accretion or erosion of beaches beyond 300 feet north and south of the outermost spurs or to the north and south of the action area. Because sand transport to the beaches of the Cape Charles, Old Plantation Creek, Elliotts Creek, and Picketts Harbor tiger beetle sites will not be affected by this project, as proposed, no habitat degradation or alteration of tiger beetle populations is expected to occur at these sites. Additionally, the majority of the action area will continue to provide adult and larval tiger beetle habitat as it currently exists. Because the groins/spurs will trap sand, some beach will exist with the project area, providing habitat for adult beetles during migration; thereby allowing genetic exchange to continue among the populations that make up the Cape Charles-Kiptopeke Megasite.

Cumulative Effects - Cumulative effects include the effects of future State, 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.

Future maintenance of the shoreline stabilization structures (such as the addition, removal, or reconstruction of stone) may not require Corps' authorization. These activities may result in injury or death to adult and larval tiger beetles through heavy foot traffic on beach areas, use/stockpiling of heavy equipment, and stockpiling/ placement of materials. Maintenance activities may also result in temporary or permanent habitat loss. The construction of additional riprap or a bulkhead above MHW may occur within the action area in the future and such activities would not require Corps' authorization. This type of activity would adversely affect tiger beetles directly through death or injury during pre-construction and construction activities and temporary and permanent habitat loss. Any surviving larvae would likely die during winter storms and erosion because their ability to migrate landward would be restricted. As previously discussed, this type of shoreline hardening without groins, breakwaters, etc. is likely to result in erosion of the beach and subsequently, the destruction of tiger beetle habitat. In addition, hardening of the entire shoreline within the action area would likely result in loss of sand supplied to beaches south of the action area. This could result in degradation of tiger beetle habitat and a subsequent population decline at the Elliotts Creek and Picketts Harbor populations. If these tiger beetle sites became significantly degraded, the recovery of the tiger beetle within the Chesapeake Bay would become unlikely since these sites appear to be an essential part of the Eastern Shore of Virginia GRA.

Previously, the applicant requested a jurisdictional determination from the Corps, part of which involved control of *Phragmites australis*. This included burning, herbicide application, filling, scraping, and planting other vegetation in areas containing *Phragmites*. Except for filling, these activities would not require Corps' authorization. *Phragmites* is an invasive plant species that is known to colonize beach fronts as well as marsh habitats. Any disturbance near this invasive grass may cause it to spread. If areas containing *Phragmites* are disturbed, it could spread into tiger beetle habitat causing the beaches to become vegetated and thereby unsuitable for adult and larval tiger beetles.

During the Service's site visits, the applicant stated his desire to recontour and grade the existing beaches. Such activities would result in adverse affects to adult and larval tiger beetles. Adult tiger beetles could be killed or injured and would be prevented from carrying out their daily activities (e.g., foraging, mating). Larval tiger beetles could be crushed, entombed, or dislodged. Food availability to both adults and larvae could be affected. In addition, depending on the degree of beach alteration, the habitat may be degraded or become unusable for tiger beetles.

Agricultural fields adjacent to the action area may be treated with pesticides that could drift to the beach, possibly killing tiger beetles.

Additional future activities that may affect the northeastern beach tiger beetle include dredging Elliotts Creek (the applicant has stated that he may do this in the future), use of dredge material for beach nourishment (the applicant has stated that he may do this in the future), and additional shoreline stabilization (channelward of MHW). These activities will require a permit from the Corps and will be reviewed when a Federal permit is applied for.

CONCLUSION

After reviewing the current status of northeastern beach tiger beetle throughout its range and in the action area, the environmental baseline for the action area, the effects of the proposed pipeline construction and the cumulative effects, it is the Service's biological opinion that the issuance of a DOA permit for this project, as proposed, is not likely to jeopardize the continued existence of the northeastern beach tiger beetle. No critical habitat has been designated for this species, therefore, none will be affected.

III. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined 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 as 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 any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant. 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 a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

AMOUNT OR EXTENT OF TAKE

The Service anticipates that incidental take of the northeastern beach tiger beetle will be difficult to detect because the population density of the beetle within the project area has not been determined and any beetles (adult or larvae) that are killed during project construction, stockpiling of equipment and materials, and habitat loss will be difficult to observe or locate due to their coloring, small body size, and tendency for larvae to remain beneath the surface. However, the level of take of this species can be anticipated by the areal extent of the potential habitat affected. This incidental take statement anticipates the taking of northeastern beach tiger beetles from the beach between the toe of the bank and MLW from 200 feet north of the northern end of Phase I through 200 feet south of the southern end of Phase II resulting from construction activities, stockpiling of materials and equipment, habitat alteration (modifications to the beach profile, width, and distribution and amount of sand), and temporary and permanent (14,415 square feet) habitat loss.

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 northeastern beach tiger beetle or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service considers the following reasonable and prudent measures to be necessary and appropriate to

minimize take of the northeastern beach tiger beetle. The measures described below are nondiscretionary, and must be implemented by the Corps so that they become binding conditions of any permit issued to the applicant in order for the exemption in Section 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 require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

- o Human activity, materials, and equipment on the beach must be minimized to reduce the impact to adult and larval tiger beetles.

- o Construction activities must be conducted during an appropriate time of year to minimize impacts to adult tiger beetles.

TERMS AND CONDITIONS

In order 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. These terms and conditions are nondiscretionary.

1. No construction, earth-moving, or placement of materials and equipment on the beach between June 1 and September 15 of any year.

2. No maintenance of riprap, groins, or spurs between June 1 and September 15 of any year if any beach exists between MLW and the toe of the riprap.

3. Materials will be transported to the beach only on an as-needed basis.

4. The alignment of the riprap will be staked by the permittee with assistance from a representative of the Corps and the Service to ensure that the riprap will be placed as far landward as possible.

5. All trees to be cleared for construction access will not be felled onto the beach, and if a tree does fall on the beach it will be removed immediately.

6. No material or equipment on the beach between the Phase I and Phase II construction sites.

7. No use of vehicles or heavy equipment on the beach outside of the Phase I and Phase II construction areas.

8. No ground disturbance will occur on the beach outside of the Phase I and Phase II construction areas.

9. Any sand removed during creation of trenches will be immediately removed from the beach.

10. Sand located channelward of the toe of the riprap will not be excavated for use as backfill.

11. No refueling of equipment will occur on the beach.

12. No use of pesticides on the beach.

13. To address the success of the reasonable and prudent measures, the proposed project must be monitored to determine the exact extent of impacts to tiger beetles and their habitat. Tiger beetle inventories (adult and larval) must be conducted along with assessment of beach characteristics. The permittee will fund one larval inventory of the site prior to conducting any construction-related activities on the beach (report due to Service 30 days after survey completion) and will fund two inventories of the project site per year for each of five years following construction. The inventories will assess use of the project site by adults and larvae. The inventories must be conducted by an individual or individuals proficient in the identification, research, and biology of northeastern beach tiger beetles (see attached list). The inventories will be conducted in sufficient detail to assess the value of the beach habitat to the tiger beetle population and will include detailed descriptions of the beach width and profile at set intervals along the entire length of shoreline. Initial design of the inventory plan must be approved by the Service. For each of the five years, the permittee will submit to the Service a report documenting the surveyor and dates, methods, and results of the inventories and beach measurements, within 30 days following completion of the second inventory. Adult tiger beetles will be censused on warm, sunny days between July 8 and August 8. Surveys will be conducted from the southern edge of Old Plantation Creek south to the northern edge of Elliotts Creek. The total number of adults observed on the beach will be recorded. Also, partial counts will be recorded every 50 - 100 m to obtain density estimates. Larval surveys will be conducted between October 10 and 21 during low tide on cool and/or cloudy days. The number of larval burrows present within 2 m wide transects that extend from the water line to the back of the beach will be recorded. Transects will be separated by 50 - 100 m. An attempt to identify instar stage of larva should be made. The mean number of burrows should be calculated.

14. The applicant is 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
P.O. Box 480
Rt. 17, Mid-County Centre
White Marsh, VA 23183
(804) 693-6694

15. Care must be taken in handling any dead specimens of northeastern beach tiger beetle 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, initial notification must be made to the following Service Law Enforcement office:

Division of Law Enforcement
U.S. Fish and Wildlife Service
P.O. Box 187
Yorktown, VA 23690
(804) 890-0003

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures the Service believes that no direct impacts to adult beetles will occur within the action area and no direct impacts to larval beetles will occur outside of the Phase I and II construction sites. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

IV. 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 and other recovery activities, or to develop information to benefit the species.

The Service recommends that the Corps visit the site several times during construction to ensure that the terms and conditions are strictly adhered to. This will insure that adverse impacts to tiger beetles and their habitat are minimized.

The Service also recommends that no permits involving shoreline/beach stabilization or alteration be issued to individual lot owners in Phase I area. This will insure that if tiger beetles continue to exist after completion of the proposed project, their population at this site or adjacent sites will not be further degraded or suffer additional habitat alteration.

In order for the Service to be kept informed of actions that minimize or avoid adverse effects or benefit listed species or their habitats, the Service requests notification of the implementation of any of these conservation recommendations by the Corps.

V. REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the Corps' 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 and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the 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.

Unless information in this biological opinion is protected by national security or contains confidential business information, the Service recommends that you forward a copy to the following agency:

Plant Protection
Virginia Department of Agriculture and Consumer Services
P.O. Box 1163
Richmond, VA 23209

If this opinion is not provided by the Corps and does not contain national security or confidential business information, the Service will provide a copy to this State agency ten business days after the date of this opinion.

FISH AND WILDLIFE COORDINATION ACT COMMENTS

The following comments constitute the report of the Service and the Department of the Interior on this project and are submitted under provisions of the FWCA.

1. Issue a permit only for the construction of the groins. This will slow and/or reduce shoreline erosion at the project site while maintaining an upland source of sand and minimizing impacts to tiger beetle habitat.
2. Incorporate the terms and conditions as special permit conditions on any permit issued for the proposed project.
3. Work with the applicant to insure that the riprap is located as far landward as possible.

The Service appreciates this opportunity to work with the Corps in fulfilling our mutual responsibilities under the ESA and the FWCA. Please contact Cindy Schulz of this office at (804) 693-6694 if you require additional information.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

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APPENDIX A - CONSULTATION HISTORY

- 07-11-94 The Service received a request from the Corps to review several activities for which the applicant had requested a jurisdictional determination from the Corps. These activities included *Phragmites* control, construction of a private pier, and construction of a bulkhead with backfill, riprap, groins, and breakwaters.
- 07-27-94 The Service sent a letter to the Corps indicating that the northeastern beach tiger beetle had been previously documented in the project area.
- 08-23-94 The Service participated in a site visit with the applicant and his consultant to discuss the items proposed in the Corps 7/11/94 request to the Service..
- 01-04-95 The Service participated in a site visit with the Corps to discuss impacts from the proposed riprap and groins.
- 01-24-95 The Service received a copy of the Joint Public Notice.
- 01-27-95 The Service received the Corps' request to initiate formal consultation.
- 02-24-95 The Service sent a letter to the Corps indicating that we had received the Corps' request for formal consultation and would provide our Fish and Wildlife Coordination Act comments with the biological opinion.
- 04-26-95 The Service paid VIMS for a set of aerial photographs of the project site as well as to the north and south in order to evaluate project impacts.
- 04-26-95 The Service sent a letter to the Corps, with a copy to the applicant, requesting an extension of formal consultation to collect additional information.
- 05-12-95 The Service met with the Corps and applicant on-site to discuss erosion of the shoreline near Costin Pond.
- 5-15-95 The Service recieved the Corps' May 9, 1995 letter extending formal consultation.
- 5-19-95 The Service met with Scott Hardaway, VIMS, to review aerial photogrpahy and discuss the effects of the proposed project on sand transport and shoreline erosion/acretion.
- 06-20-95 The Service met with the applicant, Corps, and Scott Hardaway, to discuss project design modifications.
- 07-20-95 The Service received revised project drawings.

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bcc: ARD-ES, Region 5
Endangered Species Coordinator, Region 5
CBFO Reading File
Endangered Species Biologist, CBFO
Law Enforcement, Yorktown
(Attn: Dan Hurt)
Law Enforcement, Richmond
(Attn: Senior Resident Agent)

10 business days after the date of this letter, mail copies to:

_____ VDGIF, Richmond
(Attn: Endangered Species and Nongame Coordinator)
DNH, Richmond
(Attn: Tom Smith)
VDACS, Richmond
(Attn: John Tate)
Dr. Knisley, Randolph-Macon College, Ashland, VA