

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

Attn: William McGlaun
Regulatory Branch

Re: Lloyd Chappell, Permit Application
No. 94-1538-51, Mathews County,
Virginia

Dear Colonel Perkins:

The U.S. Fish and Wildlife Service has reviewed the Department of the Army permit application 94-1538-51, submitted by Lloyd Chappell, to construct a private pier with an attached groin in Mathews County, Virginia. Your May 22, 1995 request for formal consultation was received on May 26, 1995. This document represents the Service's biological opinion on the effects of that action on the northeastern beach tiger beetle (*Cicindela dorsalis dorsalis*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 et seq.). It should be noted that the tiger beetle has not been documented at the project location, but the applicant has chosen to assume this species is present. A complete administrative record of this consultation is on file in this office.

I. CONSULTATION HISTORY

Consultation history is provided in Appendix A.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The applicant has applied for a permit to construct a 100-foot long, 5-foot wide, open-pile pier with a 12-foot by 10-foot “L” head and an 8-foot by 5-foot step down inboard of the L-head and an attached 100-foot timber sheet pile groin at Cherry Point on Gwynns Island in the Chesapeake Bay (Figure 1). The site is at a community known as Kibble Pond located off East Shore Drive which is accessed from Route 664 at Cherry Point in Mathews County, Virginia (Figure 2). The construction will require high pressure “pumping in” of the pilings and sheeting boards for the pier and groin until a depth (channelward of mean low water [MLW]) is reached, adequate to float a barge which carries a pile driver. From this point channelward, the pilings and sheeting board will be driven in by the pile driver from the barge. The width of the construction area between MLW and the vegetation line (27 feet) is likely to be approximately 10 feet wide. During the site visit, the applicant stated that they are not sure that they will construct the groin, but they want to have a permit to do so in case they feel that they need one. Currently, the undeveloped beach in the vicinity of the project is 240 feet wide. Lots are 60 feet wide along the shoreline, so there are about four lots along this beach width. The applicant plans to put the pier/groin 55 feet from an existing groin that borders the west side of their lot.

The action area for this project is the 240-foot wide undeveloped beach from MLW landward to the vegetation line (this includes the applicant’s lot and the lots to the east).

RANGEWIDE STATUS OF THE SPECIES

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 a 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 increases 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 - This portion of Gwynns Island was first developed during the early 1950s as a weekend cottage area that focused upon water-related recreational activities. Currently, it is a small community of seasonal beach cottages with several year-round residents. The shoreline in the action area is a sandy beach that varies in width from approximately 35-50 feet and is 240 feet long with a northeast fetch from the Chesapeake Bay. It is a high energy beach that appears to have been stabilized by multiple low profile groins, all installed since the Ash Wednesday storm of 1962. The project site has a stable, vegetated back beach. At the east end of the 240-foot wide beach is riprap and a pier with little sand beyond it. At the west end of the beach are riprap, piers, and groins with some beach in between.

There are eight known northeastern beach tiger beetle sites in Mathews County. Adult tiger beetles (60) have been documented approximately one mile to the south of the project site (Buhlmann and Pague 1992). However, tiger beetle surveys have not been conducted within the action area. The beach in the action area has a vegetated back beach and appears to provide good habitat for both larval and adult tiger beetles within a small area.

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 within the 10-foot wide, 27-foot long construction area (270 square feet). 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 within the construction area. Existing habitat, for both larval and adult beetles, will be permanently lost within the footprint of the pier pilings and the groin between MLW and the vegetation line on the beach.

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 proposed groin is designed to capture sand from longshore movement. The beach within the action area, to the east and west of the groin, will be altered through changes in sand accretion and erosion. The exact extent of impacts to the northeastern beach tiger beetle population following completion of the project cannot be predicted. Seasonal and yearly variation in amounts and distribution of sand along side the groin will continually alter (and occasionally totally remove) the habitat and displace adult tiger beetles and expose and displace larval

tiger beetles.

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.

Construction of shoreline stabilization structures (e.g., riprap, bulkhead) above mean high water (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 adjacent to the action area. This could result in degradation of tiger beetle habitat and a subsequent population decline.

Other shoreline stabilization activities (channelward of MHW) may affect the beetle. These activities will require Corps' authorization 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 pier and groin 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 270 square feet along the pier/groin alignment and 200 feet to the east, 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 (within the footprint of the pier pilings and the groin) 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 species 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 or equipment on the beach between June 1 and September 15 of any year.
2. No construction, earth-moving, placement of materials, or use of vehicles or heavy equipment on the beach outside of the 270 square-foot construction area.
3. Materials must be transported to the beach only on an as-needed basis.
4. The 270 square-foot construction area will be accessed landward of the vegetation line on the beach; not by crossing the beach itself.
5. Foot traffic on the beach outside of construction area will be minimized.
6. No maintenance of the groin or pier pilings between June 1 and September 15 of any year.
7. No refueling of equipment on the beach.
8. No use of pesticides on the beach.
9. 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
U.S. Route 17, Mid-County Centre
P.O. Box 480
White Marsh, VA 23183
(804) 693-6694

10. 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 adult beetles will be incidentally taken and incidental take of larvae will not occur beyond the 270 square-foot construction area and 200 feet to the east. 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 work with the applicant to avoid construction of the groin. Construction of a pier will result in only minor impacts to the tiger beetle and its habitat. However, the effects from a groin will be more severe. If the Corps does issue a permit to construct a groin and it is built, the Service recommends that the Corps conduct before and after surveys to determine the impact of shoreline alteration on adult and larval tiger beetles. The Service will be pleased to work with the Corps in designing appropriate survey methodology and reporting requirements.

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.

The Service appreciates this opportunity to work with the Corps in fulfilling our mutual responsibilities under the ESA. 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

- 04-06-95 The Service received the Corps' request to review the proposed project for impacts to Federally listed species.
- 04-17-95 The Service sent the Corps a letter stating that the Service position on this project was no action.
- 04-20-95 The Service discussed this project with tiger beetles experts and determined that a survey for the northeastern beach tiger beetle had not been conducted in this area and was needed.
- 04-20-95 The Service sent the Corps a letter, superseding the 4/17/95 letter, recommending that a survey be conducted for the northeastern beach tiger beetle.
- 05-15-95 The Service participated in a site visit with the Corps and the applicant.
- 05-26-95 The Service received the Corps' request to initiate formal consultation.

(Cschulz:07/31/95)
(filename:chapplbo)

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)