

November 7, 2005

Mr. Nelson Castellanos
Division Administrator
Federal Highway Administration, Maryland Division
10 South Howard Street
Suite 2450
Baltimore, Maryland 21201

Attn: Caryn Brookman

Re: Section 7 Consultation - U.S. 50 Improvement Project Proposed by the Maryland State Highway Administration, Queen Anne's and Talbot Counties, MD

Dear Mr. Castellanos:

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the above referenced project and its effects on the federally listed endangered Delmarva fox squirrel (*Sciurus niger cinereus*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your request for formal consultation was received on June 13, 2005. The proposed project is described in the "Final Biological Assessment of impacts to the Delmarva Fox Squirrel, US 50 Between US 301 and MD 404, Queen Anne's County, Maryland", received concurrently with your consultation request.

This biological opinion is based on information provided in the Federal Highway Administration's (FHWA) Biological Assessment for this project, field investigations, meetings and discussions with the State Highway Administration, and other sources of information. A complete administrative record of this consultation is on file at the Chesapeake Bay Field Office in Annapolis, Maryland.

I. CONSULTATION HISTORY

The consultation history is provided in Appendix A.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The proposed project includes an approximately 8-mile stretch of US 50 from the US 50/US 301 interchange to MD 404. The proposed project would widen US 50 to six lanes (three in each direction)

with ten-foot outside shoulders. Widening will occur to the outside of the existing roadway. US 50 eastbound will be relocated to the south through an existing agricultural field at MD 456 (Del Rhodes Avenue/Greenspring Road), to avoid impacts to St. Peters Episcopal Church, which is listed on the National Register of Historic Places. The existing eastbound roadway will become the westbound roadway and the new roadway will be constructed as the eastbound movement. In addition, the project includes the closing of several median crossovers and the construction of numerous service roads; these are described in detail in the Biological Assessment. Because of funding constraints, the project is broken into eight phases:

Phase 1: Carmichael Road

Phase 2: Sportsman Neck Road

Phase 3: MD 404

Phase 4: MD 213

Phase 5: MD 18

Phase 6: US 50 Mainline, US 50/301 Interchange to Bloomingdale Road

Phase 7: US 50 Mainline, Bloomingdale Road to MD 213

Phase 8: MD 213 to MD 404.

Preliminary Investigation meetings have been held on the first five phases, but not on Phases 6 through 8.

The USFWS and the applicant, the State Highway Administration (SHA), have agreed that the project as described encompasses the maximum potential impacts from the entire project, including all phases. The assessment of impacts and the appropriate conservation measures needed to off-set these impacts will thus be based on this maximum. If future trapping studies indicate that the impacts are actually less than this maximum amount, the excess off-setting measures can be credited to SHA and may be considered appropriate for other SHA projects in the vicinity.

The proposed project, as described, will result in the clearing of 14.9 acres of Delmarva fox squirrel (DFS) habitat, and the degradation of 54.8 acres of DFS habitat (see Map 1). The DFS habitat to be cleared for the proposed project consists of forested areas dominated by mixed hardwoods, including American beech (*Fagus grandifolia*), various oaks (*Quercus* spp.), tulip poplar (*Liriodendron tulipifera*), red maple (*Acer rubrum*), sweet gum (*Liquidamber styraciflua*), and pines (*Pinus* spp).

For the purposes of this consultation, the action area is considered to be all limits of disturbance for highway improvements, new interchanges, service roads, stormwater management facilities, compensation areas, and areas trapped to date (see Map 1). The action area also includes off-site compensation areas and the two forest stands within Phase 2 of the project that were trapped in 2003. To account for potential indirect effects to Delmarva fox squirrels from new road construction, the action area extends 150 feet beyond the proposed limits of new paving. Where the potential for secondary impacts occur, the action area includes the entire extent of the suitable habitat. These expanded areas occur south of US 50 between MD 18 and Outlet Center Drive, south of US 50 east of Sportsman's Neck Road, and north of US 50 east of Saint Peters Church (see Map 1).

For the long-term protection of the DFS, FHWA and the applicant (SHA) are committed to the implementation of a conservation easement to protect in perpetuity at least 182 acres of mature forested habitat supporting DFS. The FHWA and its consultants have considered several sites, and propose the acquisition and permanent protection of a minimum of 182 acres of suitable DFS habitat within the Wye River watershed near the project area.

STATUS OF THE SPECIES/CRITICAL HABITAT

Species /Critical Habitat Description -- Delmarva fox squirrels are large, heavy-bodied tree squirrels with full, fluffy tails. The DFS is a subspecies of fox squirrel (*Sciurus niger*), a species found throughout the eastern United States. The DFS resembles the gray squirrel (*Sciurus carolinensis*), however, gray squirrels are smaller, their tails are not as full, and their dorsal area is not as uniformly colored as DFS. Fox squirrels are more cursorial, less agile, slower, and more deliberate in their movements than are gray squirrels (Dozier and Hall 1944). When a fox squirrel moves from one tree to another, it usually descends to the ground rather than leaping from tree to tree as do gray squirrels.

In 1967, the DFS was listed as a federally endangered species due primarily to its disappearance from 90% of its former range. The dramatic decrease of this species is attributed to habitat loss resulting from forest clearing and changing land use patterns throughout its range (Taylor 1973), and possible over-hunting in the past. No critical habitat has been designated for this species.

Life History of the Species -- The Delmarva fox squirrel inhabits mature hardwood and mixed pine forests in the agricultural landscapes of the Delmarva Peninsula. Suitable DFS habitat consists of large (greater than 12" dbh) hard and soft mast producing trees such as oak (*Quercus* spp.), hickory (*Carya* spp.), beech, and pine (*Pinus* spp.) (Taylor 1976). Generally, DFS prefer forest stands with large trees, an expansive canopy, and sparse understory (Taylor 1976, Dueser *et al.* 1988, Paglione 1996). The large (mature) trees provide sites for cavity and leaf nests as well as mast, while the sparse understory is thought to enhance DFS foraging efficiency. Forest edge habitat is used extensively by DFS (Taylor 1976, Flyger and Smith 1980, and Paglione 1996) and the association of agricultural fields with forest edge may play an important role in the suitability of habitat for DFS. Agricultural crops such as corn, wheat, soybeans, oats, and other crops are readily used by DFS to supplement their diet when available (Allen 1943, Brown and Yeager 1945, Bakken 1952, Taylor 1976, Paglione 1996).

Delmarva fox squirrels use tree cavities (Allen 1952, Nixon and Hansen 1987) to provide maximum safety for young (nesting) and protection from cold and wet weather (shelter). They also construct nests of leaves and twigs (Dozier and Hall 1944, Allen 1952) which may vary from small day shelters and feeding platforms to large, well insulated rearing nests (Weigl *et al.* 1989). Nests are generally found in crotches of tree trunks, in tangles of vines, on a trunk, or situated towards the ends of larger branches (B.J. Larson, Chincoteague National Wildlife Refuge, pers. comm.).

Most mating occurs in late winter and early spring (Lustig and Flyger 1976). Gestation lasts approximately 44 days (Asdell 1964) and most young are born in February, March, and April. There is a smaller breeding period and birth peak in July and August. Litter size is one to six (mean: 4 (Dozier and Hall 1944); mean: 2.25 (Lustig and Flyger 1976); mean: 1.7 (Larson 1990)). Young are dependent on their mothers for approximately 3 months (Moore 1957). To protect breeding squirrels and their young, the recommended time of year restrictions for habitat disturbance are from January 1 through May 15, and July 1 through September 15.

Diets of southeastern fox squirrels (*Sciurus niger niger*) and Delmarva fox squirrels include mast from a variety of trees, pine buds, staminate cones, pine seeds, berries, fungi, and insects (Moore 1957, Ha 1983, Weigl *et al.* 1989, Larson 1990, Humphrey and Jodice 1992). During much of the year, mast from mature trees (primarily from oak, hickory, beech, walnut) is a primary component of the fox squirrel diet (Weigl *et al.* 1989). During the spring, DFS feed extensively on tree buds and flowers, and will consume large

quantities of fungi, insects, fruit, seeds, and occasionally bird eggs and young (USFWS 1983). At Chincoteague National Wildlife Refuge (CHNWR), Larson (1990) found that DFS switched from reliance on pine and oak mast in the fall/early winter to heavy use of soft mast hardwoods (primarily maple) in the late winter and spring months. Like other southeastern fox squirrels, DFS feed largely on mature green pine cones during late summer and early fall until acorns and other hard mast become available in the fall (Moore 1957, Ha 1983, Weigl *et al.* 1989, Kantola and Humphrey 1990, Larson 1990). By late summer, DFS are often in poor condition due to low food availability in the spring and early summer (Kantola 1986, Weigl *et al.* 1989, Larson 1990). Further, although pine-seed crops are subject to failure, the magnitude of their year-to-year variation is not as great as acorn crops. Thus, pine seeds may be particularly important to squirrels during years of acorn mast failure (Kantola and Humphrey 1990).

Home range sizes for the DFS are related to habitat type, and variation within the subspecies is substantial. Flyger and Smith (1980) estimated mean home range size for DFS in an agricultural landscape (described as "a mixture of woodland and fields of corn or soybeans with narrow wooded strips 20-25 m wide between fields" with relatively open understory) as 30 ha, while home range for the CHNWR population varies from 1.4 to 12.8 ha, with a mean of 4.1 ha (Larson 1990). Home ranges also vary by season and sex of the animal. Male home ranges are usually larger (average 5.88 - 28.47 ha varying on location and season) than females (4.5 to 13.62 ha) (Paglione 1996). This sex variation was especially pronounced in spring and early summer periods. Similar sexual differences in DFS home ranges were also found at CHNWR, with an average of 2.08 ha for females and 5.45 ha for males (Pednault-Willett 2002).

Home range sizes of other southeastern fox squirrels range from 9 to 19 ha for females and 20-32 ha for males (Hilliard 1979, Edwards 1986, Weigl *et al.* 1989, Kantola and Humphrey 1990). Average home ranges of southeastern fox squirrels are generally larger (>15 hectares; Hilliard 1979, Edwards 1986, Weigl *et al.* 1989) than those of midwestern fox squirrels (5 ha or less; Ha 1983). In general, this larger home range has been considered an adaptation to patchy landscapes (Ha 1983, Mace and Harvey 1983), and unpredictable seasonal food supply found in southeastern forests (Ha 1983, Weigl *et al.* 1989, Paglione 1996). Weigl *et al.* (1989) found that food supplies had the greatest influence on the ecology of southeastern fox squirrels, often affecting the size and location of their home range. Patterns of use within the home range have received relatively little study (Loeb and Moncrief 1993). However, Steele (1988) found that fox squirrels in North Carolina used much of their home range in July, but in August space use was reduced by more than 50% as squirrels began to feed extensively in selected longleaf pine trees.

Density estimates for the DFS include 0.7-0.98 DFS/ha at the CHNWR (Pednault-Willett 2002) and a range of 0.36 DFS/ha to 1.29 DFS/ha (Paglione 1996) from two sites at Blackwater National Wildlife Refuge. The high density at the Blackwater NWR site was attributed to the presence of "exceptional habitat composed of large mature pines and mixed hardwoods, with a clear understory and adjacent agricultural fields" (Paglione 1996). Density estimates for other southeastern fox squirrels vary from 8.4 squirrels/km² (0.08 squirrels/ha, Humphrey *et al.* 1985), 15.3-17.71 squirrels/km² (0.15-0.18 squirrels/ha, Tappe 1991), to 20.0 squirrels/km² (0.20 squirrels/ha, Hilliard 1979). Weigl *et al.* (1989) reported a mean density of 0.05 fox squirrels/ha (highest annual density of 0.35/ha) in North Carolina; they inferred from the low densities generally exhibited by southeastern fox squirrels, that preservation of large habitat blocks would be necessary to support viable populations. Gray squirrels, potential competitors with fox squirrels, can reach densities of 15/ha (Gurnell 1983).

Distribution and Status -- Historically, DFS were distributed throughout the Delmarva Peninsula and into southeastern Pennsylvania and southern New Jersey (Taylor 1976). At the time of listing, in 1967, the range had decreased to only 10% of its original size on the Delmarva Peninsula and populations occurred in only four Maryland counties: Kent, Queen Anne's, Talbot, and Dorchester. Today, populations continue in those counties but populations are also known to occur in Caroline County, Maryland and western Sussex County, Delaware (USFWS 2003) and within all these counties, the size of the distribution has increased. Translocations have figured prominently in the recovery program. Delmarva fox squirrels have been successfully reintroduced to 11 sites within their historical range in Maryland, Delaware, and Virginia, and now occupy a total of approximately 127,000 acres of occupied habitat.

The Delmarva fox squirrel range is thus considered to be expanding. The increasing size of the species' distribution, both the remnant portions and the portions established through translocations, indicate the species occupies a greater geographic area and occurs in a larger number of sites than at the time of listing. Monitoring of seven benchmark sites, where local populations were monitored within the existing range, indicates that populations within the range are generally stable (Dueser 1999, USFWS 2003). Comparisons of landowner surveys made in 1972 and 1985 also suggest a stable trend in populations within its range. Of 54 sites originally surveyed, one previously unoccupied site gained DFS and one previously occupied site lost DFS (Therres and Willey 1988). However, the original landowner survey did not include areas where the USFWS has documented new populations of DFS. Based on the expanded range and evidence of stable populations within its range, we consider the status of the Delmarva fox squirrel to be increasing.

Threats to the Species -- Timber harvest, short-rotation pine forestry, and forest conversion to agriculture and/or structural development (housing, roads, and industry) constitute threats to the DFS and their habitats. The following information concerning these and other threats is taken from the DFS Recovery Plan (USFWS 1993) and the Status and Recovery Plan Update (USFWS 2003).

The human population within DFS historical range has increased significantly in recent years and this has resulted in corresponding increases in developed land and losses of agricultural and forest land. From 1985 to 1997, in the three counties where DFS are most abundant (Queen Anne's, Talbot and Dorchester), there has been an average annual increase in 1,078 acres/year of developed land. There has been a corresponding average annual loss of 343 acres of forest and 621 acres of agricultural land per year between 1985 and 1997 (Weller and Edwards 2001). Forest acres lost to development are permanent losses for the Delmarva fox squirrel.

The acreage of timber harvest on the Delmarva fluctuates from year to year but the average of six years of data in Dorchester County was 3,558 acres per year (USFWS 2003). The acres of timberland and DFS habitat that are present in any one year are not precisely measured and a better understanding or whether this rate of harvest is sustainable is needed. The acreage in short-rotation pine plantations is not well quantified, however, 58,000 acres of timber land, previously owned and managed by the pulp industry, have recently been donated to the State of Maryland to be managed in the future as sawtimber. This will enable DFS habitat to be established on land where frequent cutting previously prevented the growth of mature timber.

Forest pest infestations, including gypsy moths (*Lymantria dispar*) and southern pine beetles (*Dendroctonus frontalis*), also constitute a threat to DFS habitat because diseased trees die or are removed. Outbreaks tend to be localized but they can exacerbate losses of forest land.

Accidental DFS mortality is most frequently attributed to being struck by automobiles and to a limited extent by hunters who mistake DFS for gray squirrels. Although unsubstantiated, over hunting of DFS is thought to have contributed to past declines. Illegal hunting is not considered a threat at this time.

Recovery Goals and Objectives -- The following provides information on the current recovery goals and objectives for downlisting or delisting the species that are outlined in both the DFS Recovery Plan (USFWS 1993) and the DFS Status and Recovery Plan Update (USFWS 2003).

For the reclassification of the DFS from endangered to threatened, ecological requirements and distribution within the natural range must be fully understood, the seven benchmark populations must be stable or expanding for at least five years and ten new colonies must be established within the historical range. The DFS will be considered for delisting when (besides having met the reclassification criteria) the following elements have been achieved: (1) five post-1990 colonies are established outside the remaining natural range, (2) periodic monitoring shows that 80% of translocated populations have persisted over the full period of recovery, and at least 75% of these populations are not declining, (3) mechanisms that ensure perpetuation of suitable habitat at a level sufficient to allow desired distribution is in place within all counties in which the species occurs and (4) mechanisms are in place to ensure protection and monitoring of new populations, to allow for expansion, and to provide inter-population corridors to permit gene flow among populations (USFWS 1993).

The previous biological opinions completed for this species are provided in Appendix B.

ENVIRONMENTAL BASELINE

Status of Species in Action Area -- Delmarva fox squirrels occupy at least 6,660 acres of forested habitat in Queen Anne's County (USFWS 2003). Occupied Delmarva fox squirrel habitat has been identified along the south side of US 50 from the easternmost project limits of Segment 2 (see Map 2) to the US 50/US 301 interchange. The woods south of US 50 and east of Sportsman Neck Road are also considered to support a known occurrence of Delmarva fox squirrel. Another area within the project corridor where occupied DFS habitat occurs is between Arrington Road and MD 662 along the south side of US 50. In addition, two dead Delmarva fox squirrels have been documented on US 50 where a tributary of the Wye East River crosses US 50 just west of the US 50/Arrington Road intersection. There are numerous records of DFS occurrence south of US 50, but few records of DFS occupied areas north of US 50.

To determine actual distribution of DFS in the forest tracts to be impacted by this project, the USFWS and SHA have agreed that areas within the action area that contain potential DFS habitat can be trapped prior to the commencement of a given phase to determine if DFS are present. Negative trapping results will be valid for 3 to 5 years, depending upon the distance of the trapped site from other documented DFS observations. To date, SHA has contracted with David R. Smith of Coastal Resources, Inc., to conduct DFS surveys within 2 forest stands located in Phase 2 of the project area (Map 3). The results of the surveys, performed in Spring and Fall 2003, indicated there was an absence of DFS within the two forested tracts. Therefore, the USFWS will consider these tracts to be unoccupied for the subsequent 3-5 years.

EFFECTS OF THE ACTION

Direct Effects

The project's direct effects result from the permanent clearing of 14.9 acres of DFS habitat, and the noise and disturbance associated with this action. This clearing will occur in phases (1-8), as outlined in Appendix C. All forested areas with characteristics consistent with DFS habitat will be assumed occupied for this analysis. Impacts to the DFS associated with the clearing operation may result from direct mortality of individual DFS, and harm and harassment resulting in either individual take or population declines due to diminishing habitat quantity and quality. Adverse effects on DFS are expected to result from take occurring during habitat removal and from the loss of valuable habitat following clearing. Direct mortality of individuals could be greatly reduced if clearing occurs outside the breeding season, when natal squirrels are particularly vulnerable.

Habitat losses caused by highway construction are usually permanent and have effects that can result in take. Adverse effects result from increased predation, increased intra- and inter-specific competition, reduced ability to disperse, intensified consequences of catastrophic events (e.g. drought, flooding, ice storms, fire, disease), decreased reproductive success, and decreased carrying capacity because of decreased availability of nesting and shelter sites and food.

In addition, adults and young may temporarily avoid use of habitat adjacent to clearing sites because of noise and disturbance. This may result in decreased survival and reproductive success through decreased availability of shelter sites and food.

The proposed project will contribute to loss of habitat supporting DFS nesting and foraging by clearing 14.9 acres of forested DFS habitat. However, this loss (as well as the degradation described in the following section), will be offset by the placement of at least 182 acres of occupied forested habitat off-site in perpetual conservation easements to protect habitat features of value to DFS.

Indirect Effects

Degradation of habitat within 150 feet of roads --The project's principal indirect effect will occur on 54.8 acres between the limits of clearing and within 150 feet of newly paved road surfaces where suitable Delmarva fox squirrel habitat occurs. DFS occupying habitat close to roads (within 150 feet) are more likely to be hit by vehicles on the roads and thus have a lower survival rate. Thus habitat within 150 feet of roads is considered degraded because of this reduced survivorship of DFS living near roads. We anticipate that even though the 54.8 acres of degraded habitat will continue to be present (i.e. will not be cleared), the use of these acres by DFS will greatly diminish, or the survivorship of DFS in these areas will be very poor.

Increased Physical Barriers to Dispersal and Mobility -- Roads or other physical barriers such as houses, waterways, fences, and walls may impair the mobility of DFS and make them more susceptible to direct take (mortality) due to predation or reduced access to food and water (Taylor 1976, Poole 1993, Paglione 1996). Lack of ability to disperse may lead DFS populations to exceed the carrying capacity of the available habitat, resulting in intensified intra-specific competition and a decline in general fitness and reproductive rates. Also, small isolated populations, can not be replenished by dispersing individuals from other populations and thus have a greater risk of extirpation (local extinction). The significance of the US 50 project corridor as a barrier to dispersal is currently unknown. The several roadkills that have

been recorded along the project area in recent years (1999, 2003, 2004) indicates that DFS do attempt to cross US 50; though records of successful crossings are not as easily perceived. Though the widening of US 50 or the addition of interchanges will increase this potential physical barrier, there is no way to be able to meaningfully measure, detect, or evaluate this effect.

Enhancement of Development Along Frontage Roads -- Indirect effects of this project include secondary impacts from development projects that could be stimulated by the availability of service roads with uncontrolled access. The areal extent of this type of impact is too uncertain to be quantified; however, we do know the location where these impacts would be most severe. The service road proposed in Phase 2 (Sportsmen's Neck Road) cuts through currently occupied habitat and subsequent development along the service road would further clear or degrade habitat. To address this effect, we have included term and condition 5 (see below) requiring that acquisition of a conservation easement on the occupied habitat south of the Sportsmen's Neck service road should be made the top priority for compensatory habitat protection (see Map 4).

Cumulative Effects -- Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area. Future federal actions that are unrelated to the proposed action are not considered in this biological opinion because they require separate consultation pursuant to section 7 of the ESA. While most of the action area is zoned for agriculture, there are portions of the action area that have been designated as growth areas or priority funding areas where development is reasonably certain to occur. Build out of these designated growth areas would result in cumulative effects to the Delmarva fox squirrel from loss of suitable habitat area and further isolation of populations. One of the designated growth areas is in the Wye Mills area, west of Route 50 and between MD 213 and MD 404. The additional build out of these areas may isolate populations bounded by this area and the Wye East River.

CONCLUSION

Regulations implementing Section 7(a)(2) of the ESA (50 CFR 402) require the Service to formulate its biological opinion as to whether a Federal action that is the subject of consultation, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species or the adverse modification of critical habitat. "Jeopardize the continued existence of" is defined by this regulation as "to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species."

The Delmarva fox squirrel's current range encompasses 127,000 acres across eight counties in Maryland, and one county each in Delaware and Virginia (USFWS 2003). However, the large majority of DFS sites occur in the tri-county area of Queen Annes, Talbot, and Dorchester County, Maryland (USFWS 2003). Since 1999, this is the 13th non-jeopardy biological opinion to be completed anticipating take of the Delmarva fox squirrel from commercial and residential development activities (Appendix B). The 12 previous biological opinions anticipated approximately 122 acres of impacts that included permanent removal of DFS habitat and/or long-term degradation of habitat from roads or use of erected structures (human activity). However, these projects also provided approximately 320 acres of permanent protection of DFS habitat in the vicinity of the projects to offset these habitat losses.

The impacts associated with the proposed project were evaluated within the context of the following: the large amount of remaining suitable habitat (USFWS 2003), the relatively stable trend of DFS across their

known range (USFWS 2003), the terms and conditions provided in past biological opinions that reduce the amount of take, and the fact that the DFS habitat to be lost or degraded as a result of this project represents less than 1% of Delmarva fox squirrel habitat in Maryland. After consideration of the current status of the species throughout its range and in the action area, the environmental baseline for the action area, the effects of this project and cumulative effects, the Service concludes that approval and funding of this project, as proposed, is not likely to jeopardize the continued existence of the DFS. 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 Endangered Species Act 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 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 to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or seeking shelter. Incidental take is any take of listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the 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 expects incidental take of Delmarva fox squirrels as a result of this project's direct and indirect impacts will be difficult to detect, as the behavioral patterns that will inexorably be impaired or disrupted (breeding, feeding, or sheltering) would require extensive and consistent surveys to observe, and injured or killed individuals will be difficult to locate due to their small size, cryptic nature, and vagility. The Service anticipates that incidental take of DFS will occur as the result of clearing forested habitat and degrading habitat within 150 feet of newly paved road, and in other habitat patches isolated by the new roadways, and will be in the form of direct mortality of young during clearing, and harassment or harm to adults and young resulting from loss of den sites and escape cover. The proposed project will result in the permanent loss of approximately 14.9 acres of DFS habitat, and the degradation of 54.8 acres of DFS habitat.

Although the number of individual DFS to be taken is not quantifiable based on existing information, take of this species can be anticipated by the areal extent of the habitat affected. Acres of habitat lost through direct and indirect impacts will be the index measured to monitor incidental take of this species, and is not expected to exceed 14.9 acres of clearing, and 54.8 acres of degradation.

REASONABLE AND PRUDENT MEASURES

The measures described below are nondiscretionary, and must be implemented by the FHWA as specified by the Terms and Conditions below so that they become binding conditions of their project approval or project agreement with SHA, in order for the exemption in Section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to require the applicants to adhere to the terms and conditions of the incidental take statement through

enforceable terms, 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. The Service considers the following reasonable and prudent measures to be necessary and appropriate to minimize take of DFS:

- (1) Cutting and clearing of trees must be conducted outside the primary DFS breeding season to minimize mortality to females and young.
- (2) Conservation easements for permanent protection of the off-site DFS conservation areas must be finalized prior to initiation of any forest clearing activities in DFS habitat.
- (3) Protection from development of DFS habitat adjacent to the interchange in Phase 2 must be a top priority to compensate for impacts of this project.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA and applicant must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

- (1) Tree cutting and clearing shall not be conducted during the primary DFS breeding season (January 1 through May 15); if possible the secondary breeding season (July 1 through September 15) will also be avoided.
- (2) Prior to timber cutting or clearing of trees in DFS habitat, SHA shall finalize a conservation easement, or similar document acceptable to the Service, that shall provide legally and financially binding assurances that at least 182 acres of off-site wooded DFS habitat will remain available in perpetuity as habitat for DFS. The precise acreage will depend on the site(s) chosen, but note condition 5 below. This action will be assured by recording the conservation easements designating the protection of the habitat for the DFS in the record of deeds at the Queen Anne's County Lands Records Office/Courthouse in Centreville, Maryland, or similar assurances acceptable by the Service.
- (3) The deeds and associated conservation easements will address appropriate forest management practices that will maintain the suitability of the required acreage of DFS habitat, restrictions on development or placement of structures, restrictions on squirrel hunting, and any other measures necessary to provide and maintain habitat for DFS in perpetuity at the off-site conservation area(s). Language for the conservation easement will be submitted to and approved by the Service before being filed. The Service must approve any changes to the terms of the conservation easement.
- (4) The FHWA shall take all necessary measures, including the incorporation of special assurance requirements in their agreement with SHA, to insure the permanent availability of the 182 acres of wooded DFS conservation habitat referred to above, and in the project description.
- (5) The FHWA/SHA will make acquisition of a conservation easement for the occupied habitat east of Sportsmen's Neck Road and south of the new access road the top priority location for their compensatory habitat protection measures.

Reporting Requirements

- The applicants shall notify the Service upon start-up and completion of project construction at the address given below:

Chesapeake Bay Field Office
U.S. Fish and Wildlife Service
177 Admiral Cochrane Drive
Annapolis, MD 21401
Phone (410) 573-4537

- Upon locating a dead, injured, or sick DFS, notification must be made to nearest USFWS Law Enforcement Office at:

Division of Law Enforcement
U.S. Fish and Wildlife Service
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
Phone (410) 573-4514

Care should be taken in handling sick or injured individuals and in the preservation of specimens in the best possible state for later analysis of cause of death or injury.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The Service understands that no more than 14.9 acres of Delmarva fox squirrel habitat will be lost and 54.8 acres degraded as a result of this project. If, during the course of the action, this level of habitat loss is exceeded, this loss and the associated incidental take represent new information requiring reinitiation of consultation and 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. REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the FHWA request letter dated June 9, 2005, and received June 13, 2005. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary FHWA involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the 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.

For this biological opinion the incidental take would be exceeded when the take exceeds 14.9 acres of clearing and 54.8 acres of degradation of DFS habitat, which is what has been exempted from the prohibitions of section 9 by this opinion. The Service appreciates the cooperation of the FHWA and the

SHA during this consultation. For further coordination please contact Andy Moser of this office at (410) 573-4537.

Sincerely,

John Wolflin
Supervisor

Enclosures

cc: Mike Thabault, Assistant Regional Director, Ecological Services, Hadley, MA
Martin Miller, Chief, Division of Threatened and Endangered Species, Hadley, MA
Donald Sparklin, Assistant Division Chief, SHA, 707 North Calvert Street, Baltimore, MD 21202

LITERATURE CITED

- Adams, C.E. 1973. Population dynamics of fox squirrels, *Sciurus niger*, in selected areas in Seward County, Nebraska. Ph.D. thesis. University of Nebraska, Lincoln, NE. 116 pp.
- Allen, G.M. 1943. Extinct and vanishing mammals of the Western Hemisphere, with marine species of all the oceans. American Committee for International Wild Life Protection, Special Publication 11.
- Allen, J.M. 1952. Gray and fox squirrel management in Indiana. Indiana Department of Conservation, P-R Bulletin 1.
- Asdell, S.A. 1964. Patterns of mammalian reproduction. 2nd Edition. Cornell University Press. 670 pp.
- Bakken, A. 1952. Interrelationships of *Sciurus carolinensis* (Gmelin) and *Sciurus niger* (Linnaeus) in mixed populations. Ph.D. dissertation, University of Wisconsin, Madison
- Brown, L.G. and L.E. Yeager. 1945. Fox squirrels and gray squirrels in Illinois. Illinois Natural History Survey Bulletin. 23:449-536.
- Colin, W.F. 1957. Alabama squirrel investigations 1949-1953. Alabama Department of Conservation, Pittman-Robertson Project Final Report W-25-R. 83 pp.
- Donohoe, R.W. and R.O. Beal. 1972. Squirrel behavior determined by radio-telemetry. Ohio Department of Natural Resources, Ohio Fish and Wildlife Report 2. 20 pp.
- Dozier, H.L. and H.E. Hall. 1944. Observations on the Bryant fox squirrel. *Sciurus niger bryanti* Bailey. Maryland Conservation 21:2-7.
- Dueser, R.D., J.L. Dooley and G.J. Taylor. 1988. Habitat structure, forest composition and landscape dimensions as components of habitat suitability for the Delmarva fox squirrel (*Sciurus niger cinereus*). Pp. 414-421, in Management of amphibians, reptiles and small mammals in North America (R. Szaro, ed.). U.S. Department of Agriculture, Forest Service, Technical Report RM-166.
- Dueser, R.D. 1999. Analysis of Delmarva fox squirrel (*Sciurus niger cinereus*) benchmark population data (1991-1998). Report to USFWS, Chesapeake Bay Field Office, Annapolis, MD. Contract 5141070512A.
- Edwards, J.W., D.C. Gynn, and M.R. Lennartz. 1989. Habitat use by southern fox squirrel in coastal South Carolina. Proceedings Annual Conference of Southeastern Association of Fish and Wildlife Agencies. 43:337-345.
- Edwards, J.W. 1986. Habitat utilization by southern fox squirrel in coastal South Carolina. M.S. thesis, Clemson University, South Carolina. 52 pp.
- Flyger, V. and D.A. Smith. 1980. A comparison of Delmarva fox squirrel and gray squirrel habitats and home range. Transactions of the Northeastern Section of the Wildlife Society. 37:19-22.
- Frieswyk, T.S. And D.M. DiGiovanni. 1988. Forest Statistics for Maryland - 1976 and 1986. USDA Forest Service Resource Bulletin NE-107. Northeastern Forest Experiment Station, Broomhall, PA.
- Golley, F.B. 1962. Mammals of Georgia. University of Georgia Press, Athens.
- Gurnell, J. 1983. Squirrel numbers and the abundance of tree seeds. Mammal Review 13:133-148.
- Ha, J.C. 1983. Food supply and home range in the fox squirrel (*Sciurus niger*). M.S. thesis, Wake Forest University, Winston-Salem, North Carolina. 32 pp.
- Hilliard, T.H. 1979. Radio-telemetry of fox squirrels in the Georgia Coastal Plain. M.S. thesis, University of Georgia, Athens. 102 pp.
- Humphrey, S.R. and P.G.R. Jodice. 1992. Big Cypress fox squirrel. *Sciurus niger avicennia*. Pp. 224-233, in Rare and endangered biota of Florida. Volume I. Mammals (S.R. Humphrey, ed.). University Press of Florida, Gainesville. 392 pp.
- Kantola, A.T. and S.R. Humphrey. 1990. Habitat use by Sherman's fox squirrel (*Sciurus niger shermani*)

- in Florida. *Journal of Mammalogy*. 71:411-419.
- Kantola, A.T. 1986. Fox squirrel home range and mast crops in Florida. M.S. thesis, University of Florida, Gainesville. 67 pp.
- Larson, B.J. 1990. Habitat utilization, population dynamics and long-term viability in an insular population of Delmarva fox squirrels (*Sciurus niger cinereus*). M.S. thesis, University of Virginia. 87 pp.
- Loeb, S.C. and N.D. Moncrief. 1993. The biology of fox squirrels (*Sciurus niger*) in the Southeast: A review. Pgs. 1-19 in *Proceedings of the Second Symposium on Southeastern Fox Squirrels, Sciurus niger* (N.D. Moncrief, J.W. Edwards, P.A. Tappe, eds.). Virginia Museum of Natural History. Special Publication Number 1.
- Lustig, L.W. and V. Flyger. 1976. Observations and suggested management practices for the endangered Delmarva fox squirrel. *Proceedings of the 29th Annual Conference of the Southeastern Association of Game Fish Commissioners* 29:433-440.
- Mace, G.M. and P.H. Harvey. 1983. Energetic constraints on home range size. *American Naturalist* 121:120-132.
- Maryland Office of Planning. 1990. Maryland's land 1973-1990, a changing resource. Baltimore, MD.
- Moore, J.C. 1957. The natural history of the fox squirrel, *Sciurus niger shermani*. *Bulletin of the American Museum of Natural History*. 113:7-71.
- Nixon, C.M. and L.P. Hansen. 1987. Managing forests to maintain populations of gray and fox squirrels. *Illinois Department of Conservation Technical Bulletin*. 5:1-35.
- Paglione, L.J. 1996. Population status and habitat management of Delmarva fox squirrels. M.S. thesis, University of Massachusetts. 98 pp.
- Pednault-Willet, K.D. 2002. Determining the population size and habitat use of the endangered Delmarva fox squirrel (*Sciurus niger cinereus*) following an infestation of the southern pine beetle (*Dendroctonus frontalis*) at Chincoteague National Wildlife Refuge. MS thesis, Univ. of Maryland, Eastern Shore. 160 pp.
- Smith, C.C. and D. Follmer. 1972. Food preferences of squirrels. *Ecology*. 53:82-91.
- Steele, M.A. 1988. Patch use and foraging behavior by the fox squirrel (*Sciurus niger*): tests of theoretical predictions. Ph.D. dissertation, Wake Forest University, Winston-Salem, North Carolina, 220 pp.
- Tappe, P.A. 1991. Capture-recapture methods for estimating southern fox squirrel abundance. Ph.D. dissertation, Clemson University, Clemson, South Carolina. 92 pp.
- Taylor, G.J. 1973. Present status and habitat survey of the Delmarva fox squirrel (*Sciurus niger cinereus*) with a discussion of reasons for its decline. *Proceedings of the Southeastern Association of Game and Fish Commissions*. 27:278-289.
- Taylor, G.J. 1976. Range determination and habitat description of the Delmarva fox squirrel in Maryland. M.S. thesis, University of Maryland, College Park. 76 pp.
- U.S. Fish and Wildlife Service. 1983. Delmarva fox squirrel (*Sciurus niger cinereus*) recovery plan, first revision. Newton Corner, Massachusetts. 49 pp.
- U.S. Fish and Wildlife Service. 1993. Delmarva fox squirrel (*Sciurus niger cinereus*) recovery plan, second revision. Hadley, Massachusetts. 110 pp.
- U.S. Fish and Wildlife Service. 2003. Status and Recovery Plan Update for the Delmarva fox squirrel (*Sciurus niger cinereus*). Hadley, Massachusetts. 36 pp.
- Weigl, P.D., M.A. Steele, L.J. Sherman, J.C. Ha, and T.S. Sharpe. 1989. The ecology of the fox squirrel (*Sciurus niger*) in North Carolina: Implications for survival in the Southeast. *Bulletin of the Tall Timbers Research Station*. 24:1-93.
- Weller, D. and N. Edwards. 2001. Maryland's changing land use: past, present, and future.

Maryland Office of Planning. Baltimore, MD 83 pp.

Appendix A: Consultation History

<u>Date</u>	<u>Description</u>
01/31/2000	Fax from SHA to CBFO Re: information about US50 at Sportsmen Neck Road
07/14/2000	Meeting with CBFO and MD SHA to discuss DFS concerns and Route 50 project
12/15/2000	Letter from CBFO to Mr. Williams, SHA, stating concerns about Sportsmen's Neck area and providing recommendations
02/08/2001	Notes from meeting with CBFO and SHA
02/13/2001	Letter from FHWA to SHA indicating that FHWA will work with SHA and USFWS to resolve issues on fox squirrels
04/08/2002	Field review of US 50 by SHA, CBFO, and FHWA, to identify Delmarva fox squirrel habitat and potential impacts
04/30/2002	Memo from SHA summarizing field review
05/02/2002	Memo from Moser to Ratnaswamy update of project status
09/12/2002	Meeting with SHA, FWHA, and CBFO to discuss and resolve outstanding issues
09/30/2002	Email from Brookman, FWHA to CBFO with final minutes from 9/12 meeting
11/08/2002	Email from FHWA to SHA meeting minutes from October 30, 2002 Field Review of Delmarva fox squirrel habitat. Raises questions regarding the 150' degradation
12/30/2002	SHA memo summarizing meeting with DNR, USFWS, SHA and FWHA on November 6, 2002
01/24/2003	Letter from FHWA to Wolflin, CBFO asking questions about DFS trapping (how long are data valid)
03/06/2003	Letter from CBFO to FHWA answering questions about DFS trapping
03/28/2003	SHA memo summarizing meeting on March 25 regarding DFS trapping
04/09/2003	Letter from FHWA to CBFO proposing to move forward with a Biological Assessment of the whole project and its maximum potential impacts and mitigation for those impacts. If negative trapping data indicate lowered impacts, excess mitigation will be credited to future projects

04/29/2003 Email from Buettner providing update on Delmarva fox squirrel trapping

09/24/2003 SHA to CBFO transmittal of spring trapping report

11/24/2003 SHA to CBFO transmittal of final trapping report (spring and fall)

11/26/2003 SHA to Keller, CBFO, regarding trapping questions

12/22/2003 SHA Minutes of meeting on December 15, 2003 to discuss potential mitigation sites

03/19/2004 Email from Mark Burchick to CBFO describing field notes of visits to potential mitigation sites

03/19/2004 Email from Mark Burchick to CBFO describing River Plantation potential mitigation site

08/11/2004 Letter from CBFO to FHWA responding to their April 9, 2003 letter requesting concurrence with the approach taken by FWHA to deal with DFS trapping and conservation

09/07/2004 Letter from SHA to CBFO transmitting DRAFT Biological Assessment of Route 50 Impacts to DFS

12/13/2004 Letter from CBFO to SHA providing review comments on the draft Biological Assessment

06/09/2005 Letter from FHWA to CBFO initiating formal consultation and transmitting final Biological Assessment

Appendix B: Previous biological opinions completed for Delmarva fox squirrel (*Sciurus niger cinereus*) by the Chesapeake Bay Field Office, indicating the acres impacted (cleared and degraded).

PROJECT ID	COUNTY	STATE	YEAR	Approximate ACRES IMPACTED
<i>HP</i>	<i>Qyeen Anne's</i>	<i>MD</i>	<i>1999</i>	<i>9.5</i>
<i>MP</i>	<i>Dorchester</i>	<i>MD</i>	<i>1999</i>	<i>1.25</i>
<i>FTC</i>	<i>Queen Annes</i>	<i>MD</i>	<i>1999</i>	<i>15</i>
<i>CA</i>	<i>Dorchester</i>	<i>MD</i>	<i>1999</i>	<i>16</i>
<i>BC</i>	<i>Talbot</i>	<i>MD</i>	<i>2000</i>	<i>6.93</i>
<i>IM</i>	<i>Talbot</i>	<i>MD</i>	<i>2000</i>	<i>11.38</i>
<i>BN</i>	<i>Dorchester</i>	<i>MD</i>	<i>2001</i>	<i>13.38</i>
<i>CNWR</i>	<i>Accomack</i>	<i>VA</i>	<i>2001</i>	<i>10.37</i>
<i>SF</i>	<i>Talbot</i>	<i>MD</i>	<i>2004</i>	<i>4.95</i>
<i>SC</i>	<i>Talbot</i>	<i>MD</i>	<i>2004</i>	<i>14.22</i>
<i>EV</i>	<i>Talbot</i>	<i>MD</i>	<i>2005</i>	<i>12.15</i>
<i>EA</i>	<i>Talbot</i>	<i>MD</i>	<i>2005</i>	<i>7</i>
			<i>TOTAL=</i>	<i>122.11 acres</i>
<i>US Route 50 between US 301 and MD 404</i>	<i>Queen Anne's</i>	<i>MD</i>	<i>2005</i>	<i>+69.7 = 191.81 acres</i>

Z/endifed/keller/PROJECTS/route50/BOroute50keller110705blackfinal