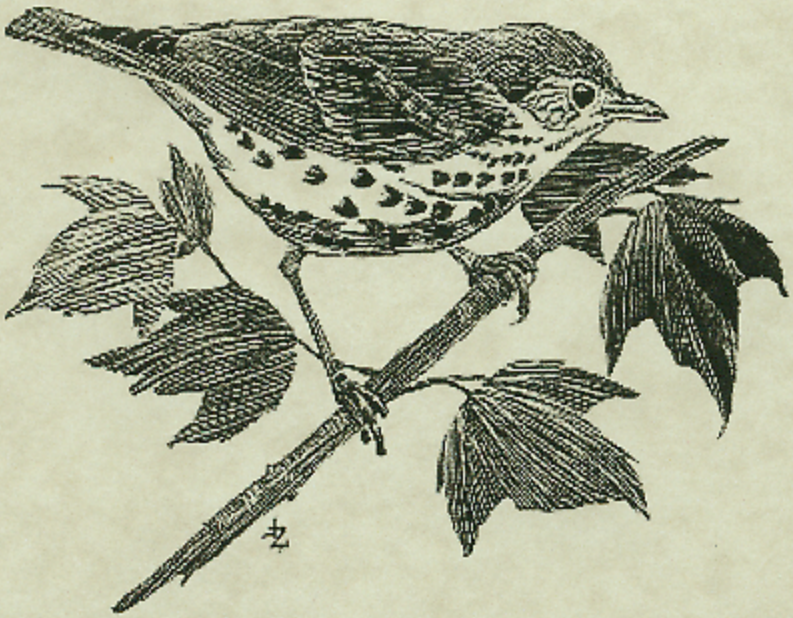
A Guide to the Conservation of Forest Interior Dwelling Birds in the Chesapeake Bay Critical Area



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A GUIDE TO THE CONSERVATION OF FOREST INTERIOR DWELLING BIRDS IN THE CHESAPEAKE BAY CRITICAL AREA

Table of Contents

Executive Summary iii

Introduction 1

What are FIDS?
Recent declines
Factors of declines
What is forest fragmentation?

Forest Fragmentation and FIDS 1

Direct habitat loss 4
Indirect habitat loss or "edge" effects 4
Loss of winter habitat and migratory stopover habitat 5

FIDS as Umbrella Species 6

Critical Area Provisions for FIDS Habitat Protection 7

FIDS Occurring in the Critical Area 9

How to Determine if FIDS Habitat is Present 11

Habitat determination based on forest characteristics 11

Habitat determination based on bird surveys 12

Bird survey methods 12
Interpretation of bird survey data 14

Conservation Guidelines 15

A. Regional and Local Land Use Planning 15
B. Site Design Guidelines 16
C. Mitigation 21

How much mitigation should be required 22
What is acceptable as mitigation? 26

Creation of FIDS habitat through reforestation 27
Protection of existing FIDS habitat 30

References 33

List of Figures

Figure 1: A schematic of land changes between the 1950's and early 1980's near Columbia, MD 2
Figure 2: Graph comparing the probability of occurrence by size of forest habitat 3
Figure 3: Illustrations of selected Site Designs Guidelines 18-19
Figure 4: Edge vs. Interior 20
Figure 5: Comparison of two site design scenarios 24-25
Figure 6: Illustration of selected reforestation guideline 20
Figure 7: Landscape level conservation principles 32

List of Tables

Table 1: List of Forest Interior Dwelling Bird Species that Potentially Breed in the Critical Area 10

List of Appendices

Appendix A: Definitions of breeding status
Appendix B: Flexible ordinance language and development standards
Appendix C: Site Design Guidelines
Appendix D: FIDS Conservation Worksheet
Appendix E: Resources for Locating Mitigation Sites
Appendix F: Conservation Easement Standards
Appendix G: Information Required for Mitigation Site Development Plan

EXECUTIVE SUMMARY

The Chesapeake Bay Critical Area Criteria direct local jurisdictions to develop a management program for the conservation of forest areas used as breeding habitat by forest interior dwelling birds and other wildlife species. This document replaces the first Guidance Paper, approved in 1986, by the Chesapeake Bay Critical Area Commission for the conservation of forest interior dwelling bird (FIDS) habitat. Included in this paper is a description of the legal basis for the protection of FIDS habitat, a clarification of the methods used to identify FIDS habitat, and a list of FIDS species occurring in the Critical Area. Six species have been added to the list in the original document bringing it to a total of twenty-five.

The paper explains the concept of forest edge and forest interior and emphasizes the use of the *Site Design Guidelines* from the original paper to conserve forest interior. The paper also contains a method for determining the amount of mitigation that should be required when unavoidable impacts occur in FIDS habitat. The mitigation amount is based in large part on the extent to which the *Site Design Guidelines* are followed and includes direct and indirect impacts to the habitat. Mitigation will usually be creation of FIDS habitat, but may include, in some cases, protection of existing habitat.

Local and regional planning for FIDS conservation is addressed in addition to the site-specific methods that are stressed.

INTRODUCTION

What are FIDS?

Forest interior dwelling birds (FIDS) require large forest areas to breed successfully and maintain viable populations. This diverse group includes colorful songbirds---tanagers, warblers, vireos---that breed in North America and winter in the Caribbean, Central and South America, as well as residents and short-distance migrants---woodpeckers, hawks, and owls. FIDS are an integral part of Maryland's landscape and natural heritage. They have depended on large forested tracts, including streamside and Bayside forests, for thousands of years.

Recent declines

Although most of these birds are still fairly common, populations of some forest bird species have been declining during the last 30-40 years. According to the Breeding Bird Survey (BBS), a volunteer bird count conducted each June since 1966, there was a 63% decline in occurrence of individual birds of neotropical migrant species (many of which are FIDS) in Maryland between 1980 - 1989. A census of neotropical migrants in Rock Creek Park near Washington, DC from 1948 - 1988 revealed a drastic decline including the total loss of some species within the park. While the forest and park did not change significantly over that 31-year period, the surrounding landscape became much more urbanized and fragmented (Briggs and Criswell, 1978).

Some species, such as the wood thrush and the cerulean warbler, are rapidly declining. According to the BBS, the wood thrush declined almost 2%, while the population decline of cerulean warbler was close to 4% during the period of 1966 - 1998 (US Geological Survey, 1998).

Factors of decline

While many factors have contributed to the decline of FIDS populations, including the loss of habitat on wintering grounds and loss of migratory stopover areas for neotropical migrants, the loss and fragmentation of forests on the breeding grounds here in North America appear to play a critical role. Though some regions appear to be heavily forested today, our forests are increasingly fragmented and altered compared with the forests of the late 1800's and early 1900's. Unlike forest clearing a hundred or so years ago, landscape changes today are more likely to be permanent. This forest fragmentation results in both direct and indirect impacts for FIDS by reducing both the quantity and quality of forest habitat available to FIDS.

Forest Fragmentation and FIDS

Forest fragmentation is the whittling away of forest tracts into increasingly smaller and more isolated patches due to housing and commercial development, roads, logging and agriculture. This effect can be seen in Figure 1, a schematic of actual land use changes that occurred near

Figure 1. Drawing of actual landscape change between 1952 (top) and the early 1980's (bottom) near Columbia, Maryland. (Based on photograph, Robbins et al. 1989.) Adapted with permission from the Wildlife Society.

Columbia, Maryland between the early 50's and the early 80's. While some birds such as northern cardinals and American robins thrive in and around fragmented forests, most FIDS, such as warblers and vireos, require relatively large unbroken forests to live and successfully reproduce.

Forest fragmentation reduces the size of forest patches, reducing the total area of contiguous habitat available to birds and increases the isolation of habitat, reducing the quality of that which remains. Numerous studies have looked at the relationship between forest patch size and isolation and the abundance of bird species present. A study by Robbins et al. (1989) found that the probability of detecting a particular species of forest interior dwelling bird generally increased as the size of the forest increased, whereas the probability of detecting common nonforest bird species associated with more altered and fragmented forest habitat increased as the

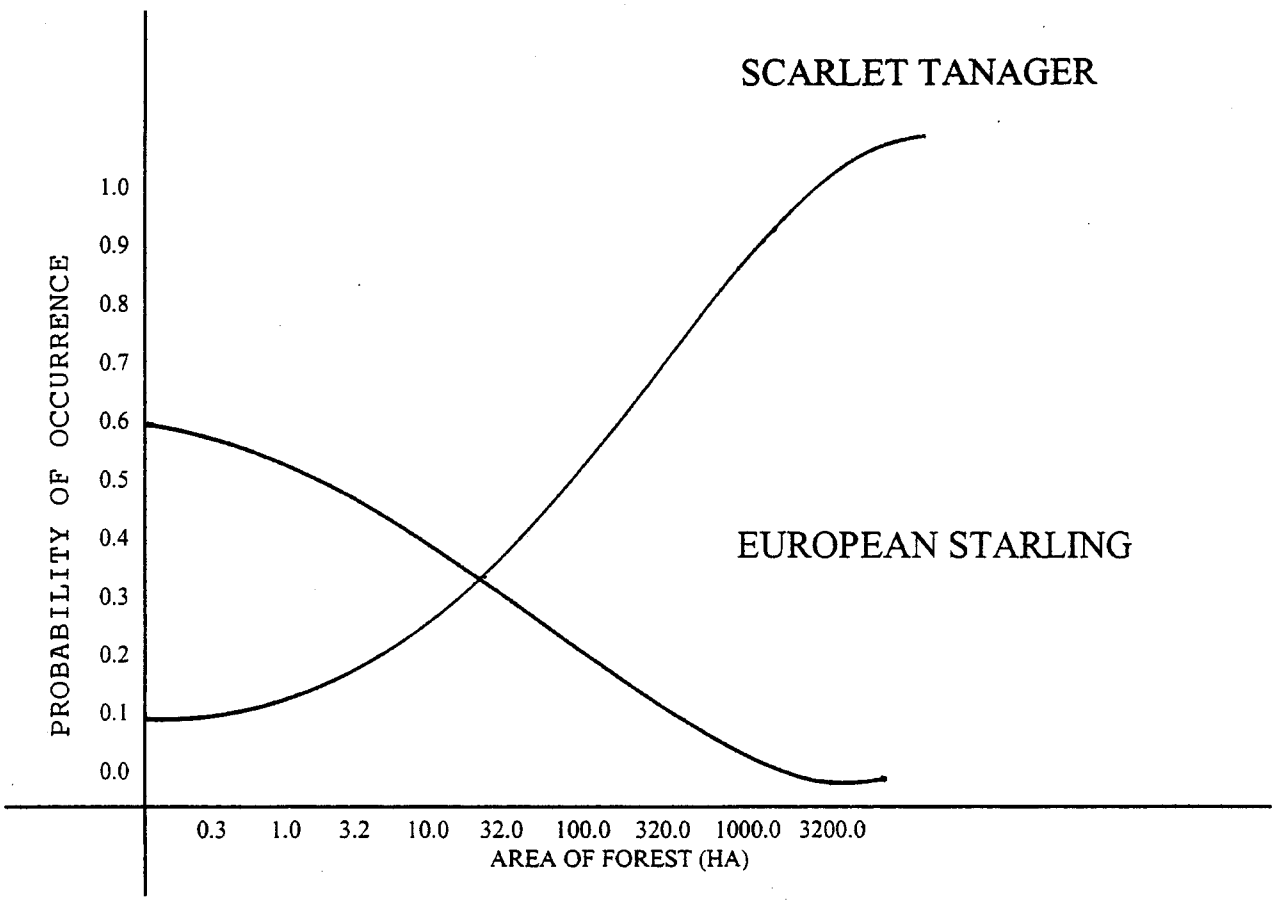


Figure 2. Graph comparing the probability of occurrence by area of forest habitat. Graph shows probability of finding a scarlet tanager (a forest interior dwelling bird species) is higher as the size of forest habitat increases, whereas the probability of finding a European starling (an introduced edge species) decreases as forest size increases. (From Robbins et al., 1989, adapted with permission from the Wildlife Society.)

forest size decreased. This is demonstrated in the species-area curves for the scarlet tanager and the European starling in Figure 2. Forest fragmentation dramatically reduces the diversity of forest bird habitat and forest bird species.

Direct Habitat Loss

The direct loss of forest habitat results in smaller forest tracts that may no longer be adequate to accommodate a bird's territory, to provide an ample supply of food, or to provide the necessary forest structure for breeding. Many forest tracts are too small to support species with large breeding territories such as the red-shouldered hawk, barred owl and pileated woodpecker. For example, a breeding pair of red-shouldered hawks require from 250-625 acres to sustain them. Most FIDS, even those species that have small breeding territories, will only select larger forest tracts for breeding.

In addition to area requirements, many FIDS have additional habitat requirements for nesting. Reduction of forest size often results in the loss of specialized habitats/microhabitats. Small forests cannot sustain the same environmental conditions that larger forests can, such as higher humidity and complex vegetative structure. The vegetative structure (amount of canopy and lower and midstory vegetation) may be missing or inadequate in smaller forests. Younger, less structurally diverse and highly fragmented forests cannot support the same variety of plant and animal species that older, more pristine forests can support.

FIDS are generally more successful at survival and reproduction in large, older, hardwood-dominated forests; however, there has been a loss of quality habitat through the conversion of hardwood and mixed-hardwood forests to pine and the reduction of "old growth" forest to small isolated patches. Prior to European settlement, it is estimated that old-growth forest covered approximately 95% of the Chesapeake watershed (Kraft & Brush, 1981). Forest coverage in Maryland today is about 44% (USDA Forest Service, 1996) and about 40% of the remaining deciduous forest in the East today consists of small, isolated woodlots of relatively immature trees in agricultural and suburban landscapes. When European settlers arrived in eastern North America in the 1600's, the average height of a hardwood tree was 100 feet or more. The average height of trees in the Chesapeake Bay region today is only 60-80 feet (USDA Forest Service, 1996).

Indirect habitat loss or "edge" effects

Edge effects occur when different habitat types are located next to each other. When considering FIDS, we are concerned about the edge effects on forest when it is adjacent to lawn, agricultural fields, or pasture. A variety of edge effects can adversely impact FIDS depending on the size of the forest, adjacent land use, the amount of forest in the landscape, increase in the penetration of light and wind into the forest, encroachment of invasive plants and the presence of other competing or predatory edge species.

Forest "interior" refers to the area in the center of a forest. It is surrounded by "edge". In the Critical Area, the forest area within 300 feet of a forest edge is considered "edge" habitat. "Interior habitat" is commonly defined as the forest area found greater than 300 feet from the forest edge. Interior habitat functions as the highest quality breeding habitat for FIDS. When a forest becomes fragmented, areas that once functioned as interior breeding habitat are converted to edge habitat and are often associated with a significant reduction in the number of young birds that are fledged in a year.

Higher rates of nest predation occur in forest edges. In addition, forest edges provide access to the interior for avian predators such as blue jays, crows, grackles and mammalian predators that include foxes, raccoons, squirrels, dogs and cats. These predators eat eggs and young birds still in the nest. They tend to be abundant near areas of human habitation and can be detrimental to nesting success. For example, domestic house cats are estimated to kill 3-4 million birds each day in the United States.

Neotropical migrants are particularly susceptible to brood parasitism by brown-headed cowbirds. Before the 1900's, the cowbird was largely absent from Eastern forests, occurring primarily in the grasslands west of the Mississippi. Pasture land, agricultural fields and suburban lawns are prime feeding habitat for cowbirds. When these grassy areas are interspersed with fragmented forests, cowbirds can be abundant and have dramatic impacts on the breeding success of FIDS. Cowbirds lay eggs in the nests of a variety of birds and the eggs usually hatch ahead of the host's eggs. The young cowbirds develop rapidly and are usually larger and more aggressive than the host's young, taking more than their share of food and often kicking unhatched eggs and nestlings of the host species out of the nest.

Long-distance migrants are more vulnerable to predation and parasitism than resident birds because of their limited breeding season. The migrant species often only have time to produce one brood once they arrive on the breeding grounds and before the fall migration to the south.

The forest edge is exposed to more light and wind than the interior of the forest resulting in a change in moisture and vegetative composition. Small and fragmented forests tend to be drier and to have less leaf litter. Leaf litter is an important component for maintaining arthropod (i.e., insects, spiders) populations for hungry birds. Neotropical migrants, in general, feed almost exclusively on insects while on their Maryland breeding grounds. In addition, increased densities of deer in many of our forests result in loss of plant diversity and structural diversity from overgrazing on the forest floor and in the midstory. Invasive plants such as Japanese honeysuckle and English ivy encroach into smaller forest fragments, limiting the growth of native plants, stifling natural succession, thereby limiting vegetative and structural diversity.

Loss of winter habitat and migratory stopovers

The decline in neotropical migrant species may be due in part to the loss of forest in their winter habitat in the tropics and along migratory routes. These small birds may travel a distance of one

thousand miles or more over several days to a week. Providing for the needs of these birds, in addition to keeping adequate areas for breeding, also means conserving the native vegetation that provides both the food needed for refueling and cover from predators during migratory stopovers. Removing understory vegetation in our yards and parks eliminates plants that provide crucial food and cover for migrant songbirds. Another concern about neotropical migrants is the large-scale loss of wintering habitat in the tropics, as forest is converted to agricultural fields and pasture.

FIDS as Umbrella Species

Forest birds are valued for their diverse beauty, distinct songs and behavioral characteristics and, for the migrants, the wonder of their seasonal journeys. Over 63 million Americans consider themselves to be birdwatchers. FIDS also act as an "umbrella species" for a wide range of forest benefits. The eastern deciduous forest is more than a group of trees. It is an ecosystem of plants and animals that has evolved over thousands of years. In addition to providing habitat for numerous species of wildlife, forests help to protect our watersheds from pollution and have a major effect on the stability of world climates by absorbing carbon dioxide and releasing oxygen. Diversity in bird species is a good indication of the quality, diversity and benefits found from forest habitat overall.

FIDS are an important component of a natural forest system. They spread seeds through their droppings, help control insect numbers and provide food to those higher on the food chain. The habitat needs of FIDS overlap those of many other plant and animal species including large mammals, many wildflower species, wood frogs and wild turkey. When sufficient habitat is protected to sustain a diversity of forest birds, other important components and microhabitats of the forest will be encompassed and be protected. These include the small, forested streams and headwaters critical for fish populations and the vernal pools necessary for the survival of amphibians.

Forest birds are also an important link in a complex food web. Warblers and other insectivores eat untold numbers of insects such as spruce budworms and caterpillars, helping to keep these defoliators in check (Yahner, 1995). Migratory birds journey north from points far south to breed due in part to the abundance of insects in North America in the spring. Without healthy populations of birds, these insects would consume significantly greater quantities of greenery.

The guidance that follows provides a way for landowners, developers and local governments to conserve this suite of birds and the forests on which they depend.

CRITICAL AREA PROVISIONS FOR FIDS HABITAT PROTECTION

The Chesapeake Bay Critical Area Program was established in 1984 with the passage of the Critical Area Act. The law mandated the development of regulations (Critical Area Criteria) by the Governor-appointed Critical Area Commission. Based on goals set forth by the Act, minimum requirements were developed to protect water quality, conserve plant and wildlife habitat and direct growth and development. These requirements are implemented through 61 county and municipal Critical Area Programs.

One of the requirements of the Criteria is the protection and conservation of breeding habitat for forest interior dwelling birds (FIDS). Specifically, the Criteria instruct local jurisdictions to develop Critical Area Programs to:

> *Protect and conserve those forested areas required to support wildlife species identified above in §C(2)(a)(iii) and (iv)* [these regulations refer to riparian forests and large forest tracts, respectively; see below "What is FIDS habitat"], *by developing management programs which have as their objective, conserving the wildlife that inhabit or use the areas. The programs should assure that development activities, or the clearing or cutting of trees which might occur in the areas, is conducted so as to conserve riparian habitat, forest interior wildlife species and their habitat. Management measures may include incorporating appropriate wildlife protection elements into forest management plans and cluster zoning or other site design criteria which provide for the conservation of wildlife habitat. Measures may also include soil conservation plans that have wildlife protection provisions appropriate to the area defined above and incentive programs which use the acquisition of easements and other similar techniques [COMAR 27.01.09.04C(2) (b)(iv)].*

The Criteria identify two FIDS habitat types for which conservation is mandated:

> *(1) Existing riparian forests (for example, those relatively mature forests of at least 300 feet in width which occur adjacent to streams, wetlands, or the Bay shoreline, which are documented breeding areas) [COMAR 27.01.09.04C(2)(a)(iii)];*
>
> *(2) Forest areas utilized as breeding areas by forest interior dwelling birds and other wildlife species (for example, relatively mature forested areas within the Critical Area of 100 acres or more, or forest connected with these areas) [COMAR 27.01.09.04C(2)(a)(iv)].*

Both definitions give <u>examples</u> of habitat sizes: riparian forests 300 feet or wider, forest tracts 100 acres or larger. Smaller forested areas may support FIDS depending on the characteristics of the forest tract and surrounding landscape and FIDS habitat may be absent in forests larger than 100 acres. Therefore, in addition to considering the acreage of a forest when identifying potential FIDS habitat, forest characteristics like forest age, shape, forest edge-to-area ratio, vegetative structure and composition, topography and degree of human disturbance should be

taken into consideration as well as the character of the surrounding landscape, including proximity to large forested areas, percent of contiguous forest in surrounding area, habitat quality of nearby forest tracts and adjacent land uses.

The following steps are recommended for local jurisdictions to develop, adopt and implement a FIDS protection element into their Critical Area Program:

1. Identify forest areas that are potentially viable breeding habitat for FIDS.

2. Incorporate FIDS habitat and forest protection into long-term planning efforts.

    - identify growth areas outside of large contiguous forested areas
    - evaluate zoning of forested areas during comprehensive planning
    - identify opportunities for conservation and protection of forest (i.e., Rural Legacy, public lands)

3. Incorporate FIDS habitat and forest protection into subdivision and zoning ordinances and site plan review.

    - adopt conservation site design standards into zoning and subdivision ordinances including provisions for mitigation when impacts are unavoidable.

FIDS OCCURRING IN THE CRITICAL AREA

Twenty-five species of Forest Interior Dwelling Birds potentially breed in the Critical Area (Table 1; Stewart and Robbins,1958, Iliff et al., 1996, Robbins and Blom, 1996). The majority are small songbirds such as warblers, vireos and flycatchers. Others include the Barred Owl, Whip-poor-will and several hawk and woodpecker species. Twenty of the 25 species are neotropical migrants that nest in temperate North America in the spring and summer and winter in Central and South America.

Although each species is associated with a particular set of forest conditions, all require relatively large, unfragmented forest blocks located within heavily forested landscapes or regions to successfully breed and maintain viable populations. Thirteen of the 25 species are *highly area-sensitive,* seldomly occurring in small, heavily disturbed or fragmented forests. Highly area-sensitive species are most vulnerable to forest loss, fragmentation and habitat degradation. They are generally rare or uncommon on the Maryland Coastal Plain and have highly specialized breeding habitat requirements. The presence of one highly area-sensitive bird species nesting in a forest during the breeding season is an indicator of high-quality FIDS habitat. A forest that supports populations of six or more of these species is considered exceptional habitat. Few such forests remain in eastern Maryland. The remaining 12 species exhibit less area-sensitivity, but require relatively large contiguous forests to maintain stable populations. A forest containing less than 4 of these 12 species is an indication of severe forest fragmentation and thus, marginal or low quality habitat. These forests may present opportunities for habitat restoration or enhancement. Where there is permanent fragmentation and there is no potential FIDS habitat, FIDS conservation is not required.

This edition of the guidance paper includes six additional revisions to the species list. Additions include broad-winged hawk, brown creeper, veery, black-throated green warbler, cerulean warbler. These species are widely recognized as FIDS and are included on the list because of recent documentation that these species breed on the Maryland Coastal Plain (Robbins and Blom, 1996). All five species are rare breeders on the Maryland Coastal Plain and, with the exception of veery, are highly area-sensitive. The presence of these species holding territory during the breeding season is an indication of high quality FIDS habitat.

A sixth addition to the species list is the wood thrush. Although it breeds Statewide, the wood thrush is experiencing significant population declines in Maryland and throughout much of its breeding range in eastern North America. It is negatively impacted by forest fragmentation and maintenance of viable populations requires large contiguous blocks of mature deciduous or mixed deciduous-conifer forest. One additional revision involves a change in the area-sensitivity designation for black-and-white warblers to "*highly area-sensitive*".

Table 1. List of Forest Interior Dwelling Bird species (FIDS) that potentially breed[a] in the Critical Area.

Common Name	Scientific Name	Safe Date[b]	Migratory Class[c]
Red-shouldered Hawk[d]	*Buteo lineatus*	May 1 - Aug 31	Temperate
Broad-winged Hawk[d]	*Buteo platypterus*	June 5 - Aug 10	Neotropical
Barred Owl[d]	*Strix varia*	Jan 15 - Aug 31	Nonmigratory
Whip-poor-will	*Caprimulgus vociferus*	May 10 - July 15	Neotropical
Hairy Woodpecker	*Picoides villosus*	Mar 15 - Aug 31	Nonmigratory
Pileated Woodpecker	*Dryocopus pileatus*	Mar 15 - Aug 31	Nonmigratory
Acadian Flycatcher	*Empidonax virescens*	May 25 - Aug 5	Neotropical
Brown Creeper[d]	*Certhia americana*	May 15 - Aug 31	Temperate
Veery	*Catharus fuscescens*	June 10 - Aug 31	Neotropical
Wood Thrush	*Hylocichla mustelina*	May 25 - Aug 20	Neotropical
Yellow-throated Vireo	*Vireo flavifrons*	May 25 - Aug 15	Neotropical
Red-eyed Vireo	*Vireo olivaceus*	June 1 - July 31	Neotropical
Northern Parula	*Parula americana*	June 1 - Aug 15	Neotropical
Black-throated Green Warbler[d]	*Dendroica virens waynei*	June 10 - Aug 5	Neotropical
Cerulean Warbler[d]	*Dendroica cerulea*	May 25 - Aug 5	Neotropical
Black-and-white Warbler[d]	*Mniotilta varia*	May 15 - July 25	Neotropical
American Redstart[d]	*Setophaga ruticilla*	June 10 - July 20	Neotropical
Prothonotary Warbler	*Protonotaria citrea*	May 10 - July 20	Neotropical
Worm-eating Warbler[d]	*Helmitheros vermivorus*	May 20 - July 20	Neotropical
Swainson's Warbler[d, e]	*Limnothlypis swainsonii*	April 20 - Aug 31	Neotropical
Ovenbird	*Seiurus aurocapillus*	May 20 - Aug 5	Neotropical
Louisiana Waterthrush[d]	*Seiurus motacilla*	May 1 - July 10	Neotropical
Kentucky Warbler[d]	*Oporornis formosus*	May 25 - July 15	Neotropical
Hooded Warbler[d]	*Wilsonia citrina*	May 25 - July 25	Neotropical
Scarlet Tanager	*Piranga olivacea*	May 25 - Aug 10	Neotropical

a Documentation of breeding evidence based on Stewart and Robbins (1958), Iliff et al. (1996), and Robbins and Blom (1996).
b Safe dates, as listed in Robbins and Blom (1996), indicate the time of year when a species can be assumed to occupy a breeding territory.
c Migratory classes: "neotropical" migrant - breeds in temperate North America and winters primarily in Central and South America; "temperate" migrant - breeds and winters primarily in temperate North America; "nonmigratory" - year-round resident with no migratory movements.
d These species are highly area-sensitive and most vulnerable to forest loss, fragmentation and overall habitat degradation.
e State-listed as Endangered.

HOW TO DETERMINE IF FIDS HABITAT IS PRESENT

The Critical Area Commission has determined that the presence of FIDS habitat, as used in the Criteria, should be based on the overall quality of FIDS habitat in a forested area. Accordingly, two methods may be used to determine if FIDS habitat is present. The first requires the evaluation of certain forest characteristics such as forest tract size, approximate forest age and forest edge:area ratio. The second method requires that a bird survey be conducted to determine which species are breeding in a particular forest, using appropriate bird survey methods and a qualified observer. Either method, as described below, may be used.

Habitat Determinations Based on Forest Characteristics

The presence and relative abundance or density of many forest nesting bird species is closely related to such features as forest area, age, shape and the proportion of edge habitat present (e.g., Whitcomb et al., 1981, Ambuel and Temple, 1983, Lynch and Whigham, 1984, Robbins et al., 1986, Askins et al., 1987, Keller et al., 1993). The Criteria provide two examples of forest areas that are considered potential FIDS habitat and are to be conserved in the Critical Area: 1) forest with 100 or more contiguous acres, and 2) riparian forest areas with a width of at least 300 feet [COMAR 27.01.09.04C(2)(a)]. In reality, forests that support FIDS have a wider range of characteristics. The following descriptions provide a more accurate guide for identifying FIDS habitat. When these conditions exist, habitat is assumed to be present and protection measures should be employed unless it is determined that the forest does not function as FIDS habitat.

A. Forests at least 50 acres in size with 10 or more acres of "forest interior" habitat (i.e., forest greater than 300 feet from the nearest forest edge). The majority of the forest tract should be dominated by pole-sized or larger trees (5 inches or more in diameter at breast height), or have a closed canopy; <u>or</u>

B. Riparian forests at least 50 acres in size with an average total width of at least 300 feet. The stream within the riparian forest should be perennial, based on field surveys or as indicated on the most recent 7.5 minute USGS topographic maps. The majority of the forest tract should be dominated by pole-sized or larger trees, or have a closed canopy.

In both cases, the size of the forest tract is based on the entire forest area, regardless of Critical Area boundaries or property lines. Two forests tracts may be considered unconnected or disjunct if they are separated by nonforested habitat which results in a permanent 30 - 50-foot break in the forest canopy (e.g., road, cleared right-of-way). The above forest characteristics are intended to be a guide. On occasion, FIDS may be present in smaller forests or absent in larger ones.

Habitat Determinations Based on Bird Surveys

A bird survey can be used in lieu of forest characteristics to determine if FIDS habitat is present; however, a survey is necessary only if an applicant (e.g., for a proposed development or timber harvest) refutes a habitat determination based on forest characteristics and seeks a confirmation of the bird species present. A confirmation is the responsibility of the applicant and must be based on current data obtained by a qualified observer using the bird survey methods described below.

Bird Survey Methods

The primary purpose of the bird survey (herein referred to as a "FIDS survey") is to determine the breeding status and approximate location of all bird species present, especially FIDS, in a given forest. This information is used to determine if FIDS habitat is present, as defined in the preceding section, and help develop appropriate conservation measures.

The Critical Area Commission requires the use of standard biological methods to conduct FIDS surveys. Accordingly, the following combination of methods are recommended: 1) point counts, 2) general searching or canvassing during early to mid-morning hours, and 3) canvassing during evening hours for nocturnal FIDS (e.g., Whip-poor-will, Barred Owl). The point count is a widely used quantitative bird survey method (Ralph et al., 1995). Detailed descriptions and evaluations of point count methodology are provided in such publications as Ralph and Scott (1981), Verner (1985), and Ralph et al. (1995). Generally, this method consists of an observer standing at a point or station for a standardized length of time (e.g., 10 minutes) and recording by species the number of all individual birds seen or heard. The count is then repeated at other stations (usually spaced at least 450-600 feet apart) located throughout a site or habitat. Canvassing, used in conjunction with point counts, helps to ensure that species which may be present are not missed and that sufficient observations have been made to accurately determine each species' breeding status. The minimum amount of field effort required to conduct a survey is three mornings (point counts and canvassing during daylight hours) and two evenings (canvassing for nocturnal species). Minimum standards for conducting FIDS surveys are as follows:

1. Conduct point counts during May 25-June 30, between one-half hour before sunrise, four hours after sunrise. The likelihood of detecting most FIDS during the breeding season, especially songbirds, is greatest during early morning hours within this five-week period. Canvassing should be done during the same five-week period within "safe dates" as listed in Table 1.

2. The minimum number of point count stations that should be located in a forest area is as follows:

Forest Area	No. Point Count Stations
< 200 acres	≥ 1 station per 15 acres
≥ 200-500 acres	≥ 1 station per 25 acres

3. Locate point count stations at least 450 feet apart and, where possible, place them 150 feet or more from the nearest forest edge.

4. Point count stations should be distributed throughout potential FIDS habitat and located in a manner that attempts to maximize the number of forest interior dwelling bird species detected. Habitat associations of each species should be taken into consideration so that relatively species-rich habitats (e.g., mature or old forest, structurally diverse stands, riparian forest, coves and ravines), species with specialized habitat requirements (e.g., Louisiana Waterthrush) and highly area-sensitive species are not overlooked or under surveyed. If possible, stratify the number of stations by major forest type and age class (e.g., mature upland deciduous forest, mature deciduous floodplain forest, pole-stage mixed pine-hardwood forest).

5. Conduct at least three point counts per station, with each count occurring on a different morning and separated by at least five days.

6. During each point count, record the species (including nonFIDS), breeding code (e.g., 'X' for a species seen or heard in breeding habitat within safe dates; see Appendix A), sex and age, if possible, of each individual bird or breeding pair of birds seen or heard. Also, on each day, record the date, start and finish time, general weather conditions and observer name. Record similar information during canvassing efforts.

7. Conduct point counts only during appropriate weather conditions. Avoid days with precipitation, heavy fog and strong winds. Calm, seasonably warm conditions are best.

8. Canvassing for diurnal species should be conducted during early to mid-morning (about one-half hour before sunrise to four hours after sunrise). These surveys can be done on the same mornings as point counts. Canvassing can be used to upgrade the breeding status (e.g., from "possible" to "probable" or "confirmed") of select species or to search areas where no point count stations are located. Canvassing can be particularly useful to upgrade the breeding status of relatively inconspicuous species with large breeding territories (Hairy Woodpecker, Pileated Woodpecker and Red-shouldered Hawk). Point counts alone may fail to detect these species frequently enough to accurately determine their breeding status.

9. Canvassing for nocturnal species should be conducted on at least two evenings, separated by at least five days. Broadcasting taped recordings of Barred Owl and Whip-poor-will calls may increase the probability of detecting these species; however, tape recordings

must be used judiciously since birds may abandon breeding territories if the tapes are played too often. Once a target species is detected, stop using the recording that evening.

10. All surveys on a given forest tract, especially point counts, should be conducted by the same observer.

11. The person conducting the survey must be a qualified observer; i.e., capable of identifying all potentially occurring birds by sight and sound. A current list of qualified observers can be obtained by contacting the Maryland Department of Natural Resources (DNR) or the Critical Area Commission. A person is deemed qualified by DNR if he or she successfully completes a DNR administered field test on bird identification, or is recommended to DNR as qualified by at least two references experienced in forest bird identification. The references should be familiar with the candidate's skills and experience in bird identification and survey methods, particularly in forested habitats. For additional information, please contact the Critical Area Commission or DNR.

12. The minimum data reporting requirements to DNR and the Critical Area Commission are as follows:

    a. For each point count station, the number, sex and age (if possible) of birds observed, by species, during each count.
    b. A table listing the proposed breeding status (observed, possible, probable or confirmed) of each species observed in the survey area and, if appropriate, nearby or adjacent areas. A species shall be considered breeding at a given site if survey data support a "probable" or "confirmed" breeding status determination. (See Appendix A for definitions of these criteria.)
    c. A map showing the location of each point count station and extent of canvassing.

Interpretation of Bird Survey Data

The Critical Area Commission and DNR provide final interpretation of survey data using the breeding status criteria listed in Appendix A as a guide. The entire forest tract is considered when determining the number and breeding status of forest interior dwelling bird species present.

If the survey yields either of the following results, FIDS habitat is present:

A. At least four of the species listed in Table 1 are present with a "probable" or "confirmed" breeding status, as defined by Robbins and Blom (1996); or

B. At least one highly area-sensitive species, as listed in Table 1, is present with a "probable" or "confirmed" breeding status.

CONSERVATION GUIDELINES

This section discusses planning tools that can be used to achieve long-term, wide-scale FIDS habitat conservation as well as FIDS conservation at the site-specific level.

A. Regional and Local Land Use Planning

The land use planning process, whether at the regional or local level, provides an opportunity to pro-actively address protection and conservation of FIDS habitat within and outside of the Critical Area. Land use planning efforts should be used to identify and protect the largest contiguous tracts of forest in a region. When possible, the quality of, and threats to, these habitat areas should be assessed in order to prioritize habitat areas for protection and conservation.

Land use planning tools, like mapping habitat areas or regional growth management, enable local jurisdictions to use local authority to minimize impacts to FIDS habitat at the site level and to protect the highest quality and most valuable forest and FIDS habitat in the region and over time. In addition, FIDS habitat conservation can encompass many other conservation goals that have been identified within a region. For example, by virtue of the size and composition of forest that is needed to protect FIDS, thousands more species will benefit from the protection of large high quality forest areas.

Land use planning tools, such as smart growth, flexibility in zoning and subdivision ordinances, can provide conservation of important forest habitat before it gets to the site planning stage. Growth Management and Smart Growth strategies enable local governments to direct growth away from forested and other sensitive resource areas and encourage development in areas with existing infrastructure.

Certain ordinances, regulations and development standards actually cause unintended forest fragmentation. In some cases, the goals of these ordinances may not allow for a great deal of flexibility, (e.g., public safety); however, wherever possible, these standards should be written to better achieve habitat and natural resources protection goals. Local governments should evaluate the effect of existing standards so that these standards do not result in unnecessary forest clearing, (i.e., requirements for large lots, extensive setbacks that increase the distance between lots, and wide roads).

In order to protect forest habitat, local ordinances should:

- provide flexibility in required road widths and frontage widths to eliminate/reduce gaps in the forest canopy

- reduce minimum lot size requirements to reduce the amount of land that is consumed by single family development

- encourage transfer of development rights from large forested regions to areas with existing infrastructure and fewer natural resources

- provide flexibility in area requirements for septic reserve areas where practicable

- require clustering to reduce forest fragmentation

- encourage shared driveways and shared septic systems to reduce openings in the forest.

See Appendix B for additional information on flexible ordinance language and development standards.

B. Site Design Guidelines for FIDS

In addition to land use planning, site design is an important approach to FIDS habitat conservation. In general, the greatest loss of FIDS habitat occurs when development fragments or intrudes into the forest interior or increases the area of forest edge. The following ***Site Design Guidelines*** (also in Appendix C) provide guidance to landowners and plan reviewers on how to achieve the greatest possible protection and conservation of FIDS habitat when development is proposed. A key to using the ***Site Design Guidelines*** is to determine and assess the amount of interior habitat that would be impacted under a proposed development scenario. When these guidelines are followed, the impacts to interior forest habitat are minimized.

Local governments should evaluate their existing subdivision and zoning ordinances to determine if they will allow the implementation of the following ***Site Design Guidelines***.

Site Design Guidelines

1. Restrict development to nonforested areas.

2. If forest loss or disturbance is unavoidable, concentrate or restrict development to the following areas:

    a. the perimeter of the forest (i.e., within 300 feet of the existing forest edge)
    b. thin strips of upland forest less than 300 feet wide
    c. small, isolated forests less than 50 acres in size
    d. portions of the forest with low quality FIDS habitat, (i.e., areas that are already heavily fragmented, relatively young, exhibit low structural diversity, etc.).

3. Maximize the amount of forest "interior" (forest area > 300 feet from the forest edge) within each forest tract (i.e., minimize the forest edge:area ratio). Circular forest tracts are ideal and square tracts are better than rectangular or long, linear forests.

4. Minimize forest isolation. Generally, forests that are adjacent, close to, or connected to other forests provide higher quality FIDS habitat than more isolated forests.

5. Limit forest removal to the "footprint" of houses and to that which is necessary for the placement of roads and driveways.

6. Minimize the number and length of driveways and roads.

7. Roads and driveways should be as narrow as possible; preferably less than 25 feet in width and 15 feet in width, respectively.

8. Maintain forest canopy closure over roads and driveways.

9. Maintain forest habitat up to the edges of roads and driveways; do not create or maintain mowed grassy berms.

10. Maintain or create wildlife corridors.

11. Do not remove or disturb forest habitat during April-August, the breeding season for most FIDS. This seasonal restriction may be expanded to February-August if certain early nesting FIDS (e.g., Barred Owl) are present.

12. Landscape homes with native trees, shrubs and other plants and/or encourage homeowners to do so.

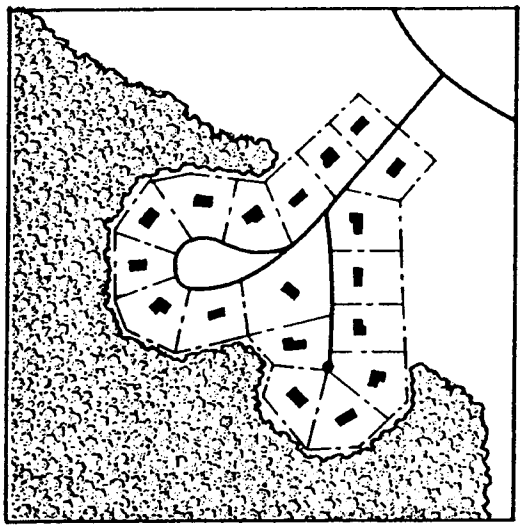
13. Encourage homeowners to keep pet cats indoors or, if taken outside, kept on a leash or inside a fenced area.

14. In forested areas reserved from development, promote the development of a diverse forest understory by removing livestock from forested areas and controlling white-tailed deer populations. Do not mow the forest understory or remove woody debris and snags.

15. Afforestation efforts should target a) riparian or streamside areas that lack woody vegetative buffers, b) forested riparian areas less than 300 feet wide, and c) gaps or peninsulas of nonforested habitat within or adjacent to existing FIDS habitat

See Figures 3A, 3B, and 3C for illustrations of several of the ***Site Design Guidelines.***

GUIDELINES NOT FOLLOWED



GUDELINES FOLLOWED

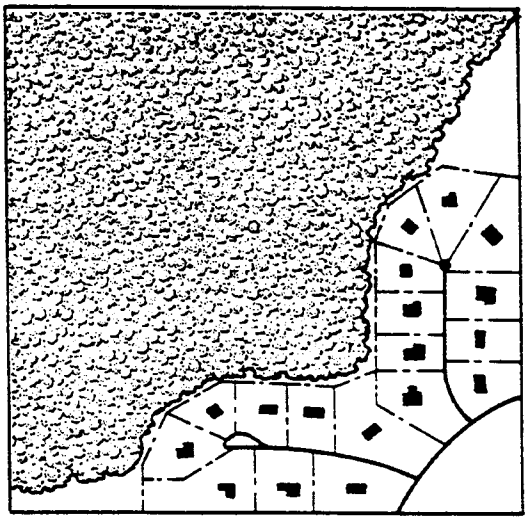
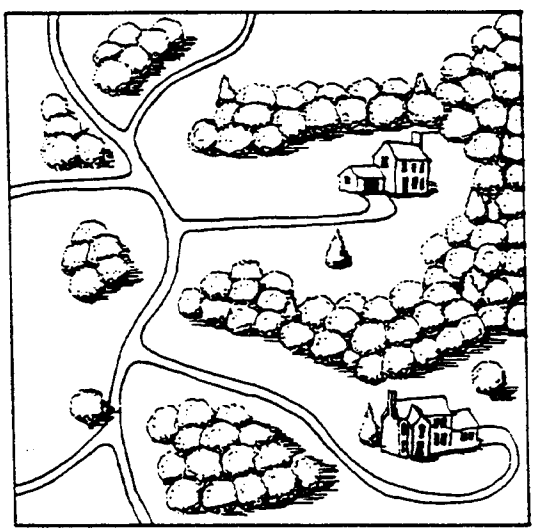


Figure 3A. Restrict development to non-forested areas when possible or limit development to forest edge in order to maximize retention of forest interior.

GUIDELINES NOT FOLLOWED



GUIDELINES FOLLOWED

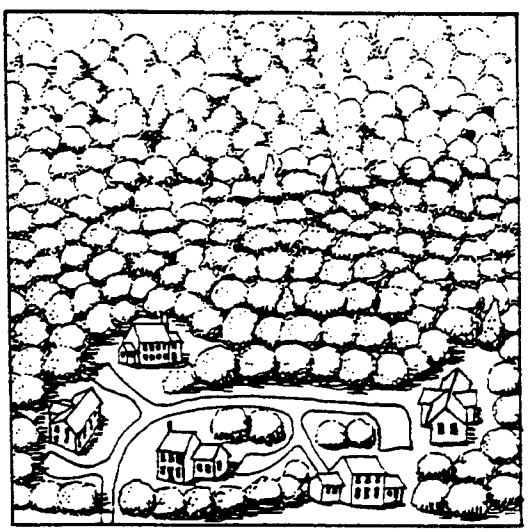
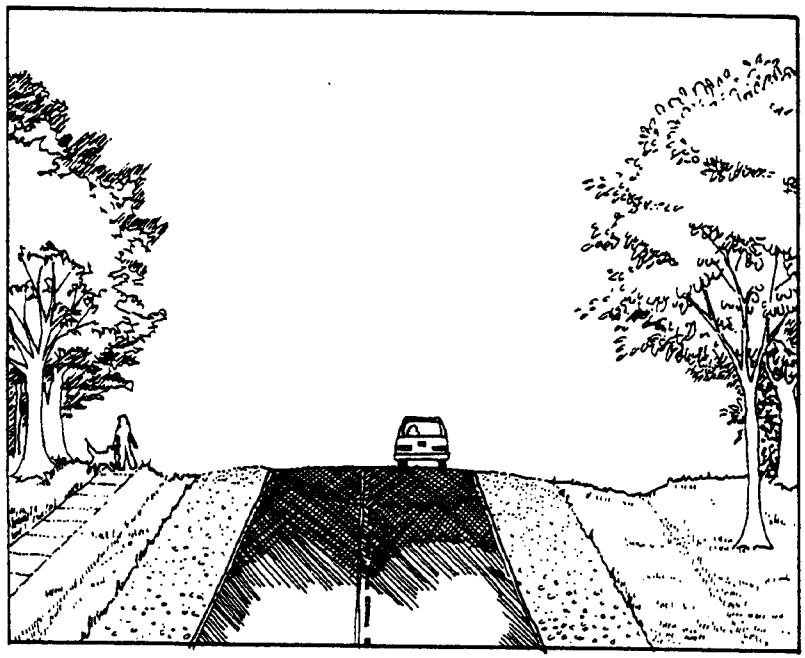


Figure 3B. Limit the amount of forest clearing, reduce the length of driveways and other roads, and cluster development to minimize impacts to forest.

GUIDELINES NOT FOLLOWED



GUIDELINES FOLLOWED

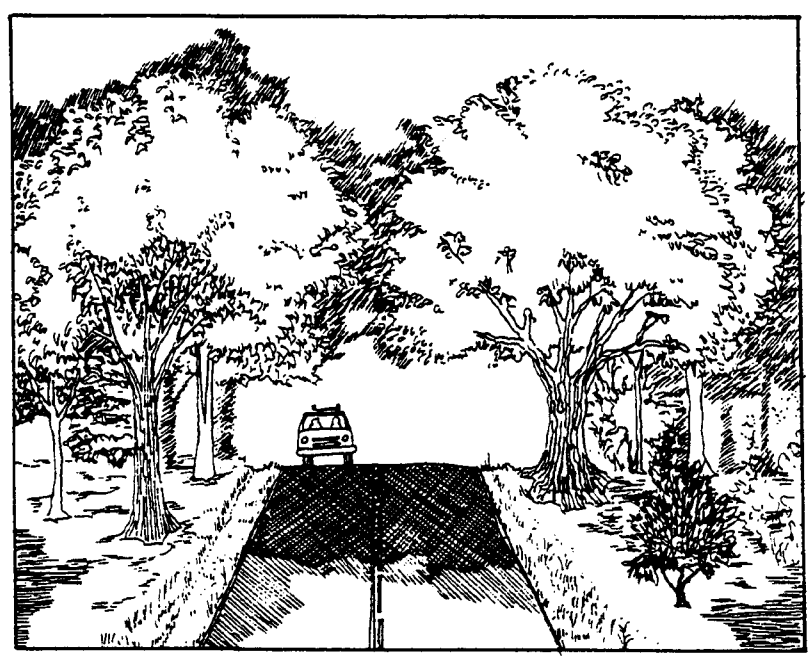


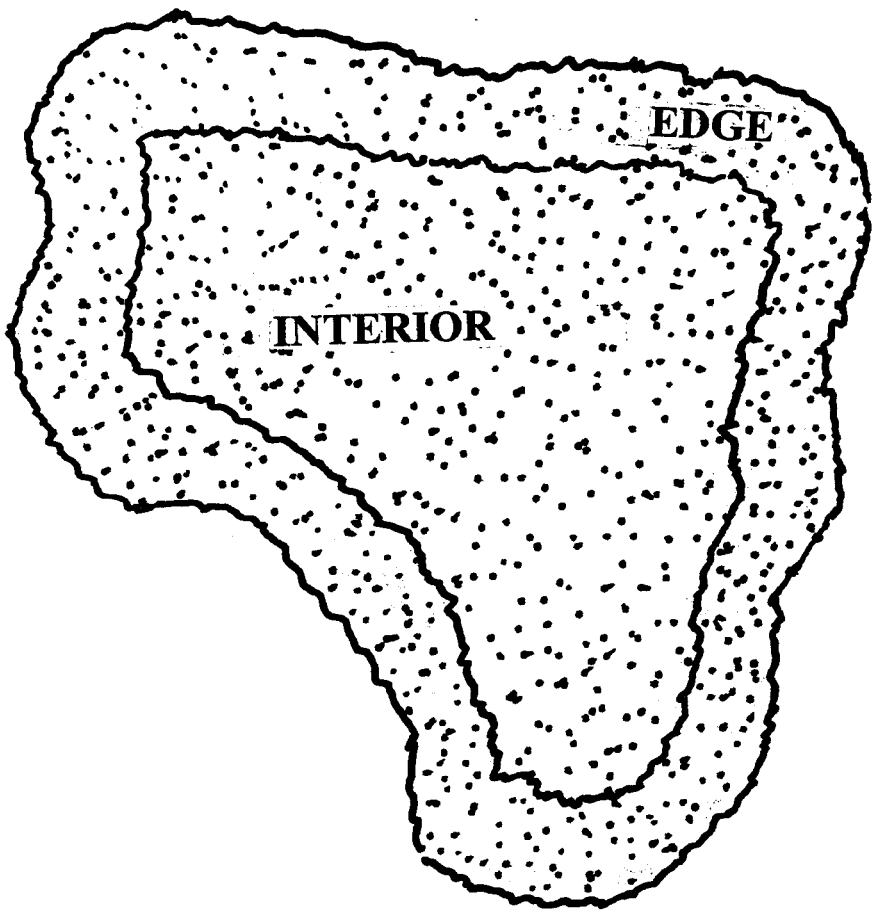
Figure 3C. Maintain forest habitat to edge of roads and driveways and maintain canopy closure over roads, where possible.

DETERMINATION OF INTERIOR HABITAT LOSS

It will often be necessary to calculate the amount of forest interior on a site before development and after development. The following paragraph explains how to do this.

Direct habitat loss refers to the actual acreage of forest area that is cut or cleared. Interior habitat loss on a parcel refers to acres of forest interior that are cut or converted to edge. To determine the interior habitat of a parcel, the forested edge of 300 feet is subtracted from the total contiguous forest. The area left is forest interior provided it is at least ten acres in size. When the FIDS ***Guidelines*** (outlined above) are followed the amount of interior habitat loss will be minimized. When evaluating site design options for a particular property, potential impacts to interior habitat after development are compared to predevelopment interior habitat. The site plan that results in the least amount of interior habitat impacts is generally the better one. Figure 4 shows a schematic of a contiguous forest tract with edge habitat and interior habitat identified.

Figure 4. Edge vs. Interior



MITIGATION

The Criteria direct local jurisdictions to protect and conserve those forested areas necessary to support FIDS by developing a *management program* which has as its objective conserving the wildlife that inhabit or use the forested areas (COMAR 27.01.09.04). This provision requires the conservation and protection of all FIDS habitat, even that located on grandfathered lots. The primary objective of FIDS habitat conservation and protection is to preserve or retain the maximum amount of contiguous, undisturbed forest habitat, particularly the portion of forest that is interior habitat. This protection strategy requires that most existing FIDS habitat be preserved on-site. This can best be achieved by following the ***Site Design Guidelines***; however, there are situations where FIDS habitat impacts occur even when the ***Guidelines*** are followed. Therefore, in order to meet the conservation and protection requirement, local jurisdictions should include in their management programs mitigation requirements that must be met whenever FIDS habitat is impacted.

Mitigation that results in the conservation and protection of FIDS habitat can be achieved in a number of ways. FIDS mitigation can, in many cases, be achieved on-site concurrently with general forest replacement requirements (reforestation) if the reforestation area expands or creates new FIDS habitat. Off-site mitigation should only be considered when no effective, long-term on-site habitat protection is possible. This determination should be made by the local jurisdiction with the input of DNR and the Critical Area Commission staff. The use of off-site mitigation, if well directed, may provide for the creation/protection of large, potentially high quality forests. This method of FIDS protection is similar to the concept of a "no net loss" made popular by wetland protection programs where impacts must first be avoided and only when avoidance is not possible, new habitat is created to replace wetlands lost.

For example, a large subdivision may be proposed on a site that contains forest that has been identified as FIDS habitat. Even if development is proposed predominantly in the nonforested areas of the site, some impacts to the forest edge may occur. While the ***Site Design Guidelines*** have been followed by avoiding direct impacts to the forest interior, there are still FIDS habitat impacts. These impacts should be mitigated by creating FIDS habitat on- or off-site.

In another example, there may be no options for avoiding impacts when developing a small forested grandfathered lot with a single-family dwelling. If it is determined that there are no alternative development scenarios where FIDS habitat impacts could be avoided, off-site mitigation may provide a better long-term FIDS habitat protection strategy.

As an alternative to requiring small property owners to find their own sites for FIDS mitigation, local jurisdictions may adopt a fee-in-lieu program under which the local jurisdiction would take responsibility for implementing the mitigation. A local government may be better equipped to ensure successful restoration and protection of a mitigation area as well as to help landowners of smaller properties meet requirements. The opportunity for creating and maintaining large forested habitat areas may be greater when a number of smaller projects are combined; however,

it is recommended that in the case of impacts due to larger projects (e.g., new subdivision, commercial development) the landowner or developer should be held responsible for locating the mitigation site.

How much mitigation should be required?

When FIDS habitat is impacted, the amount of FIDS mitigation required is based on the following:

1. A determination of whether or not the ***Guidelines*** are followed; * **

2. The number of acres of FIDS habitat that is directly cut; and

3. The number of acres of interior habitat loss (cut or converted to edge).

   If it is determined that the ***Guidelines*** were followed, the amount of FIDS mitigation should equal **the number of acres of *direct forest habitat loss.***

   If it is determined that the ***Guidelines*** were not followed, the amount of FIDS mitigation should equal **the number of acres of *direct forest habitat loss*, plus, two times the number of acres of *interior habitat loss* (FIDS habitat cut or converted to edge).**

   ** Factors that may be taken into account when determining if the **Guidelines** can be followed include the size of the parcel, whether or not the parcel is grandfathered and site constraints that may limit development designs.*

   *** One means to help evaluate whether an adequate attempt has been made to apply the **Guidelines** is to determine if a minimum of 80% of predevelopment forest interior will remain as viable habitat after development. This method should not be the only criteria that is considered. An attempt should always be made to apply all the **Guidelines** to every project.*

The following steps are proposed as a method to determine the amount of interior habitat lost or impacted under a proposed development scenario.

1. Identify and calculate the acreage of all FIDS habitat on the parcel, taking into account all contiguous forest areas on and off the property. (See section on how to determine if FIDS habitat is present.)

2. Identify and calculate the pre-development acres of forest interior by delineating the 300-foot wide forested edge and measuring the acreage of remaining interior habitat. (See Figure 6.)

3. Calculate the area of forest cut in the interior and edge of FIDS habitat. This area is considered the ***direct forest habitat loss.***

4. Determine the post-development forest cover and remaining interior habitat by delineating the proposed new edge habitat after development (300-foot wide forested edge) and measuring the acres of interior habitat that remain. Edge habitat is created whenever there is a minimum 30-foot wide break in the forest canopy (e.g., a road or lawn).

5. Subtract the post-development interior from the pre-development interior. This area is considered the ***interior forest habitat loss.***

Appendix D is a FIDS Conservation Worksheet to use in helping to evaluate how well the Guidelines have been followed and to help with the calculation of any mitigation.

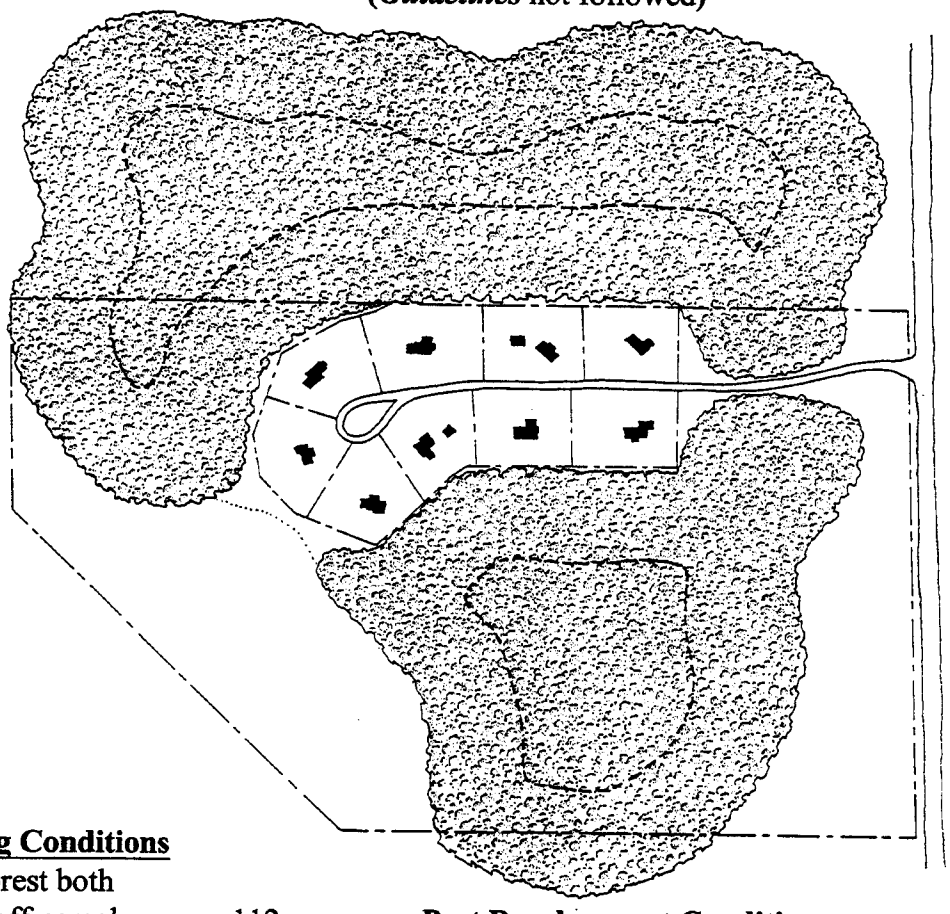
The following example demonstrates how two site designs with the same number of acres cleared can result in widely different levels of interior impacts.

Example:

Consider a 96-acre site purchased for development. The site is 70% forested with agricultural fields on the southwestern and the eastern edges of the parcel. The forest on the property is connected to a larger forest to the north. The entire forest both on and off the parcel is functioning as FIDS habitat. The owner proposes to build nine houses. He directs his consultant to design two different layouts for the nine lots. The consultant prepares two site plans and calculates the amount of direct and interior loss of FIDS habitat after development using the method described above. (See Figures 5A and 5B.)

Figure 5A

DEVELOPMENT SCENARIO 1
(***Guidelines*** not followed)



Existing Conditions

Total forest both on and off parcel = 112 acres

Parcel size = 96 acres

Forest on parcel prior to development = 67 acres

FIDS habitat on parcel prior to development = 67 acres

Forest interior prior to development = 38 acres

Post Development Conditions

Total forest to be = 21 acres

Total forest to remain on parcel = 46 acres

Forest in northern corner of parcel =10acres

Forest in southern portion of parcel = 36 acres

Total FIDS habitat to remain on parcel = 10 acres

(Forest fragment in southern portion of parcel is less than 50 acres, too small to support FID; northern portion of the forest is part of a forest tract that is larger than 50 acres with greater than 10 acres of interior.)

Interior forest to remain on parcel = 1 acre

FIDS Mitigation (***Guidelines*** not followed)

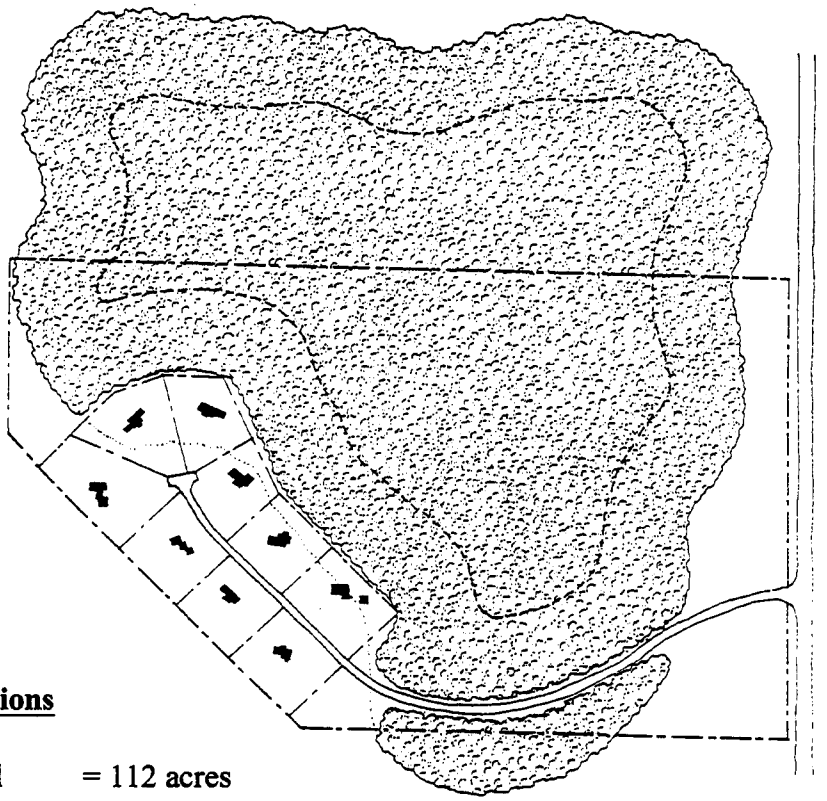
Direct FIDS forest loss = 21 acres

Interior forest loss = 37 acres

Mitigation = Direct FIDS forest loss + 2(interior forest loss) = 21 acres + 2(37) = 95 acre

Figure 5B.

DEVELOPMENT SCENARIO 2
(***Guidelines*** followed)



Existing Conditions

Total forest both on and off parcel = 112 acres

Parcel size = 96 acres

Forest on parcel prior to development = 67 acres

FIDS habitat on parcel prior to development = 67 acres

Forest interior prior to development = 38 acres

Post Development Conditions

Total forest to be cut = 10 acres

Total forest to remain on parcel = 57

Total FIDS habitat to remain on parcel = 55 acres
(A small portion of the forest to be left in the southern part of the site will be isolated from the rest of the forest and too small to function as FIDS habitat.)

Total interior to remain = 27 acres

FIDS Mitigation (***Guidelines*** followed)

Direct FIDS habitat loss = 10 acres
Interior forest loss = 11 acres
Mitigation = Direct FIDS habitat loss = 10 acres

What is Acceptable as Mitigation?

The goal of mitigation is to provide long-term FIDS habitat; therefore, FIDS mitigation sites should contain or result in, through reforestation, a contiguous area of at least 100 acres with a minimum of 20 acres of interior. In those situations where it is not possible to find an appropriate area of 100 acres it may be possible to reduce the minimum size to 50 acres if the reforestation guidelines on the following page are followed. The minimum contiguous forested area does not have to be contained in one parcel. There should be a reasonable expectation that a mitigation area will remain undeveloped and forested in perpetuity. (For assistance in finding appropriate mitigation sites see Appendix E, Resources for Locating Mitigation Sites.)

Once the areas of ***direct forest habitat loss*** and ***interior forest habitat loss*** have been calculated and the required acreage of mitigation is determined, mitigation for the FIDS forest habitat losses may be either in the form of:

> ***Creation* of FIDS habitat through reforestation, or**
> ***Protection* of existing FIDS habitat once mitigation for direct losses have been met**

For ***direct forest habitat*** impacts, all mitigation must result in the creation of new FIDS habitat.** Again, simple forest replacement proposed to meet the basic Critical Area reforestation requirements can satisfy the FIDS mitigation **only** if the reforestation area creates a new area of FIDS habitat or expands an existing habitat area.

***There may be some flexibility in dealing with grandfathered lots of 1 acre or less when a jurisdiction can demonstrate that other programs within the jurisdiction provide protection and creation of forests that will function as FIDS habitat. Examples of such programs include:*

> *using money from other mitigation fee-in-lieu funds to create FIDS habitat*
> *protecting forest lands through conservation programs such as Rural Legacy*
> *protecting forests outside of the Critical Area*

Once mitigation for the direct forest habitat impact has been satisfied, mitigation for the ***interior forest habitat*** impact may be achieved either by creation of FIDS habitat (reforestation) or protection of existing FIDS habitat. However, when the protection option is chosen, the protected acres are given only half credit toward the required mitigation acres. Reforestation is given full credit toward meeting the interior forest habitat mitigation requirements while protection is only given one-half credit due to the fact that all forests in the Critical Area are afforded some protection under the Critical Area Criteria. While the long-term viability of existing FIDS habitat is improved with permanent protection, new habitat areas must be created to maintain and increase the area of viable FIDS habitat in the Critical Area.

Creation of FIDS habitat through reforestation

Reforestation to create FIDS habitat refers to the reestablishment of locally native forest on a currently nonforested site that will create a forest large enough to function as FIDS habitat. Reforestation through natural succession or planting is given full credit toward FIDS mitigation requirements. For example, if the total mitigation required for impacts to FIDS habitat is ten acres, then reforestation of ten acres of FIDS habitat would fulfill the FIDS mitigation requirement.

If mitigation creates new FIDS habitat through planting or natural regeneration, this mitigation may count toward the basic Critical Area forest replacement requirements; however, forest replacement may not count toward FIDS mitigation unless it creates FIDS habitat.

FIDS Reforestation Guidelines

1. Reforestation should be designed to maximize the area of interior habitat (see Figure 6).

2. Fill in gaps or openings in existing forested areas. Reforest nonforested peninsulas (see Figure 6).

3. Establish or extend a riparian forest buffer to provide a minimum buffer width of at least 300 feet. This reforestation should be part of a forest tract at least 50 acres in size (see Figure 6).

4. All mitigation, with the possible exception of that along a riparian area, should result in the establishment of a minimum forest tract size of 100 acres of which 20 acres is forest interior.*

5. Use natural succession and/or plantings of locally native tree and shrub species to create new habitat. Appropriate action, including the control of invasive species, should be taken to help ensure that the original forest type is replaced.

6. When enlarging forest patches, create shapes such as circles or squares which minimize edge and provide interior habitat.

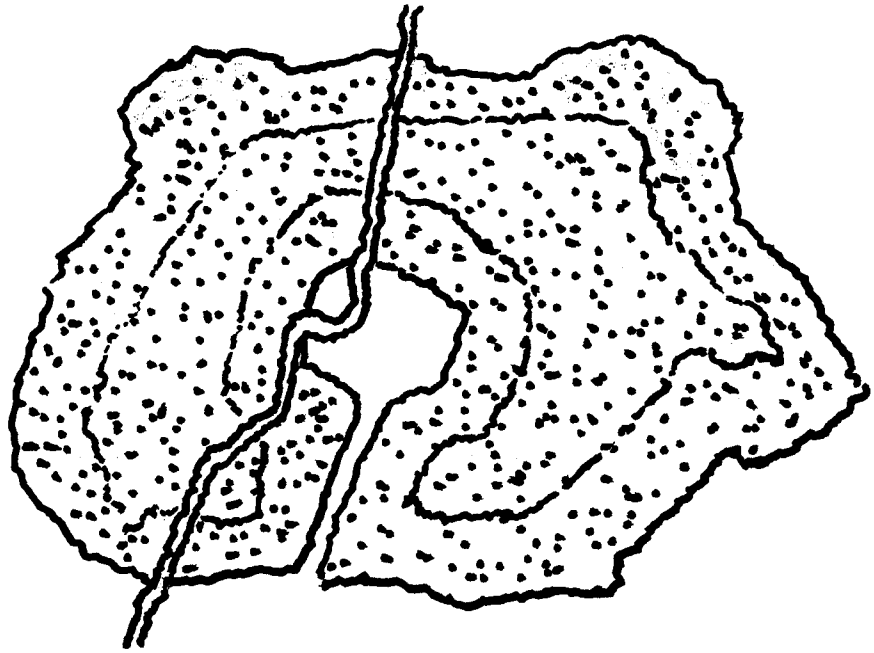
7. Connect forest fragments to other forest or forest fragments with a corridor at least 300 feet in width.

8. The reforestation area should be comprised predominantly of hardwood. If planting, plans should be designed so that at the time of canopy closure at least 75% of the canopy tree species are locally native hardwoods.

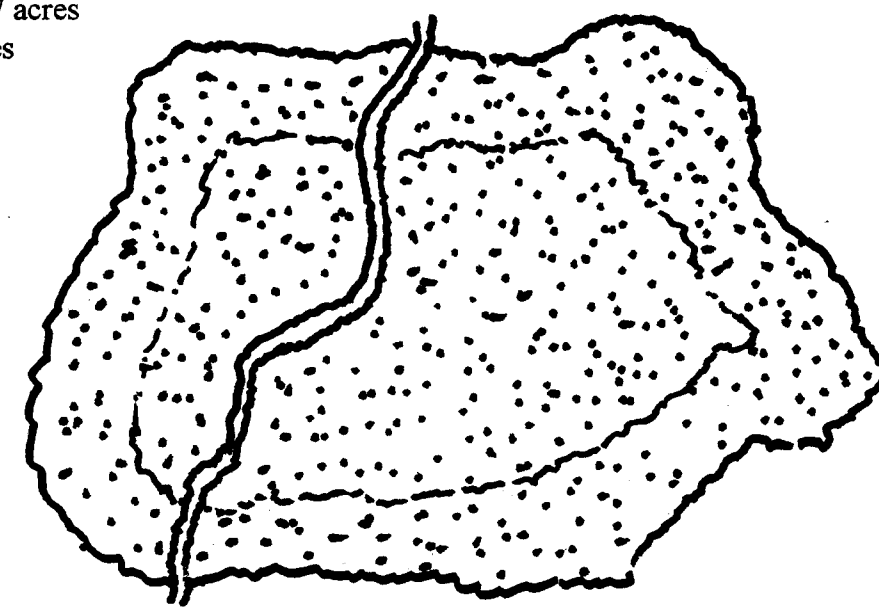
9. All mitigation sites must be permanently protected through a conservation easement or other legal mechanism (See Appendix F). No development may occur in these areas. Some timber harvesting may occur provided Critical Area timber harvest guidelines are followed.

** It may be possible to have a mitigation area less than 100 acres when a 50-100 acre mitigation site: -is adjacent to a major river corridor (e.g., Potomac, Choptank, Chester) or along the Bay especially along the tips of peninsulas----these landscape features provide FIDS breeding habitat and tend to be important migratory stopover areas for FIDS and other landbirds; - is located in a heavily forested landscape (>75% forest within 10km) and large forest tracts (>500 acres) are nearby (within 500 m); - contains old growth forest, unique natural communities and/or rare, threatened or endangered species;*

Robert Savannah, U.S. Fish and Wildlife Service



Forest tract before reforestation: 117 acres
Interior before reforestation: 40 acres



Reforestation acreage: 9 acres
Forest tract after reforestation: 66 acres
Interior after reforestation: 126 acres (This is a 61% increase in interior, with only an 8% increase in total forest tract size.)

Figure 6. Target mitigation to fill openings in existing forest and to extend or fill in gaps along riparian areas.

Protection of existing FIDS habitat

Protection of existing FIDS habitat as a form of mitigation refers to the permanent protection of existing forest habitat from development impacts. Protection may be achieved through the acquisition of the land, purchase of development rights and protection by conservation easements. Half credit toward the FIDS mitigation requirement is given. For example, if the mitigation required for FIDS habitat is 10 acres, then the protection of 20 acres of FIDS habitat would fulfill the mitigation requirement.

FIDS Protection Guidelines

1. All mitigation should result in the establishment of a minimum forest tract size of 100 acres of which 20 acres is forest interior. Generally, the larger the size of a forest tract, the greater the value for FIDS.

2. In most cases, the older a forest stand, the more valuable it is for the greatest number of FIDS.

3. Protect forest land adjacent to lands that are currently protected or are managed with a conservation objective (e.g., public lands, lands protected through land trusts, wetlands, habitat of threatened and endangered species.)

4. All mitigation sites must be permanently protected. No development may occur in these areas. Some timber harvesting may occur provided Critical Area timber harvest guidelines are followed. Refer to Appendix E for information on conservation easements.

For a list of information to submit to local government when proposing a mitigation site for either creation or protection of FIDS habitat see Appendix G.

Conclusion

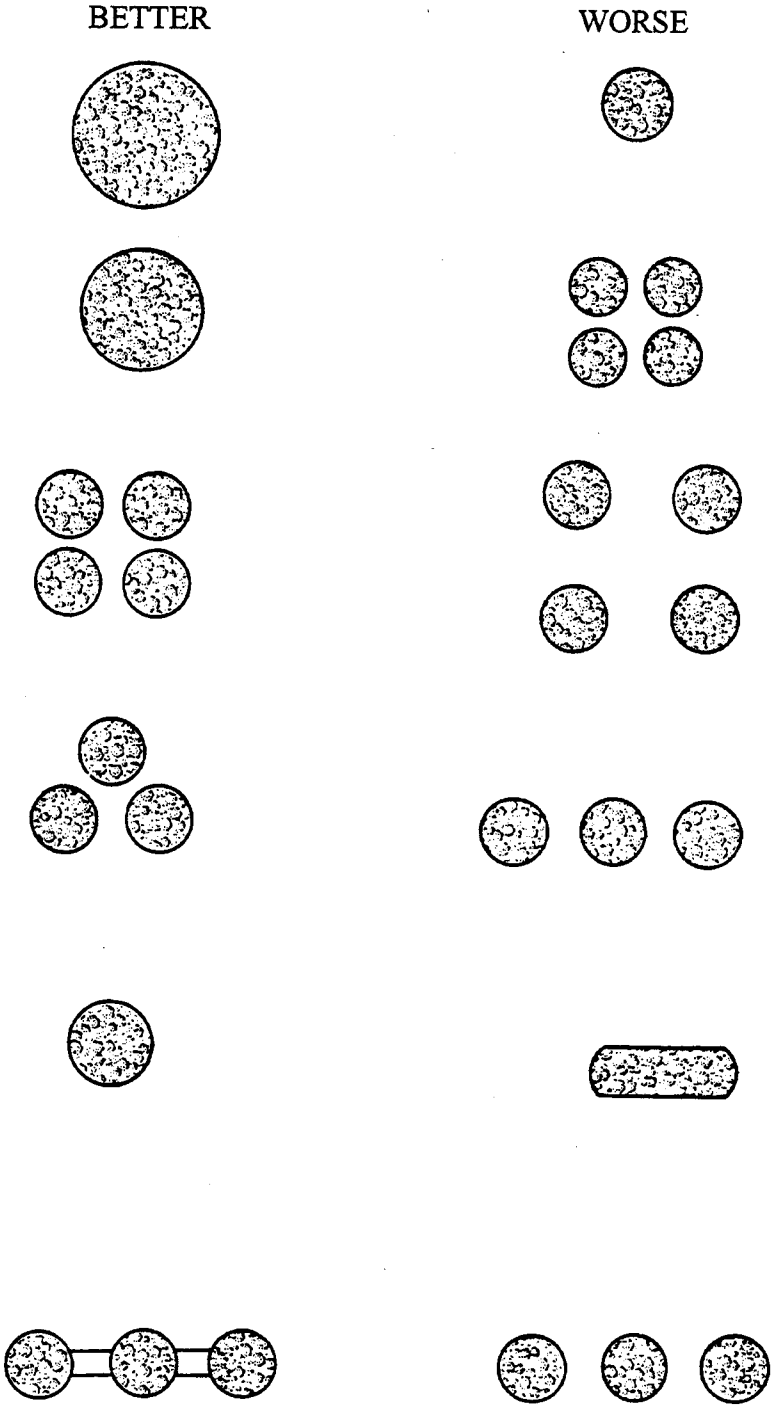
Mitigation is just one part of an overall conservation strategy for FIDS in the Critical Area. The most effective FIDS conservation begins with avoiding development impacts to FIDS habitat through long-term land use planning and implementation of ***Site Design Guidelines***. In a hierarchy of protection strategies for FIDS, mitigation is a last resort, to be used only after land planning and site design options have been exhausted.

Conservation of FIDS habitat should be considered in other existing voluntary and regulatory programs. Many land trusts, local and state government, and incentive programs are currently protecting forests that can serve as core tracts to add on to within a county or a region. FIDS conservation can, in many cases, be dovetailed with wetland protection and mitigation, threatened and endangered species protection and Forest Conservation Act requirements.

Cooperation across jurisdictional boundaries and between public and private interests will also greatly increase the effectiveness of FIDS conservation throughout the region.

The design principles represented in Figure 7 summarize landscape level conservation principles that apply to FIDS at both the large and small scale. It is important to keep these principles in mind when considering either the protection of existing habitat and/or mitigation for habitat impacts.

Figure 7. A schematic of preserve design principles as they apply to forest interior dwelling bird (FID) conservation; from Diamond (1975).



A. Maximize forest tract size - a large forest is better than a smaller one.

B. Avoid fragmentation of existing contiguous forests - a single large forest is better than several smaller ones of the same total area.

C. Minimize forest isolation - forests in close proximity to each other are better than forests located far apart.

D. Maximize the juxtaposition of individual forest tracts.

E. Minimize the forest edge:area ratio - forests that approach a circle or square will provide a greater proportion of "interior" habitat than thin, narrow forests of the same total area.

F. Maximize connectivity between forests and the width of the connective corridors - forests that are effectively linked are better than disjunct forests.

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DEFINITIONS OF BREEDING STATUS CATEGORIES AND CODES.

There are 3 breeding categories: POSSIBLE, PROBABLE and CONFIRMED. Different codes exist within categories. The correct use of the categories and codes is essential for documenting breeding evidence.

POSSIBLE (always a 1-letter code)

O - Species observed at a site, but not in breeding habitat. This code is primarily for birds that are not believed to breed at the site. Flyovers and any species outside of "Safe Dates" (Table 1, page 10) with no further breeding evidence should be recorded as 'O'.

X - Species heard or seen in breeding habitat within Safe Dates. Be very cautious during migration periods.

PROBABLE (always a 1-letter code)

A - Agitated behavior or anxiety calls from adult. Parent birds respond to threats with distress calls or by attacking intruders. This does not include responses to "pishing" or tape playing of recorded calls.

P - Pair observed in suitable breeding habitat within safe dates. Use this code with caution.

T - Territorial behavior or singing male present at same location on at least 2 different days. Territoriality can be presumed from defensive encounters between individuals of the same species, or by observing a male singing from a variety of perches within a small area.

C - Courtship or copulation observed. This includes displays, courtship feeding, and birds mating.

N - Visiting probable nest site. This code applies when a bird is observed visiting a probable nest site repeatedly, but no further evidence is seen.

B - Nest building by wrens or excavation by woodpeckers. Both groups build dummy or roosting nests at the same time they are building a real one, but an unmated male will exhibit the same behavior.

CONFIRMED (always a 2-letter code)

NB - Nest building (except wrens and woodpeckers) or adult carrying nesting material. Be cautious with this code since carrying sticks is part of the courtship ritual (Code 'C') for some species.

D - Distraction display; including injury feigning. Agitated behavior (Code 'A') can be mistaken for a distraction display.

UN - Used nest found. Use extreme caution. Nests are difficult to identify. If unsure, forget it - removing or collecting a nest is illegal without a permit.

FL - Recently fledged young or downy young. This includes dependent young. Be cautious of species that range widely soon after fledging. Don't forget to look for dead fledglings or nestlings along roads.

FS - Adult bird seen carrying fecal sac. Excreted feces of nestlings are contained in a membranous sac and often carried away from the nest by the parents.

FY - Adult carrying food for young. Be cautious since some species feed young long after wandering from a nest site or carry food for a long distance. Many also engage in courtship feeding (Code 'C').

ON - Occupied nest. Presumed by activity of parents; entering nest hole and staying, parents exchanging incubation responsibilities, etc. Primarily intended for hole nesters and nests too inaccessible to see the contents.

NE - Nest with eggs or eggshells or ground. Identify these very carefully.

NY - Nest with young seen or heard.

Examples to use as guidelines; from the "Maryland and DC Breeding Bird Atlas Project Handbook"

1. Woodpecker drumming: POSSIBLE - X within Safe Dates; PROBABLE - T if same place 2 different days. This refers to territorial drumming not feeding.

2. Duck summers on pond without suitable adjacent marshes: POSSIBLE - O.

3. Woodcock nuptial flights for 3 weeks: PROBABLE - T (POSSIBLE - X if observed only once); PROBABLE - C if courtship and display to female observed.

4. Gulls frequenting dumps, plowed fields, parking lots throughout summer in unsuitable nesting habitat: POSSIBLE - O.

5. Song Sparrow seen carrying nesting material: CONFIRMED - NB.

6. Wood Thrush seen on nest for extended period of time, but too high to see contents: CONFIRMED - ON.

7. Great Blue Heron feeding along a river away from any known nesting area: POSSIBLE - O. Watch such a bird closely. It could lead to a colony.

8. Second year American Redstart singing abnormal song in a hedgerow in early June: POSSIBLE - O.

9. Male House Wren sings all summer and stuffs nest boxes with sticks; no evidence of a mate: PROBABLE - B.

10. Male and female Scarlet Tanagers observed together several times in the same area, but no nest or young ever seen: PROBABLE - P.

FLEXIBLE ORDINANCE LANGUAGE AND DEVELOPMENT STANDARDS

Adapted from the *Model Development Principles*, 1998.
(Center for Watershed Protection, Website: www.cwp.org)

The following model development principles provide site design guidance for economically viable, yet environmentally sensitive development. The goal of using the principles is to provide planners, developers and local officials with benchmarks to investigate where existing ordinances may be modified to reduce impervious cover, conserve natural areas (e.g., forest and FIDS habitat) and prevent stormwater pollution. These development principles identify areas where existing codes and standards can be changed to better protect forest, streams and wetlands at the local level.

Residential Streets and Parking Lots (Habitat for Cars)

1. Design residential streets for the minimum required pavement width needed to support travel lanes; on-street parking; and emergency, maintenance and service vehicle access. These widths should be based on traffic volume.

2. Reduce the total length of residential streets by examining alternative street layouts to determine the best option for increasing number of homes per unit length.

3. Wherever possible, residential street right-of-way widths should reflect the minimum required to accommodate the travel-way, the sidewalk and vegetated open channels. Utilities and storm drains should be located within the pavement section of the right-of-way, wherever feasible.

4. Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

5. Where density, topography, soils and slope permit, vegetated channels should be used in the street right-of-way to convey and treat stormwater runoff.

6. The required parking ratio governing a particular land use or activity should be enforced as both a maximum and a minimum in order to curb excess parking space.

7. Parking codes should be revised to lower parking requirements where mass transit is available or enforceable shared parking arrangements are made.

8. Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes and using pervious materials in the spillover parking areas.

9. Provide meaningful incentives to encourage structured and shared parking to make it more economically viable.

10. Wherever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips and/or other practices that can be integrated into required landscaping areas and traffic islands.

11. Advocate open space development that incorporates smaller lot sizes to minimize total impervious area, reduce total construction costs, conserve natural areas, provide community recreational space and promote watershed protection.

12. Relax side yard setbacks and allow narrower frontages to reduce total road length in the community and overall site imperviousness. Relax front setback requirements to minimize driveway lengths and reduce overall lot imperviousness.

13. Promote more flexible design standards for residential subdivision sidewalks.

14. Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

15. Clearly specify how community open space will be managed and designate a sustainable legal entity responsible for managing both natural and recreational open space.

16. Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

17. Create a variable width, naturally vegetated buffer system along all perennial streams that also encompasses critical environmental features such as the 100-year floodplain, steep slopes and freshwater wetlands.

18. The riparian stream buffer should be preserved or restored with native vegetation that can be maintained throughout the plan review, delineation, construction and occupancy stages of development.

19. Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access and provide fire protection. A fixed portion of any community open space should be managed as protected green space in a consolidated manner.

20. Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas and promoting the use of native plants. Wherever practical, manage community open space, street rights-of-way, parking lot islands and other landscaped areas to promote natural vegetation.

21. Incentives and flexibility in the form of density compensation, buffer averaging, property tax reduction, stormwater credits and by-right open space development should be encouraged to promote conservation of stream buffers, forests, meadows and other areas of environmental value. In addition, off-site mitigation consistent with locally adopted watershed plans should be encouraged.

22. New stormwater outfall should not discharge unmanaged stormwater into jurisdictional wetlands, sole-source aquifers, or other waterbodies.

SITE DESIGN GUIDELINES

The *Site Design Guidelines* provide guidance on how to achieve the greatest possible protection and conservation of FIDS habitat when development is proposed. The guidelines are recommended to be followed in order to minimize the impacts to interior forest habitat.

1. Restrict development to nonforested areas.

2. If forest loss or disturbance is unavoidable, concentrate or restrict development to the following areas:

    a. the perimeter of the forest (i.e., within 300 feet of the existing forest edge)
    b. thin strips of upland forest less than 300 feet wide
    c. small, isolated forests less than 50 acres in size
    d. portions of the forest with low quality FIDS habitat, (e.g., areas that are already heavily fragmented, relatively young, exhibit low structural diversity, etc.).

3. Maximize the amount of forest "interior" (forest area > 300 feet from the forest edge) within each forest tract (i.e., minimize the forest edge:area ratio). Circular forest tracts are ideal and square tracts are better than rectangular or long, linear forests.

4. Minimize forest isolation. Generally, forests that are adjacent, close to, or connected to other forests provide higher quality FIDS habitat than more isolated forests.

5. Limit forest removal to the "footprint" of houses and to that which is necessary for the placement of roads and driveways.

6. Minimize the number and length of driveways and roads.

7. Roads and driveways should be as narrow as possible; preferably less than 25 feet in width and 15 feet in width, respectively.

8. Maintain forest canopy closure over roads and driveways.

9. Maintain forest habitat up to the edges of roads and driveways; do not create or maintain mowed grassy berms.

10. Maintain or create wildlife corridors.

11. Do not remove or disturb forest habitat during April-August, the breeding season for most FIDS. This seasonal restriction may be expanded to February-August if certain early nesting FIDS (e.g., Barred Owl) are present.

12. Landscape homes with native trees, shrubs and other plants and/or encourage homeowners to do so.

13. Encourage homeowners to keep pet cats indoors or, if taken outside, kept on a leash or inside a fenced area.

14. In forested areas reserved from development, promote the development of a diverse forest understory by removing livestock from forested areas and controlling white-tailed deer populations. Do not mow the forest understory or remove woody debris and snags.

15. Afforestation efforts should target a) riparian or streamside areas that lack woody vegetative buffers, b) forested riparian areas less than 300 feet wide, and c) gaps or peninsulas of nonforested habitat within or adjacent to existing FIDS habitat.

FIDS CONSERVATION WORKSHEET

Parcel size	_____	total acreage
	_____	Critical Area acreage

Existing

Forest cover	_____	total contiguous acreage
Forest cover	_____	total acres CA
FIDS habitat*	_____	total acres CA
FIDS interior	_____	acres CA

Calculate interior by subtracting out a 300 ft. edge.**

If available:	_____	acreage of contiguous forest area both in and out of the CA within a 3-mile radius.

Post development

Forest cover	_____	total acres CA
FIDS habitat	_____	total acres CA
Interior habitat remaining	_____	acres CA
Interior acreage		

<u>*How to Identify FIDS Habitat</u>

Assume FIDS habitat is present if a forest meets either of the following minimum conditions:

Forests at least 50 acres in size with 10 or more acres of forest interior (see below to calculate interior) habitat. The majority of the forest tracts should be dominated by pole-sized or larger trees (5 inches or more in diameter at breast height), or have a closed canopy; or

Riparian forests at least 50 acres in size with an average total width of at least 300 feet. The stream within the riparian forest should be perennial, based on field surveys or as indicated on the most recent 7.5 minute USGS topographic maps. The majority of the forest tracts should be dominated by pole-sized or larger trees, or have a closed canopy.

In lieu of using the above criteria for determining if FIDS habitat is present, a FIDS survey may be done by a qualified FIDS observer. See page 12 of the Guidance Document for the procedures to be followed. You may contact the Maryland Department

of Natural Resources, Forest Wildlife Divisions or the Critical Area Commission for a list of qualified observers.

****How to Measure the amount of forest interior and forest edge**

To determine the amount of interior in a forest, the edge of 300 feet is subtracted from the total contiguous forest. The area left is forest interior provided it is at least ten acres in size.

When measuring forest edge, do not include natural forest edges such as those adjacent to open water, nonforested wetlands and streams. Riparian forests of 300 feet or greater are considered interior habitat when calculating FIDS habitat in the Critical Area provided that they have a minimum of 50 contiguous acres or are connected to a forest that has been determined to be FIDS habitat.

Please answer the following questions regarding the FIDS *Site Design Guidelines* and how they were applied to the project.

1. Has development (e.g., house, septic reserve areas, driveway) been restricted to nonforested areas? Yes____No____

   If no, explain

   _____

   _____

2. If development has not been restricted to nonforested areas, has development been restricted to:

   a. perimeter of the forest within 300 feet of the forest edge? Yes____No____
   b. thin strips of upland forest less than 300 feet wide? Yes____No____
   c. isolated forests less than 50 acres in size? Yes____No____
   d. portions of the forest with low quality FIDS habitat, (e.g., areas that are heavily fragmented, relatively young, exhibit low structural diversity, etc.)? Yes____No____

3. Have new lots been restricted to existing nonforested areas and/or forests as described in #2 above? Yes____No____

   If no, please explain how property owners will be prevented

from clearing in the FIDS habitat on their property (i.e., protective covenants/easements)?

_____

_____

4. Will forest removal be limited to the footprint of the house and that which will be necessary for the placement of roads and driveways? Yes____No____

5. Have the number and lengths of roads been minimized? Yes____No____

6. Have the width of roads and driveways been reduced to 25 feet and 15 feet respectively? Yes____No____

   If no, explain

   _____

   _____

   _____

7. Will the forest canopy be maintained over roads and driveways? Yes____No____

8. Will the forest canopy be maintained up to the edge of roads and driveways? Yes____No____

9. Will at least 80% of the forest interior be maintained after development? Yes____No____

   If no, indicate percentage of forest interior that will be maintained? _____%

10. Are there special conditions on the site that limit where houses and other development activities may be located such as wetlands, steep slopes, etc.? If so, please identify and explain.

    _____

    _____

    _____

11. Do you believe that the ***Site Design Guidelines*** have been followed and that FIDS habitat has been conserved on this site? Yes____No____

MITIGATION REQUIREMENTS

If the *Site Design Guidelines* have been followed the required mitigation will be the creation of FIDS habitat equal to the acreage being directly cut or disturbed. (See pages 27 - 28 for specific mitigation options and criteria.)

Enter acreage of FIDS habitat that is being directly impacted _____acres.

THIS IS YOUR MITIGATION REQUIREMENT WHEN THE SITE DESIGN GUIDELINES ARE FOLLOWED.

If the *Site Design Guidelines* have not been followed complete the following.

A. Pre-development FIDS habitat _____ acres.
B. Post development FIDS habitat _____ acres.
C. Pre-development FIDS habitat interior _____ acres.
D. Post development FIDS habitat interior _____ acres.
E. FIDS habitat being directly impacted _____ acres.
(Subtract B from A)
F. Interior lost due to development _____ acres.
(Subtract D from C)
G. Multiply F. times two (2) _____acres and add to E. = _____ acres.

THIS IS YOUR MITIGATION REQUIREMENT WHEN THE DEVELOPMENT GUIDELINES HAVE NOT BEEN MET.

APPENDIX E

RESOURCES FOR LOCATING MITIGATION SITES

In order to assist local jurisdictions in the implementation of the FIDS guidance and the recommendation that forest habitat mitigation be required whenever impacts to FIDS habitat take place onsite, the following State and local programs are outlined. Each of the following programs may be used by local governments, planning staff, landowners and developers to identify appropriate mitigation sites for FIDS habitat planting and protection of existing FIDS habitat. The State Critical Area staff are available to assist in the identification of the most appropriate program for meeting mitigation requirements.

The Green Infrastructure Network (MD Department of Natural Resources):

Using Geographic Information Systems principles and landscape ecology, DNR has mapped an interconnected network of natural lands across the State described as "hubs" and "corridors" that are prioritized for conservation and restoration activities based on their ecological significance (e.g., large contiguous areas of forest, sensitive species, important wetlands or stream, etc.) and the level of threat (e.g., protection status, development pressures, etc.). The goal of the Green Infrastructure Assessment is to help identify an ecologically sound open space network and ultimately, to incorporate this valuable network into State and local land conservation planning efforts.

Green Infrastructure areas have been identified on public and private lands throughout the State through a series of maps and a database developed by DNR. Because only limited Statewide data is available to define this network, the help of local governments, land trusts, citizens and scientific experts is needed in this cooperative endeavor to further refine and identify the Green Infrastructure land network and effectively incorporate this information into State and local planning efforts.

The purpose of the Green Infrastructure land network is to create a coordinated Statewide approach to land conservation and restoration that will identify and protect lands with important ecological and biodiversity characteristics; address problems of forest fragmentation, habitat degradation and water quality; maximize the influence and effectiveness of public and private land conservation investment; promote shared responsibility for land conservation between public and private sectors and guide and encourage compatible uses and land management practices.

In addition, the Green Infrastructure land network could be used by local governments or developers to identify areas where FIDS mitigation, either habitat creation or protection, will achieve the goal of creating or enhancing viable FIDS habitat and be the most valuable. When refined on the local level, the Green Infrastructure Assessment may be useful in assessing the

potential natural resource related impacts of a proposed development and in identifying opportunities for natural resources and habitat enhancement activities.

CONSERVATION EASEMENTS

For the purpose of protecting and maintaining FIDS habitat, conservation easements should meet the following minimum conditions:

* The agreement should be between the property owner (grantor) and the local government and/or a land conservancy group (grantees).
* Restrictions on the property include the loss of development rights for the construction of houses and other structures.
* New agricultural activities are prohibited, (i.e., clearing, draining, construction).
* Any harvesting of timber must be done under an approved Timber Harvest Management Plan that would include a review for impacts to FIDS habitat.
* Recreational activities may be allowed provided they do not alter the character of the forest and do not cause undue disturbance during the breeding season.
* The easement shall be created in perpetuity.

Conservation easements should be held by either a local government agency and/or a local land trust that is willing and able to monitor compliance with agreements. An ideal situation is for both a local government agency and local land trust to jointly hold an easement on a property and be responsible for its enforcement. Often local land trusts are better set up than government agencies to monitor the easements for which they are responsible. There are approximately 40 local land trusts in Maryland.

The hub and corridor information and maps that have been developed at the State and regional level will be available to local governments and can be used to identify target areas that may be best suitable for targeting FIDS mitigation.

Contact:
Ms. Teresa Moore, Executive Director
Maryland Greenways Commission
Chesapeake Coastal and Watershed Service
Tawes State Office Building, E-2
Annapolis, MD 21401
(410) 260-8780
FAX (410) 260-8709

Rural Legacy

The mission of the Rural Legacy Program is to protect regions rich in a multiple of agricultural, forestry, natural and cultural resources that, if conserved, will promote resource-based economies, protect green belts and greenways and maintain the fabric of rural life. The Rural Legacy Program provides the focus and funding necessary to protect large contiguous tracts of land and other strategic areas from sprawl development and enhance natural resources, agricultural, forestry and environmental protection through cooperative efforts among State and local governments and land trusts. Protection is provided through the acquisition of easements and fee estates from willing landowners and the supporting activities of Rural Legacy Sponsors and governments.

Application for Rural Legacy Program grants may be made by a Sponsor (defined as one or more local governments, or land trusts endorsed by local governments) to the Rural Legacy Board. The applications include a description of the area, an identification of existing, protected lands and the anticipated level of initial landowner participation in the program, a Rural Legacy Plan complying with the Rural Legacy criteria and a proposed grant amount.

Contact:
Rural Legacy Program
Department of Natural Resources
Program Open Space
Tawes State Office Building, E-4
Annapolis, MD 21401
(410) 260-8403

Critical Area Forest/FIDS Mitigation and the Conservation Reserve Enhancement Program (CREP):

In some counties, fee-in-lieu monies could be used to plant trees and purchase easements in conjunction with the U.S. Department of Agriculture Conservation Reserve Enhancement Program (CREP). CREP is a nationwide program that promotes the planting of streamside buffers and the restoration of wetlands on agricultural land by offering financial incentives to landowners who voluntarily remove land from agricultural production for a period of 10-15 years. A recent component of this program is also the purchase of perpetual easements on qualifying lands. This is where the greatest potential exists for CREP and the Critical Area Program to combine forces to create and protect FIDS habitat. CREP will only pay for the first 150 feet adjacent to a waterbody. An area planted with Critical Area monies would be located landward of the 150-foot CREP forested buffer.

Planting Forested Buffers

The benefits offered to property owners would match the CREP bonus payments and cost-share. An area planted with Critical Area monies would be located landward of the 150-foot CREP forested buffer. Both the CREP and the Critical Area portions would be put in a perpetual easement to be held and enforced by the local Soil Conservation District (SCD), local land trust, or DNR. The benefits to the local Critical Area Programs include:

The identification of forest/FIDS mitigation sites in the Critical Area to fulfill mitigation requirements and ensure no net loss of forest.

Monitoring and enforcement of the mitigation sites would be in the hands of the Soil Conservation District, land trusts, or DNR, taking some burden off of the counties and helping to ensure that the trees are planted and survive.

Purchase of Easements on Existing Forest

Fees-in-lieu above the 1:1 mitigation ratio can be used for creative projects that help to restore/protect habitat and water quality. The monies could be used to purchase easements on forested areas in the Critical Area that are contiguous or near a CREP easement site.

Process

Some county planners are looking for ways to spend fee-in-lieu money. Local landowners may be interested in planting more acreage than is provided under CREP. In order to merge these two interests, local planners need to maintain communication with the Soil Conservation District and local land trusts so that interested landowners can take advantage of this additional funding source.

In some jurisdictions, county planners are looking for ways to spend fee-in-lieu and forest mitigation money. Local landowners may be interested in planting more acreage than is provided under CREP. In order to merge these two interests, local planners can be contacted to see whether there is any money available for interested landowners.

1. Landowner contacts local NRCS/SCD office or works with a local land trust regarding CREP contract and easement.

2. Landowners interested in obtaining this additional funding should contact their county Critical Area planner to find out if there are any funds available.

3. If money is available and the landowner decides to utilize Critical Area money for tree planting and an easement, then the landowner would go through the normal easement

process (negotiate easement lines with DNR staff, submit easement applicant via local partner, receive bonus payment from the Board of Public Works in conjunction with a check from the local government for tree planting and easement, easement is executed and recorded).

4. Long-term monitoring and stewardship would be handled by DNR and a local partner (land trust, SCD).

Payments

For a county to combine FIDS mitigation with CREP, the fee-in-lieu amount charged to those property owners that cannot mitigate on-site would have to be comparable to the rates paid out by the CREP program. CREP pays up to 100% of the cost of tree buffers in addition to a bonus payment for every acre of trees restored and placed under a permanent easement. The bonus payment ranges, based on the county, from $693 to $2,716 per acre.

To learn more about the CREP program, landowners should contact their local NRCS office. To learn more about the easement, contact Jeff Horan, Deputy Director of Forest, Wildlife and Heritage at DNR.

State Highway Administration

A local government or a project applicant can contact the Maryland State Highway Administration (SHA) to see if they have information on sites within a particular watershed or county. They often will have property owner information for potential mitigation sites and knowledge on whether an owner is interested in selling or not. They will also sell any extra acreage from their own mitigation (usually wetland) sites, resulting from SHA project impacts. These sites will not always be forested, but in many cases they are.

Contact:
Todd Nichols
Phone: 410-545-8628
FAX: 410-209-5003
E-mail: tnichols@SHA.state.md.us

Maryland Land Trusts:

There are a number of active land trusts throughout the State of Maryland whose goals and objectives include permanent protection of natural resources areas through the use of land conservation tools such as conservation easements and land purchase. The following list of Maryland Local Land Trusts in the State is updated regularly by the Maryland Environmental Trust.

Contact:
Nick Williams
Maryland Environmental Trust
100 Community Place, First Floor
Crownsville, MD 20132
(410) 514-7907
FAX: (410) 514-7919

What is a land trust?

A land trust is nonprofit organization devoted to land preservation. It can be private, nonprofit or public, like MET. Nationwide, land trusts assist conservation-minded property owners to preserve natural areas, farms, forests and scenic openspace without giving up ownership. Property owners that work with land trusts to protect their land have made a voluntary decision to preserve the beauty of their land, forever.

Your Local Land Trusts

In 1988, the Maryland Environmental Trust (MET) developed the Local Land Trust Assistance Program to assist citizen groups in formation and operation of land trusts by offering training, technical assistance, administrative and project grants and membership in the Maryland Land Trust Alliance. Today, the program works with over 40 private nonprofit land trusts. These land trusts can hold conservation easements independently or jointly with MET (currently 40,000 acres are co-held between a local land trust and MET). In addition, some of these land trusts acquire and manage land.

Many people want to have their conservation easements co-held by a local land trust. See below for list. MET can advise you as to which organizations work in your area.

MARYLAND LOCAL LAND TRUSTS

Organization	Address	Daytime Phone
Accokeek Foundation	3400 Bryant Point Road Accokeek, MD 20627	(301) 283-2113
American Chestnut Land Trust	Box 204 Port Republic, MD 20676	(410) 586-1570
Annapolis Conservancy Board	160 Duke of Gloucester St. Annapolis, MD 21401 20627	(410) 263-7949
Bay Ridge Trust	9 Lawrence Avenue Annapolis, MD 21403	(410) 626-0342

Broad Creek Conservancy	1201 Swan Harbor Circle Broad Creek, MD 20744	(301) 292-6318
Calvert Farmland Trust	P.O. Box 3448 Prince Frederick, MD 20678	(410) 414-5070
Carroll County Land Trust	P.O. Box 2137 Westminster, MD 21157	(410) 848-9172
Caves Valley Land Trust	2522 Caves Road Owings Mills, MD 21117	(410) 244-7656
Cecil Land Trust	2522 135 East Main St. Elkton, MD 21921	(410) 392-9667
Central Maryland Heritage League	P.O. Box 721, Middletown, MD 21769	(301) 371-7090
Chesapeake Habitat Restoration Trust	13630 Georgia Avenue Silver Spring, MD 20906	(410) 991-7011
Conservancy for Charles County	1170 Overlook Accokeek, MD 20607	(301) 283-2410
Cove Point Natural Heritage Trust	18-T Ridge Road, Greenbelt, MD 20770	(301) 345-6390
Eastern Shore Land Conservancy	P.O. Box 169 Queenstown, MD 21658	(410) 827-9756
Franklintown Land Trust	5100 Maple Park Avenue Baltimore, MD 21207	(410) 448-0779
Greater Sandy Spring Green Space	20120 New Hampshire Ave Brinklow, MD 20862	(301) 774-6135
Gunpowder Valley Conservancy	16940 York Road, Suite 201, Monkton, MD 21111	(410) 329-8074
Harford Land Trust	P.O. Box 385 Churchville, MD 21028	(410) 836-2103
Harpers Ferry Conservancy	P.O. Box 1350 Harpers Ferry, WV 25425	(304) 535-9961
Howard County Conservancy	P.O. Box 175 Woodstock, MD 21163-0175	(410) 465-8877
Kensington Land Trust	P.O. Box 602 Kensington, MD 20895	(301) 933-8756

Land Preservation Trust	Exec. Plaza 1 11350 McCormick Rd Hunt Valley, MD 21031	(410) 771-9900x106
Long Green Valley Conservancy	12815 Kanes Road Glen Arm, MD 21057	(410) 592-2381
Lower Shore Land Trust	213 Downtown Plaza, City Center, Suite 305 Salisbury, MD 21801	(410) 341-6575
Magothy River Land Trust	P.O. Box 126 Severna Park, MD 21146	(410) 233-1660
Manor Conservancy	P.O. Box 448 Monkton, MD 21111	(410) 659-1315
Maryland Mountain Trust	P.O. Box 604 Grantsville, MD 21536	(301) 334-3963
Monocacy Watershed Conservancy	P.O. Box 4253 Frederick, MD 21705	(301) 663-9303
Mt. Washington Preservation Trust	1807 South Road Baltimore, MD 21209	(410) 466-4270
North County Land Trust	7605 Bay St. Pasadena, MD 21122	(202) 261-1614
Patuxent Watershed Land Trust	8508 Timber Pine Court Ellicott City, MD 21043	(410) 418-5222
Patuxent Tidewater Land Trust	P.O. Box 1955 Leonardtown, MD 20650	(301) 475-1795
Potomac Conservancy	1730 North Lynn St, Ste 403 Arlington, Virginia 22209	(703) 276-2777
Prettyboy Watershed Preservation Society	4318 Beckeysville Road Hampstead, MD 21074	(410) 239-3524
Rockburn Land Trust	6560 Belmont Woods Road Elkridge, MD 21227	(410) 467-7774
Save Historic Antietam Foundation	P.O. Box 550 Sharpsburg, MD 21782	(301) 790-2800x298
Severn River Land Trust	P.O. Box 2008 Annapolis, MD 21404	(410) 424-4000

South County Conservation Trust	P.O. Box 82 Churchton, MD 20733	(410) 867-1756
South Mountain Heritage Society	P.O. Box 509 Burkittsville, MD 21718	(301) 834-7851
Stronghold Corporation	Dickerson, MD 20842	(301) 874-2024
Tree-Land Foundation	P.O. Box 535 Myersville, MD 21773	(301) 663-1122
Western Shore Conservancy FPNA	2808 Church Road Bowie, MD 20721	(301) 390-0797
Wildlife Land Trust/CWS	17308 Queen Anne's Bridge Rd. Bowie, MD 20716	(301) 390-7010
Woodland Committee Land Trust	2403 W Rogers Avenue Baltimore, MD 21209	(410) 367-8855

APPENDIX F

CONSERVATION EASEMENTS

For the purpose of protecting and maintaining FIDS habitat, conservation easements should meet the following minimum conditions:

* The agreement should be between the property owner (grantor) and the local government and/or a land conservancy group (grantees).
* Restrictions on the property include the loss of development rights for the construction of houses and other structures.
* New agricultural activities are prohibited, (i.e., clearing, draining, construction).
* Any harvesting of timber must be done under an approved Timber Harvest Management Plan that would include a review for impacts to FIDS habitat.
* Recreational activities may be allowed provided they do not alter the character of the forest and do not cause undue disturbance during the breeding season.
* The easement shall be created in perpetuity.

Conservation easements should be held by either a local government agency and/or a local land trust that is willing and able to monitor compliance with agreements. An ideal situation is for both a local government agency and local land trust to jointly hold an easement on a property and be responsible for its enforcement. Often local land trusts are better set up than government agencies to monitor the easements for which they are responsible. There are approximately 40 local land trusts in Maryland.

INFORMATION REQUIRED FOR MITIGATION SITE DEVELOPMENT PLAN

1. A brief description of mitigation requirements based on the associated development project and how the mitigation plan will meet these requirements.

2. A brief description of the FIDS habitat that is being impacted including acreage, amount of interior lost, dominant tree and shrub species and aquatic and/or other features that help define habitat characteristics.

3. Include a site location map depicting the geographic relationship between the impact site and proposed mitigation site and a vicinity map with enough detail to locate the site for monitoring purposes.

4. Describe the existing land use and ownership, adjacent land use and position in the landscape in relation to other forest tracts.

5. Describe the proposed plant communities that will be created/protected. If creating FIDS habitat, indicate if natural regeneration or plantings will be used.

6. If natural regeneration is proposed, describe the likely seed source, any site or soil preparation that will be undertaken, control measures for invasive species, measures to protect from wildlife grazers, etc.

7. If planting, provide a list of trees and shrubs to be planted, planting densities, control measures for invasive species, measures to protect from wildlife grazers and soil and/or site preparations, watering regime, etc.

8. Provide assurance of the legal right to use the proposed property for mitigation (e.g., letter of intent, option to purchase, etc.).

9. Indicate who will be responsible for monitoring and a description of information that will be provided in the monitoring reports.