



Wildlife Friendly Development Certification Handbook

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INTRODUCTION

The Wildlife Friendly Development Certification program is a new collaboration between the NC Wildlife Resources Commission (NCWRC), NC Wildlife Federation (NCWF) and the NC chapter of the American Society of Landscape Architects (NCASLA). Developers can use this voluntary program to market their Wildlife Friendly Development to homeowners who truly value the protection of natural resources. The Wildlife Friendly Development Certification program implements strategies outlined in the NC Wildlife Action Plan and expands upon green building standards that are becoming normal components of building practices in North Carolina.

The Wildlife Friendly Development Certification program is a voluntary program designed to formally recognize residential developments where developers have gone above and beyond current rules and regulations to protect wildlife habitat and reduce environmental impacts. As the population of North Carolina continues to increase and more land is developed, it is imperative to minimize impacts to fish, wildlife, and their habitats. This program is designed to get developers and biologists talking early and to identify important natural resources prior to beginning a new development project. Within the program, development projects are evaluated using criteria that cover everything from wetland protection and stream crossings to trail design and landscaping.

This program has the potential to protect priority wildlife habitat while increasing property values and enhancing quality of life for residents. The program:

- Recognizes residential land developers who promote the conservation of wildlife habitat and use environmentally sound development practices.
- Allows homeowners to be confident that, by living in a Certified Wildlife Friendly Development, they are helping protect wildlife and their habitats.
- Benefits wildlife by protecting, connecting, and enhancing habitats on site.

This Wildlife Friendly Development Handbook will take you through the steps to create a Certified Wildlife Friendly Development. The handbook serves as a guide to the Criteria Form, a Microsoft Excel worksheet that tracks the progress of a development toward certification. The handbook also gives an overview of how the program is administered and describes each of the criteria in detail.

CERTIFICATION PROCESS

Summary

The Wildlife Friendly Development Certification (WFDC) program recognizes developments that meet high standards for wildlife and habitat protection during all phases of development. A Certified Wildlife Friendly Development must meet a sufficient number of criteria that address various aspects

of development from design and construction through to completion. The criteria for WFDC were designed to ensure that sufficient measures are taken to conserve wildlife habitats during development. Each development is different, therefore, not all criteria for WFDC are applicable for every development, and developments of a variety of sizes and with a diversity of site conditions are eligible for certification. Some criteria have required components, most reward applicants for efforts to be wildlife friendly, and some provide extra credit points. Each criterion is thoroughly described in subsequent sections of this handbook.

The first step for anyone interested in WFDC is to obtain the most recent version of the WFDC Criteria Form, which is a Microsoft Excel spreadsheet. The Criteria Form is available through the official WFDC website: www.ncwildcertify.org. Prospective applicants should familiarize themselves with the requirements and criteria found in the Criteria Form and described in this handbook. Additional contact information and news is available on the WFDC website.

A Review Team comprised of NC Wildlife Resources Commission biologists and NC Wildlife Federation members work with applicants during the certification process. The Pre-Design Checklist must be completed and materials submitted for the Review Team to thoroughly understand the current conditions of the development tract. Once completed, the Review Team will set up an Initial Consultation to discuss the Pre-Design Checklist with the applicant. The next step in the process is to complete the Requirements Section and the first section of the Scoring Criteria: Section I – Development Conservation Design. Criteria in Section I assess the applicant’s plans for the development and provisions made for wildlife during the planning process. Section II – Development Construction and Post-Construction assesses conditions during the construction process, evaluates measures to minimize impacts during construction, and also covers the period after construction. If required criteria are met and sufficient points are earned for Section I and Section II criteria, the development will become a Certified Wildlife Friendly Development. After the development is certified, homeowners will be responsible for maintaining certification.

WFDC Criteria Form

The WFDC Criteria Form is a Microsoft Excel spreadsheet that is available through the WFDC website. The Criteria Form is populated by the applicant; this lets the applicant monitor progress toward certification and make necessary adjustments to ensure sufficient points are earned to continue the certification process. Not all criteria are applicable for every development. For example, if a development tract does not contain any streams or wetlands, criteria related to these features and their buffers will not apply.

The Criteria Form contains nine worksheets: Applicant Information, Pre-Design Checklist, Background Information, Initial Consultation, Requirements, Priority Habitats, Scoring Criteria I – Development Conservation Design, Scoring Criteria II – Development Construction and Post-Construction, and Score Summary. These worksheets are described in more detail starting on page 12 of the handbook. These are arranged so that the applicant completes them from left to right, following the chronology of certification.

Several worksheets, beginning with the Background Information worksheet, use black cells with a white font (Figure 1). All other parts of the worksheets are password-protected to ensure that the

applicant does not accidentally alter parts of worksheets that should not be changed. Applicants only need to populate black cells with white fonts; other cells are automatically populated.

27	What is the total length (feet) of ephemeral stream channels on the tract?	500
29	Are there any jurisdictional wetlands on the tract?	yes
31	Acreage of jurisdictional wetlands on the tract?	8.85
33	What is the size of the development footprint? (calculated; tract - natural areas & open space)	104
35	What is the total acreage of individual lots?	100

Figure 1. Screen capture of a portion of the Background Information worksheet. Applicants only populate black cells with white fonts, such as those within the red circle.

How to Complete the Criteria Form

The Criteria Form is designed to limit the number of cells that must be populated by the applicant throughout the worksheets. The applicant only needs to enter information if the cell is black with a white font; the other cells are populated by the Review Team.

The applicability of a criterion is determined in Column I of the Scoring Criteria worksheets. The default value for all criteria is ‘1’. In most cases, this process is automated. However, applicants can change black cells with white fonts from ‘1’ to ‘0’ if the criterion is not applicable (Figure 2). If the cell for the applicability value is white, that criterion’s applicability cannot be changed.

		Actual Points	Max. Points	Applicable? Yes=1 No=0	Applicable Points
B. Regulatory Compliance					
1. Does development comply with all DWQ, ACE, or DCM rules and regulations without any violations? Yes = 0 No = - 5	yes	0	0	1	0
2. Do construction activities avoid moratoria described in permit conditions? If yes, 5 points, if no, 0 points	yes	5	5	1	5

Figure 2. Screen capture showing an applicable cell that can be changed by the applicant (black cells, white font) and one that cannot be changed (white cell, black font).

The Maximum Points category in Column H of the two Scoring Criteria worksheets indicates the maximum number of points that can be earned for each criterion. The maximum point values vary and were derived to help ensure that the most important habitat features are conserved. If the Applicable column (Column I) has a value of ‘1’, the Maximum Points (Column H) and the Applicable Points (Column J) are equal. If the criterion does not apply, the Applicable Points column value will be ‘0’. In a few cases, such as criterion I. D. 1. related to natural areas, an applicant can earn more points than the maximum number of points. In the case of I. D. 1., the maximum points is set at 6, which represents 50% of the land in the development tract being set aside as a natural area. The absolute maximum for this criterion is 11 points, but this would require 100% of the development tract to be set aside as a natural area. The maximum point level of 6 is a more practical maximum; applicants will be rewarded for exceeding 50% or 6 points.

Certification Scoring

For each of the two sections of the Scoring Criteria, an applicant must accumulate at least 50 % of the applicable points. If an applicant cannot earn 50 % of the applicable points from each section, the certification process ends. Information on the Score Summary worksheet clearly indicates the number

of points required for each section and whether or not sufficient points have been accumulated to continue the certification process (Figure 3).

	Actual	Required	
	Points	Points	
I. DEVELOPMENT CONSERVATION DESIGN	74.8	73.8	sufficient points for Section I
II. DEVELOPMENT CONSTRUCTION	29.5	32.0	more points needed for Section II
EXTRA CREDIT POINTS:	16.8		
Total points required for certification:	116.4		
Total applicable points:	211.6		more points needed to be certified
Total points for this development:	121.2		
Percent Score:	57.3%		

Figure 3. Screen capture of the Score Summary worksheet. In this example, the applicant cannot be certified because more points are needed from Section II.

To receive certification, the applicant must accumulate 55% of the applicable points from Sections I and II combined. This requirement is in addition to the 50% requirement for each individual section. This 55% overall requirement can be met in several ways. If 55% or more of the applicable points are gained from both sections, the applicant will be certified. If only one section has over 55% of the applicable points but the average of the two sections exceeds 55%, the applicant will be certified. Lastly, extra credit points can be earned to reach the 55% requirement. There are numerous opportunities for extra credit points in Section I; many relate to restoration opportunities. Extra credit criteria do not contribute to the 50% requirement for each section, but can help the applicant reach the 55% overall requirement. Extra credit points are tallied in Column K of both Scoring Criteria worksheets.

Initial Consultation

The Initial Consultation (IC) is a meeting and site visit for the applicant and the Review Team. A member of the Review Team will contact the applicant within 30 days of receiving a complete Pre-Design Checklist to set up the IC. After the IC, the Review Team will compile recommendations using the Initial Consultation worksheet of the Criteria Form and send it to the applicant to ensure that all parties agree with the recommendations made during the IC.

The IC is an opportunity for the Review Team to make suggestions to the applicant to 1) help them earn additional points by making adjustments to the placement of developed areas, 2) ensure conservation of priority conservation areas, 3) resolve any conflicting issues, and 4) help with case-specific decisions about areas to be developed or conserved. Other items that may be discussed during the IC include: opportunities for habitat restoration, wildlife corridors, wildlife passages, invasive vegetation removal, road placement and clustering, and layout of recreational amenities such as fishing access areas and trails. Some criteria in Section I are tied to the IC; more points are awarded if the applicant adheres to recommendations made during the IC. For instance, wildlife corridors and wildlife passages could be recommended during the IC and the applicant earns points for following the Review Team's recommendations.

Fee Structure

Consultation and Application Fees

Two fees are required for certification. A nonrefundable Consultation Fee of \$2,000 is required when the Pre-Design Checklist is submitted. This fee is the same for all applicants regardless of development size. An Application Fee is required when Section I of the WFD Criteria Form is submitted. This fee must be received before a development can be promoted using the terms described in the Promotional Materials section on page 10. The Application Fee is scaled based on the size of the development with larger developments paying higher Application Fees (Table 1). The Application fee is \$75 per acre with a maximum of \$48,000. This fee is partially refundable if the developer is unable to earn enough points in Section II and therefore is unable to be certified even though Section I was satisfactorily completed. Partial refunds will be based on the amount of time elapsed from receipt of the application as follows: elapsed time 1 year or less – 75% refund, elapsed time between 1 and 2 years – 50% refund, elapsed time over 2 years – 25% refund. The Consultation and Application Fees should be made payable to the NC Wildlife Federation.

Table 1. Fee schedule showing Consultation, Application and Annual Renewal Fees.

Development Size Acres	Consultation Fee Dollars	Application Fee Dollars	Total Certification Cost Dollars	Annual Renewal Fee Dollars	Multi-Year Renewal Fee Dollars
5	\$2,000	375	\$2,375	\$200	\$540
10	\$2,000	\$750	\$2,750	\$200	\$540
25	\$2,000	\$1,875	\$3,875	\$200	\$540
50	\$2,000	\$3,750	\$5,750	\$288	\$776
100	\$2,000	\$7,500	\$9,500	\$475	\$1,283
200	\$2,000	\$15,000	\$17,000	\$850	\$2,295
350	\$2,000	\$26,250	\$28,250	\$1,413	\$3,814
500	\$2,000	\$37,500	\$39,500	\$1,975	\$5,333
600	\$2,000	\$45,000	\$47,000	\$2,350	\$6,345
750	\$2,000	\$48,000	\$50,000	\$2,500	\$6,750
1000	\$2,000	\$48,000	\$50,000	\$2,500	\$6,750

Annual Renewal Fee

After a development becomes a Certified Wildlife Friendly Development, an Annual Renewal Fee is necessary to ensure continued compliance. This fee is also scaled based on the size of the development and is equal to 5% of the total certification cost. The first Annual Renewal Fee will be due 1 year after the development is certified. Once the development is complete, the homeowners association will be responsible for paying the Annual Renewal Fee to maintain certification.

The homeowners will also be responsible for maintaining habitat conservation in the development at the time of certification. If conditions in the development change, such as a natural area being converted to a recreational field, the development will be rescored based on current conditions. If the development loses points but still has enough points to be certified, the development will maintain certification. If the development loses too many points to maintain certification, we will work with the homeowners association to make necessary changes to retain certification. If the development does

not pay the Annual Renewal Fee or the development can no longer be certified, all references to Wildlife Friendly Development Certification will have to be removed and the development can no longer be referred to as a Certified Wildlife Friendly Development.

How Revenues are Used

Consultation and Annual Renewal fees will be used to offset expenses incurred when reviewing applications, leading the Initial Consultations, and conducting annual reviews. Application Fees will be used by the NCWF and the NCWRC to implement the NC Wildlife Action Plan. Wildlife Action Plan projects may include the purchase of conservation lands, active habitat management, public education, rare species studies, and habitat enhancement.

Phased Developments

Often developers complete developments in phases rather than complete an entire development at one time. The following policies apply to developments that are completed in phases. Generally speaking, each phase of a development will be treated as an individual development but conditions in completed phases can be considered in subsequent phases. The Review Team prefers to discuss all phases of the development during the Initial Consultation when possible.

The applicant will need to discuss whether or not they plan to pursue certification for individual phases with the Review Team early in the process. If a project will be built in phases, there are three primary scenarios for certification:

- 1). The entire development (all phases) will be completed and certified at one time or the developer only wishes to go through the certification process once. This would include certifying multiple phases all at one time, or only certifying one phase of a multi-phase development.
- 2). The developer plans to develop in phases, owns all phases, and wishes to be certified phase by phase.
- 3). The developer falls under categories 1 or 2 above and later decides to add another phase to the development. This would include situations where the new development has a different name or perhaps is completed by a different developer.

The first and third scenarios are straightforward in that there would either be one certification or subsequent phases would be certified without considering previous phases. When the developer knows upfront that he plans to develop multiple phases over time, there is an opportunity to discuss multiple phases during the Initial Consultation. The advantage of discussing the entire development during the Initial Consultation is that there are more options for determining the best layout of the development given the wildlife habitat in the area. When multiple phases are planned, the Review Team prefers to discuss all phases during the Initial Consultation.

An applicant falling under scenario 2 above can count measures in completed phases when subsequent phases are evaluated. For example, at least 10 acres of natural areas must be set aside for a 100 acre tract. If the 100 acre tract is made up of two 50 acre tracts, the applicant can set aside 10 acres in phase 1 and no acres in phase 2 and potentially satisfy this requirement. However, the applicant cannot be

certified for phase 1 if they cannot earn sufficient points for phase 1 alone. With the previous example, the applicant could not conserve 10 acres in phase 2 and none in phase 1 and be certified for phase 1 before phase 2. The Review Team cannot be certain that any plans for subsequent phases will be carried out. Therefore, phases must qualify on their own, or in combination with completed phases to be certified.

If the applicant chooses to be certified in phases, he will need to submit a Consultation Fee and an Application Fee for each phase. The Review Team will set up an Initial Consultation for each phase. The Application Fee will be based on the acreage of each phase to be certified. Annual Renewal Fees will be based on the acreage certified; if multiple phases have been certified, the Annual Fee will be based on the cumulative acreage of certified phases.

Once a phase has been certified, the applicant can advertise that phase as a Certified Wildlife Friendly Development. However, the applicant cannot advertise others phases as certified; certification is tied to the particular phase that has been reviewed and certified.

Existing Developments

While the intent of the WFDC program is to be involved with developers from the start, we recognize that some existing developments may qualify for certification with this program. To recognize existing developments that have taken measures to protect wildlife habitat and reduce environmental impacts, the Review Team will accept applications from existing developments begun or completed prior to June 30, 2011. Existing developments will be considered for certification using slightly different criteria than new developments.

The main challenge with certifying existing developments is determining site conditions prior to development. It is practically impossible to determine what recommendations the Review Team might have made had we been involved with the development from the start. Additionally, it is unfair to new developments to hold existing development to lower standards. Considering this, the developer is responsible for providing supporting evidence about site conditions prior to development. If the applicant can sufficiently prove that the tract did not contain Priority Habitats, only 30% of the tract will be required to be set aside as natural areas. The Review Team will make the final determination as to whether the proof provided is sufficient. If the applicant cannot sufficiently prove that the tract did not contain Priority Habitat, we will assume there was Priority Habitat on site and require 40% of the tract to be conserved. If Priority Habitats are still found within the existing development, these areas are required to be conserved.

Some criteria will no longer apply for existing developments, such as those tied to the Initial Consultation. All requirements still apply; for example, applicants must have sufficient natural area buffers around wetlands and surface waters. The Review Team will continue to accept applications for existing developments after June 30, 2011, but any development that is started after this date will have to incorporate the Wildlife Friendly Development Certification program in the planning process from the beginning to be considered for certification.

Periodic Criteria Review

The WFDC program will be reviewed periodically by representatives of the NCWF, NCASLA, and NCWRC to determine if modifications to the program are needed. Modifications may include, but are not limited to, changes to the scoring criteria and requirements and changes to Consultation, Application and Annual Fees. Specific changes to the scoring criteria and requirements are impossible to predict but will help ensure that the program reaches the goals of protecting wildlife habitat and minimizing environmental impacts.

A development will be evaluated based on the Criteria Form being used at the time of application. If the criteria change over time, the development will still be evaluated using the Criteria Form applicable when the application was submitted. However, there will be a 5 year time limit to be certified; this time limit begins when the completed Pre-Design Checklist and Consultation Fee are received. If the development cannot be certified within 5 years of the application date, the applicant can reapply using the current criteria and submit a new Consultation Fee. Another Initial Consultation may be necessary.

Promotional Materials

Certified Wildlife Friendly Developments have the right to advertise using the Certified Wildlife Friendly Development logo. A list of certified developments and developments pursuing certification will be maintained on the official WFDC website – www.ncwildcertify.org. However, developments that have not yet been certified cannot use the Certified Wildlife Friendly Development logo or insinuate through written or spoken promotions that they have been certified in any way. Additionally, developers cannot use the certification of completed development phases to advertise or promote development phases that have not been certified.

Promotional materials should refer to the WFDC website – www.ncwildcertify.org. Until the Review Team has received a completed Pre-Design Checklist along with the Consultation Fee, the applicant cannot refer to Wildlife Friendly Development Certification in any way that may be considered advertising. Once the Review Team has received a completed Pre-Design Checklist and Consultation Fee, the applicant can advertise using the following phrases: **“plan to pursue Wildlife Friendly Development Certification”** and **“intend to participate in the Wildlife Friendly Development Certification program.”** Advertising material should be reviewed by the Review Team prior to public release.

Once sufficient points in Section I of the Scoring Criteria are earned, the applicant can advertise using additional phrases that indicate the applicant is closer to receiving certification. Phrases that can be used once Section I of the Scoring Criteria has been completed include: **“pursuing Wildlife Friendly Development Certification”**, **“participating in the Wildlife Friendly Development Certification program”** and **“applied for Wildlife Friendly Development Certification.”** Advertising materials should be reviewed by the Review Team prior to public release. At this point the applicant can advertise using the Wildlife Friendly Development logo without “Certified.”

Once sufficient points have been earned in Section II of the Scoring Criteria, the development can be certified. At this point the applicant can use the Certified Wildlife Friendly Development logo in advertising and refer to the development as a **“Certified Wildlife Friendly Development.”** Although the development is now certified, advertising material still should be reviewed by the Review Team

prior to public release. Keep in mind that only certified phases can be advertised as such; the applicant cannot insinuate that uncertified phases are certified in any way.

APPLICANT INFORMATION

Applicant Information is the first worksheet on the WFDC Criteria Form. This worksheet asks for basic information about the applicant and anyone that is helping the applicant pursue certification. Contact information for all consultants involved in the certification process should be included to facilitate communication with all involved parties. The WFDC form will be passed back and forth between the applicant and the Review Team throughout the certification process. This worksheet tracks progress toward certification and records milestone dates in the certification process.

PRE-DESIGN CHECKLIST

The Pre-Design Checklist asks the applicant to supply vital information that the Review Team needs to better understand the conditions on the tract of land to be developed. A completed Pre-Design Checklist enables the Review Team and applicant to be fully prepared to discuss the proposed development during the Initial Consultation.

Once a developer decides to pursue WFDC, he should begin collecting information required in the Pre-Design Checklist. Much of the information needed for the Pre-Design checklist is available as Geographic Information System (GIS) data from various sources. A Terrestrial Habitat Survey conducted on the development site can supply additional detailed information about the site that cannot be determined with remote sensing data. A developer should determine how many lots he wants in the development and develop a bubble diagram showing a general layout of the development. At this stage, it is best that the developer not devote much time or money to the specific location of lots and roads. This is because the best way for a development to qualify as wildlife friendly is to design the developed area based on an assessment of habitat from a site habitat survey and current conditions.

Once the Pre-Design Checklist is complete, the applicant should send the packet of information to the NCWF. The address for the NCWF's Charlotte Office is 2155 McClintock Road Charlotte, NC 28205.

The information packet should include a terrestrial habitat report, species occurrence report, and maps of the area. The NCWF will check the Pre-Design Checklist packet to ensure completeness. Once complete, NC Wildlife Resources Commission (NCWRC) staff will examine the materials and contact the applicant within 30 days of receiving the packet. NCWRC staff will set up a meeting with the applicant to discuss the development project. This face to face meeting, the Initial Consultation, will include a site visit to the development tract.

A Terrestrial Habitat Survey should be conducted by a qualified wildlife biologist or ecologist. The habitat survey is necessary to generate some of the products listed below. These products will inform

the Review Team and help guide subsequent design and construction activities. The completed Pre-Design Checklist will supply a **report** and a series of **maps** of the development tract and surrounding area. Maps in the form of a Geographic Information Systems (GIS) project are preferred.

A. Report

The report component of the Pre-Design Checklist should complement the maps by describing terrestrial habitat conditions, wetland acreage including type and quality, stream length including type, water quality designation and quality, and the locations of Federal or State listed species. When a map is needed for one of the topics listed in the Pre-Design Checklist, the report should include any needed details about that topic.

The report should describe any Priority Habitats identified on site during the Terrestrial Habitat Survey. The report is intended to help the Review Team understand information about the Priority Habitats that cannot be gleaned from looking at maps. Descriptions can assess habitat quality and include lists and coordinates of plant and animal species noted on site.

The report should also describe species occurrence information to ensure the conservation of habitats deemed necessary for the persistence of Federal and State listed species on site. Note that these criteria do not apply to species listed only as special concern. The report should include lists and coordinates of all Federal and State listed threatened & endangered species that were observed opportunistically during the Terrestrial Habitat Survey.

If listed species were not found during the habitat survey, the Review Team will assume the presence of Federal and State listed species habitat on site if previous records for such species exist within the site boundaries. If a listed species record is outside the site, but within 5 miles, consultation with the NCWRC or the US Fish and Wildlife Service (USFWS) will be required. If a record exists as described above, for a Federal or State listed endangered or threatened wildlife species, the applicant must consult the USFWS and/or the NCWRC regarding habitat conservation on site and must follow all recommendations by these agencies. Recommendations for Federally listed species will be based on existing USFWS recovery plans where they exist.

B. Maps

Maps are important for showing the location or spatial extent of a variety of conditions related to the development site. Point locations should be denoted as such on maps but any spatial data available in polygons should be mapped as such to retain as much detail as possible.

1. Natural Features

Maps should depict the location of various natural features on the development tract. The maps will be used during the Initial Consultation to guide conservation and design of natural areas, wildlife corridors, and other protected areas. Include a recent aerial photo of the development tract and neighboring parcels. If conditions have changed since the most recent aerial photo, a map should indicate current land use conditions.

Map any surface water features such as ponds, lakes, rivers, or streams. Wetlands and streams should have a Jurisdictional Determination (JD) and the boundaries of the JD should be mapped. All jurisdictional wetlands and streams should be delineated, mapped, and verified by the US Army Corps of Engineers, the NC Division of Water Quality, or the NC Division of Coastal Management as appropriate. Delineations should be performed using the accepted guidance from the state or federal agency with jurisdiction. Map intermittent and perennial streams along with 100 year floodplains when they are available.

Data layers below can be downloaded through the [NCWRC Green Growth Toolbox](#) website. If your development site occurs in one of the regions for which we have additional regional conservation data, include the regional habitat layers in this map.

- Significant Natural Heritage Areas
- Natural Heritage Element Occurrences
- NC WRC Game Lands
- Game Land Hunting Safety Buffer
- Managed Natural Areas
- Sub-Watersheds (14 digit HUCs) with Federally Listed Fish and Mussels
- One NC *Naturally* Biodiversity and Wildlife Habitat Assessment
- Floodplain (Note: Data must be downloaded from the NC Floodplain Mapping Program)
- Streams (Note: Map must display best available stream data. Where available, display LIDAR data. LIDAR data for western NC counties can be downloaded from www.ncstreams.org.)

All Priority Habitats determined during the Terrestrial Habitat Survey should be mapped as polygons. Terrestrial habitat maps will help the applicant and Review Team understand where Priority Habitats exist and how they are connected to adjacent habitats. In addition, if the Priority Habitat has a required core area surrounding it, the core area should be mapped. Core areas are presented as distances from the edge of the Priority Habitat and should be mapped as such.

Priority Habitats identified in the Wildlife Action Plan that do not appear below, such as raptor nests, or nesting habitat for other priority bird species, were excluded due to scientific expert opinion. Experts believe that these priority and special habitats are generally distributed throughout forests, are not readily identifiable or permanent and will be conserved by meeting WFDC criteria. In the case that more Priority Habitat exists on site than is required to be conserved for certification, the Review Team will prioritize the Priority Habitats using information presented in the Pre-Design Checklist such as the quality, size, and connectedness of Priority Habitats. In the case that Federally listed species are found on site, all pertinent regulations regarding habitat protection will apply and the entire core habitat must be protected. More details about these Priority Habitats can be found in Appendix A.

Priority Habitats (in general order of priority for conservation):

- Bat roosts, maternity colonies & hibernacula

- Bald Eagle nests
- Maritime forest
- Beaches and estuarine islands
- Caves and mines
- High elevation habitats
- Wetland habitats
- Rock outcrops
- Tree or structural bat roosts
- Longleaf pine forest
- Bottomland hardwood forest
- Barn owl nests
- Colonial waterbird active nesting colonies
- Chimney swift colonies
- Mature hardwood forest > 50 years old

Required Priority Terrestrial Habitat Conservation Certain species are protected by Federal law. Therefore the WFDC requires that no development take place within the core habitat area for these species. Federally protected species may be known to exist on the site or may be found during the habitat survey or a site visit. Federally protected species' habitat core areas are Priority Habitats which must be fully conserved (unless not recommended by USFWS or NCWRC biologists) and are not subject to the 40% Priority Habitat conservation threshold.

The location of Federal and State listed species observed on the development tract during the Terrestrial Habitat Survey should be included on the maps. Additionally, the applicant should include the location of historic records of any Federal and State listed species found within 5 miles of the development tract. For aquatic species, the applicant should include the location of any Federally listed species occurring within the same 14 Digit HUC(s) as the development.

For developments within the 20 Coastal Counties, applicants should include maps of Submerged Aquatic Vegetation (SAV) near the development site. Aerial photographs can be used to determine the extent of SAV in a given area. However, an on-site survey should be performed during the growing season to determine species distribution and percent of bottom coverage if in-water structures, docks or marinas are proposed.

The applicant needs to map the spatial extent of any building area constraints such as steep slopes or 100 year floodplains. Building area constraints are listed in I.B.1 of Scoring Criteria I and described later in the handbook.

2. Land and Water Classifications

All Significant Natural Heritage Areas (SHNA) that occur within the development track or on adjacent parcels should be mapped. Map the SHNAs as polygons showing boundaries and include a description in the report.

If there are easements on the development track or on adjacent parcels, map these as polygons. Easements may restrict the types of activities that can occur; this information is vital for

making decisions about the layout of the development. Additionally, map any publicly owned land adjacent to the development tract. Any managed areas near the development tract should be mapped. This includes any land used as mitigation and NCWRC Game Lands. For Game Lands, a 450' safety buffer should be mapped starting at the outer edge of the Game Lands.

If there are surface waters on site that have a special classification (Class SA, ORW, Trout Waters, etc.), these should be labeled on the map. Information on [surface water classifications](#) is available online. In addition, map the boundaries of the 14 Digit HUC (Hydrologic Unit Code) within which the development is located.

3. Restoration Opportunities

The location of existing barriers to aquatic movement such as dams, weirs, perched culverts or other in-stream structures should be mapped. These barriers can prevent the normal movements of aquatic organisms. Use recent aerial photos and on the ground surveys to document and map the locations of potential barriers. Recommendations for corrective actions will be made during the Initial Consultation.

Any areas that the applicant believes have the potential for restoration should be also be mapped. These areas will be investigated by the Review Team during the Initial Consultation to see if they are appropriate areas for restoration. Refer to section I. T. Restoration for the various restoration opportunities. One restoration opportunity is the removal and control of exotic, invasive vegetation. Aerial photos and on the ground surveys can help locate and determine the extent of infestations so they may be accurately mapped.

4. Existing Conditions

Understanding existing conditions on the development tract will help the Review Team and developer work together to determine the development design. Any man-made structures on the development tract such as existing roads and utility lines should be mapped. Roads and railroads are available as GIS layers. Also current aerial photos are useful for locating heavily used trails, logging roads and farm roads.

Any Superfund or hazardous waste sites on or near the development tract should be mapped. Contaminated sites should be remediated so that hazardous materials do not leave the site and affect surface or ground water. Areas that have had past commercial uses especially gas stations, junkyards, and any heavy industry should be thoroughly investigated. Any investigation should be coordinated with the NC Division of Waste Management.

Also include on the map any municipal water or sewer lines located on the property. If no waters lines are on the property but the applicant plans to connect to water or sewer lines, he should show the nearest water line connection point on a map. Existing infrastructure and previously disturbed areas should be utilized as much as possible. If water and sewer are available, the development should use it rather than private wells and septic systems. Some pipelines and electric transmission lines are available as GIS layers. Also current aerial photos are useful for locating sewer easements and maintained utility corridors. Municipal and county governments maintain maps and some GIS layers depicting sewer and waterline locations.

If the development is within one of the 20 Coastal Counties and coastal shorelines have been stabilized in the past, show these areas on a map. Use on-site surveys and aerial photos to document and map existing shoreline structures. Include a description or photos of the stabilizing structures and their extent in the report. Existing shoreline conditions help determine the potential effects of a proposed project. Existing docks, piers, boat houses, lifts, ramps, marinas, and bulkheads indicate varying amounts of disturbance. Certified Wildlife Friendly Developments are expected to utilize existing infrastructure as much as possible. Applicants are encouraged to improve shoreline conditions for the benefit of fish and wildlife resources. This may include, but not be limited to, using “living shoreline” techniques to stabilize erosion, remove vertical structures, utilize rock sills, reestablish marsh vegetation or enhance fish or shellfish habitat.

5. Bubble Diagram

The bubble diagram is a quick and easy way for the developer to indicate the location of access points, general development layout, and number of desired lots for the development. The bubble diagram gives the Review Team a good idea of the developer’s expectations for the development but it does not require much effort. It provides an appropriate level of detail for the early stages of the development process.

BACKGROUND INFORMATION

The applicant is asked to supply basic information about the development on the Background Information worksheet. Information on this worksheet will automatically populate cells in subsequent worksheets and determine whether or not criteria are applicable. This maintains consistency throughout the criteria and reduces the need for the applicant to determine whether or not criteria are applicable. Only black cells with white text can be altered on this worksheet; this applies to other worksheets as well. Other cells are password protected and will not need to be changed by the applicant.

INITIAL CONSULTATION

The Initial Consultation (IC) worksheet addresses requirements and scoring criteria that may be discussed during the IC. The number of points awarded for several criteria depends on what is recommended by the Review Team during the IC. For example, the applicant cannot receive credit for restoring habitat unless this is discussed during the IC and the Review Team explains the restoration conditions. Individual criteria will be discussed in the Requirements or Scoring Criteria sections.

The Initial Consultation worksheet is to be filled out by the Review Team; there are no fields to be completed by the applicant on this worksheet. This worksheet serves as a repository for any

discussions and decisions made during the Initial Consultation (IC). This ensures that all involved parties agree with the recommendations discussed during the IC. The Review Team will enter pertinent information on this worksheet and related cells in the Scoring Criteria worksheets will be automatically populated.

REQUIREMENTS

The WFDC program was designed to give applicants options to choose which measures to take to achieve certification. However, some criteria are required for certification. Failure to meet the requirements will end the certification process. A message reading “requirement met” will appear if the requirement is met.

1. Riparian Zones

What percentage of riparian buffers are set aside as natural areas and free of impacts?

Purpose: Intact, forested riparian zones provide many critical functions to streams and other surface waters such as temperature control through shading, soil stabilization to reduce sedimentation and erosion, a source of woody debris for streams which enhance instream habitat and provide a nutrient source for streams, and filtering pollutants. This criterion ensures that surface waters are protected with riparian zones and impacts are minimized.

Explanation: This criterion requires that 50 foot wide natural area buffers be maintained or established along all intermittent stream channels, ponds, and lakes. For perennial streams, riparian buffers should be 100 feet wide on each side. If natural conditions are not present along surface waters, they should be established. This can be accomplished by planting native riparian tree and understory species or allowing vegetation to establish and grow naturally. If vegetation is planted, refer to I.T.3 for extra credit for riparian restoration. If the area is left to grow back naturally, it should be marked off to reduce impacts. If there is a record for a Federally endangered or threatened aquatic species within the 14 digit HUC in which the development will occur, riparian buffers are required to be 100 feet wide on each side of intermittent streams and 200 feet wide on each side of perennial streams. Riparian buffer widths are measured as linear (horizontal) distances from the top of the bank.

Often impacts to riparian zones are unavoidable; therefore, a minimal amount of impacts are allowed. Impacts include, but are not limited to, road crossings, vegetation clearing, individual lots within the riparian buffer, and development infrastructure. If a new road will be located within the riparian zone, the road and all land beyond the road (away from the surface water) will be considered an impact. Therefore if new roads must be located within the riparian zone, there is an incentive to locate them as far as possible from the surface waters. If no intermittent or perennial streams, ponds, or lakes are identified on the property, this criterion is not applicable. If the acreage of impacts to riparian zones is 15.0 % or less, the applicant can continue with the certification process.

If the required riparian buffers include pre-existing infrastructure impacts (e.g., roads, sewer, gas, or water lines and associated managed easements, greenway trails) or extend beyond the applicant’s property boundary, that area will not be included in the acreage required for the buffer. Note that these pre-existing impacts will be examined during the Initial Consultation. If the impacts to these areas can be reduced such

as reducing the width of the mowed utility corridor, the applicant will need to reduce these impacts or they will be considered riparian impacts.

Impervious impacts within the riparian zone are assigned a weighting factor of 1.5. Each riparian zone is divided into an inner and outer half. For pervious impacts, such as utility corridors maintained by mowing or land in individual lots within the riparian zone, the weighting factor is 1.5 for impacts within the inner half of the riparian zone and 0.5 for impacts within the outer half of the riparian zone. When there is a pervious impact within the riparian zone, such as a mowed utility corridor, natural areas located beyond the pervious impact are not considered impacts. When there is an impervious impact within the riparian zone, such as a road located parallel to a stream, all pervious land beyond the impervious impact will be considered an impact. The exact weighting factor will depend on whether this pervious impact is within the inner or outer half of the riparian zone.

There is no minimal riparian buffer acreage threshold for this criterion. If there is a small amount of riparian buffer within the tract (~ 1 acre) and a road is required to go through this area, this requirement will be waived for one road crossing. Additionally, the cleared area for the road crossing must be no wider than 80 feet. If the area cleared for the road crossing is greater than 80 feet wide at any point where the road impacts the riparian zone, the development will not be eligible for certification.

Formula: This formula looks at the acreage of all riparian zones (50, 100, or 200 feet wide) and the acreage of riparian zone impacts. Impacts are weighted based on whether they are impervious or pervious and in the case of pervious impacts, whether they are within the inner or outer half of the riparian zone. If the percentage of weighted impacts is 15.0 % or less, the applicant can continue the certification process. Note that because impacts are weighted, the percentage of natural areas and the weighted percentage of impacts do not always add up to 100 %.

2. Jurisdictional Wetlands

1. Are jurisdictional wetlands conserved as natural areas (not included in individual lots)?

Purpose: Wetlands provide important ecological functions. Wetlands will continue to perform their important functions and provide wildlife habitat when they are conserved as natural areas rather than being included in individual lots.

Explanation: This criterion requires 95 % or more of the jurisdictional wetlands within a development tract to be conserved as natural areas. This criterion deals only with jurisdictional wetlands, which are often large and as such it may be impossible to avoid impact during development. Non-jurisdictional wetlands are often small wetland communities and are a Priority Habitat dealt with in the Pre-Design Checklist, but are not included in this requirement. Note that wetlands permitted to be filled will not be included in this criterion.

Formula: This formula calculates the percentage of jurisdictional wetlands that are conserved as natural areas. At least 95 % of the jurisdictional wetlands must be conserved to meet this requirement.

2. What percentage of 50 foot buffers surrounding jurisdictional wetlands are conserved as natural areas and free of impacts?

Purpose: Wetlands function best when they are protected by natural area buffers. Buffers around wetlands will improve water quality as well as protect wetland habitat. This criterion encourages applicants to set aside buffers around jurisdictional wetlands as natural areas.

Explanation: This criterion assesses the amount of impact within 50 feet of the edge of all jurisdictional wetlands. Jurisdictional wetlands that are permitted to be filled and therefore are no longer wetlands will not be included in this criterion. Types of impacts, conditions related to roads within wetland buffers, and pre-existing conditions discussed above in the riparian zones requirement apply here also. It is recognized that some buffer impacts may be unavoidable. However, the development should be designed specifically to minimize impacts to jurisdictional wetland buffers such as inclusion in individual lots, vegetation clearing, and infrastructure development. If there are no jurisdictional wetlands on the property, this criterion is not applicable. Also, if the buffer area for jurisdictional wetlands includes pre-existing roads or extends beyond the applicant's property boundary, that area will not be included in the acreage considered for the buffer.

Formula: This formula calculates the percentage of impacts within jurisdictional wetland buffers, which extend 50' from the outer edge of jurisdictional wetlands. Impacts cannot exceed 10%; if impacts exceed 10%, this requirement will not be met and the development cannot be certified.

3. Terrestrial Habitats

If Priority Habitat occurs on site, what percentage is conserved as a natural area?

Purpose: This criterion ensures that the wildlife habitats in priority need for conservation are set aside as natural areas. Priority Habitats are identified in the North Carolina Wildlife Action Plan. These habitats were identified as critical for conservation due to the rarity, diversity, threats to or value of the habitat to conservation of priority wildlife including Federal or State listed species.

Explanation: Fourteen Priority Habitats have been identified for the state; these are listed in the Pre-Design checklist section of the handbook and defined in Appendix B. A sufficient percentage of Priority Habitat must be set aside for the certification process to continue. Priority Habitat should be identified and surveyed during the Terrestrial Habitat Survey required in the Pre-Design Checklist but it is possible that areas may be found during the Initial Consultation (IC). Regardless of when a Priority Habitat is identified, applicants are expected to avoid impacts to these areas and conserve them as natural areas according to recommendations developed during the IC. If no Priority Habitats are identified on the property, this criterion is not applicable. There is a separate worksheet for Priority Habitats. The applicant will complete the Priority Habitats worksheet and information on this worksheet will be automatically transferred to the Requirements worksheet.

The Review Team can require up to 40 % of the Priority Habitats on the tract to be conserved as natural areas. However, if required Priority Habitats (riparian buffers, jurisdictional wetlands, and jurisdictional wetland buffers) comprise more than 40 % of the tract, sufficient land must be conserved to satisfy the requirements of the criteria that evaluate the protection of these important habitats. For instance, if required Priority Habitats comprise 60 % of the tract, over 40 % of the tract would be required to be conserved as a natural area but the Review Team could not require any other Priority Habitat be conserved. Note that the applicant may have to comply with permit or regulatory conditions that would result in the protection of additional land. An example would be protecting land around an active bald eagle nest, which is required under the Bald and Golden Eagle Protection Act.

If the tract contains less than 40 % Priority Habitats, all Priority Habitats will be Priority 1. If the tract contains more than 40 % Priority Habitats, the Review Team will ensure that the best 40 % of the Priority Habitats is conserved by identifying habitats as Priority 1 or 2. Priority 1 Habitat is required to be conserved. Priority 2 indicates that there is Priority Habitat that can be conserved but it is not required to be conserved. If it is conserved, the applicant will be rewarded in the Section I Scoring Criteria. The same type or area of Priority Habitat can have two priority levels. For example, if there are 3 separate areas of

rock outcrops, the Review Team can identify two as Priority 1 and one as Priority 2. Additionally, if more than 40 % of the tract consists of one type of Priority Habitat, such as a mature hardwood forest, the Review Team can identify areas of a contiguous Priority Habitat that are Priority 1 and areas that are Priority 2. This ensures that the highest quality portions of Priority Habitat are conserved and lower quality Priority Habitat areas are available for development.

Realizing that minor impacts to Priority Habitats may be unavoidable, impacts are allowed to Priority 1 Habitats up to 5 %. If Priority 1 habitats are impacted more than 5 %, the development cannot be certified.

Formula: There are no fields to populate for Terrestrial Habitats in the Requirements worksheet. The values for this criterion are automatically transferred from the Priority Habitats worksheet; the Requirements worksheet serves to summarize only. More details about populating the Priority Habitats worksheet is found in the next section.

4. Natural Areas

1. How many acres identified during the Initial Consultation will be set aside as natural areas?

Purpose: This criterion ensures that all certified Wildlife Friendly Developments have protected natural areas. If no natural areas exist on the property, natural areas will need to be created. Not only will such natural areas benefit wildlife, these areas will help the public realize that the development has made a strong effort to protect wildlife habitat. This criterion also ensures that the most appropriate places will be identified as natural areas.

Explanation: This criterion requires 3 acres or 10 % of the development tract to be conserved as natural areas. If there are sufficient natural areas on the tract to meet the requirement, this land must be conserved rather than restoring land that is currently not a natural area. In cases where this minimal amount of natural area does not exist, sufficient natural areas must be created or restored. For example, if the development occurs in a previous industrial area or in an agricultural area without any forested areas, a portion of the tract will need to be restored. Restoration efforts should create an area of native vegetation appropriate for local conditions.

To qualify as a natural area, land must 1) be in a common area, not in individual lots and 2) be in some stage of natural succession. Areas set aside for other criteria, such as riparian zones, wetlands, and wildlife corridors are considered natural areas. Land that will be restored, such as converted wetlands, can count as natural areas. During the Initial Consultation, the Review Team will identify areas that will qualify as natural areas. This step insures that the most appropriate areas are identified as potential natural areas and that the natural areas are of a sufficient size and sufficiently connected to other natural areas to benefit wildlife. Open space does not qualify as a natural area.

Note that in some cases the acreage of Priority Habitat will exceed 10 % and this requirement will be met by default when other required criteria are met. Also note that there are no fields to be populated for natural areas on this worksheet. The minimum amount is calculated based on the acreage of Priority Habitats and the acreage actually conserved is automatically calculated based on numbers supplied by the applicant in Scoring Criteria I.

Formula: This formula establishes a minimum threshold of 3 acres of natural areas. If the development is larger than 30 acres, 10 % of the development tract will need to be conserved as a natural area. These minimum requirements must be met for the development to be considered for certification.

2. Are all natural areas protected by permanent conservation easements or deed restrictions owned by the homeowners association?

Purpose: This criterion ensures that all certified Wildlife Friendly Developments properly protect natural areas.

Explanation: Natural areas cannot be in individual lots, they must be in common space. This common space must be protected by a conservation easement or be owned by the homeowners association and have deed restrictions. Conservation easements are owned by a third party such as a land trust or government entity. For a homeowners association to hold a conservation easement, they must establish an independent 501c3 non-profit organization with a mission for education and conservation. For this to occur, the development would need to benefit the public, not just residents of the development.

This criterion ensures that the developer has taken the proper steps to protect natural areas on site. The applicant must provide a map of all natural areas to be maintained under deed restrictions or homeowners association agreements. While this is a yes/no criterion, any relevant information related to the protection of natural areas should be provided.

PRIORITY HABITATS

The Priority Habitats worksheet is a separate worksheet used to compile information about Priority Habitats for the Requirements worksheet. Applicants will need to populate four cells on this worksheet; this information will automatically populate the Requirements worksheet to determine if the requirement is met. Because riparian buffers, jurisdictional wetlands, and jurisdictional wetland buffers are required Priority Habitats, information on these requirements is automatically included to determine how much additional Priority Habitat must be conserved.

Some wetlands and wetland buffers will probably occur within riparian zones. Therefore the applicant will need to determine how much land that is included in the riparian buffer, jurisdictional wetland, or jurisdictional wetland buffer overlaps with another category. This acreage of overlap goes in cell D-17. Next the applicant will need to determine if some of the impacts to the individual categories affect more than one category. This acreage of impact overlap goes in cell G-17. These values will be used to determine how much additional land can be identified as Priority 1 habitat.

The Review Team will identify Priority 1 and 2 habitats (if applicable) and indicate locations on a map. The acreage of identified Priority 1 habitat (cell D-23) cannot exceed the acreage shown in cell G-20. Cell G-21 indicates the acreage of Priority 1 habitat that must be conserved to meet the requirement; this is 95 % of the land identified by the Review Team as shown in cell D-23.

The applicant will determine the acreage of impacts to Priority 1 habitat in cell G-23. Note that impacts to the required Priority Habitats (riparian buffers, jurisdictional wetlands, and wetland buffers) are not considered here. The applicant must conserve 95 % of the Priority 1 habitats identified by the Review Team; the acreage of required Priority Habitats is not included in this calculation. If enough Priority Habitat is conserved, the requirement will be met and cell C-27 will read "YES".

There is no requirement to conserve Priority 2 habitat; information about Priority 2 habitat identified by the Review Team and protected by the applicant will be used to populate cells in Scoring Criteria I. The applicant only determines the acreage of impact to Priority 2 habitat and enters this value in cell G-24.

SCORING CRITERIA – SECTION I

Development Conservation Design

The Scoring Criteria are comprised of two sections that reflect the chronology of development: Section I – Development Conservation Design and Section II – Development Construction and Post-Construction. Not all criteria will apply to all developments. Section I criteria address the developer's plans for the tract and planned measures that will benefit wildlife and habitats. Section I is initially evaluated as a plan; however, it is important to understand that Section I criteria remain open throughout the certification process and must be completed as planned in order to receive the same amount of points. For example, if the applicant plans to set aside 100 acres as natural areas, he will be scored initially based on 100 acres in Section I. However, if 20 of those acres are taken up by individual lots during the construction phase, the applicant will only receive credit for 80 acres and the score will be recalculated.

A. Development Location

1. Where is the development located?

Purpose: This criterion rewards developments that occurs adjacent to other developments, such as within town or city limits. It gives partial credit for developments outside of city limits but within the city's Extraterritorial Jurisdiction (ETJ) and discourages sprawl in rural or undeveloped areas.

Explanation: If the majority of the development tract occurs within city or town limits, 4 points will be given. If the majority of the development tract occurs outside city or town limits, but within the city or town ETJ, 2 points will be given. If the majority of the development tract occurs outside the ETJ, no points will be awarded.

2. Is municipal sewer available or will it be extended to the development?

Purpose: This criterion rewards developments that have municipal sewer lines instead of septic tanks. Septic tanks are more likely to fail and impair local water quality. Sewer lines help protect water quality and also give developers more options for clustering development.

Explanation: While we do not encourage extending sewer lines into rural areas far from urban centers, the overall benefits of sewer lines outweigh the sprawl they may promote.

B. Building Area Constraints

1. How many total acres of land within the development footprint contain the following conditions?

Purpose: This criterion encourages developers to avoid lots or development infrastructure in these environmentally sensitive areas where impacts may also increase the likelihood of damage to personal property.

Explanation: Conditions considered for this criterion are: steep slopes (30 %), within 0.5 miles of Class SA waters, within 575 feet of ORW designated waters, acid-bearing rock formations, FEMA maps showing flood-prone areas including 100-year floodplains, ocean overwash hazard areas, inlet hazard areas, safety zones within 450 feet of NCWRC Game Lands, or within 100 feet of any conservation land. If such conditions are found within the development tract, these areas can be conserved as natural areas, outside of individual lots. Additionally, roads and utility corridors should avoid impacting these areas. The development footprint consists of everything that is not conserved as natural areas or open space. This includes individual lots, roads, utility corridors, and any community structures.

Steep slopes are defined as areas with average slopes of 30 % or greater. A 30 % slope would, on average, rise 3 feet vertically for every 10 linear (horizontal) feet. For the purposes of WFDC, any area that rises more than 15 feet over a 50 feet horizontal distance is considered to have a slope greater than 30 %. Acid-bearing rock formations can release acidic compounds and change surface water pH if disturbed. Flood-prone areas include land with the 100 year floodplain as well as coastal areas that are subject to flooding during storm events as delineated by most recent FEMA maps (updated every 5 years). Ocean overwash hazard areas are subject to flooding during storm events while inlet hazard areas are located close to existing inlets or are potential locations for new inlets over time as barrier islands migrate. A 450 foot safety zone is recommended around NCWRC Game Lands to minimize conflicts between Game Lands users (especially hunting) and adjacent residents. The 100' buffer around conservation lands provides a buffer for government owned lands as well as lands held by private entities or in a conservation easement. Conservation lands are often actively managed to maintain ecosystem integrity, and this buffer will minimize conflicts over active management activities (such as prescribed burning) and adjacent residents. Lot lines should be drawn to avoid these areas.

Formula: Points for this criterion are determined using a formula based on the acreage of the development footprint and the acreage of the development footprint containing the conditions listed for this criterion. This formula yields points ranging from 2 to - 38. See Figure 1 in Appendix A.

2. How much land in the development footprint has these land uses?

Purpose: This criterion assesses the current condition of land to be developed and encourages development in areas that have already been altered and discourages development in areas that are environmentally sensitive or provide value as forest lands or farmland.

Explanation: This criterion groups land use into 9 categories: Previous industrial or commercial site (10 points), Previous residential development (8 points), Farmland not otherwise designated (6 points), Monoculture forest (4 points), Farmland of state importance (3 points), Prime or unique farmland (2 points), Mature, mixed native forest (not otherwise designated) (- 1 points), Local or Regional Significant Natural Heritage Area (SNHA) (- 5 points), and State or National SNHA (- 6 points).

The final score for this criterion is based on the percentage of the various land use conditions that will be developed. Lands that will be set aside as natural areas are not included in this criterion. This criterion only assesses land use for the development footprint, which includes individual lots, roads, utility corridors, etc. A development will score the most points if the land to be developed was previously used

as a commercial or industrial site. Lands well-suited for development, such as previous residential development or marginal farmland will also yield positive points. Note also that not all land uses are included here. For instance, a mixed species forest that is not mature is not included here. By default, any land use not included here has a value of zero.

Formula: Points are awarded based on existing land use and the design of the proposed development. The acreage of each land use is multiplied by a factor from 10 to - 6. The sum of each acreage and multiplier is divided by the acreage of the development footprint. This is calculated as the acreage of natural areas and open space subtracted from the acreage of the development tract.

C. Development Design

1. If changes to the development diagram were suggested during the Initial Consultation, were these changes made?

Purpose: This criterion allows the Review Team to make suggestions during the Initial Consultation. These suggestions may relate to development clustering, road placement, or other concerns that affect how wildlife habitat is affected by the design of the development.

Explanation: This criterion is tied to the Initial Consultation (IC). If changes to the development design are suggested during the IC, the applicant will have an opportunity to earn points by adjusting the design of the development. Such suggested design changes may reduce the footprint of the developed area and contribute to the overall amount of natural area and open space set aside within the development. Suggested changes may include road layout and shoreline stabilization in Coastal Counties. Suggestions made during the IC will be documented and this criterion will be scored based on how many of these suggestions are implemented.

Formula: To earn points for this criterion, changes suggested during the IC must be included in a revised development design. The maximum number of points is equal to the number of suggestions. If the Review Team suggests 3 changes, a maximum of 3 points can be earned. If 7 changes are suggested, up to 7 points can be awarded.

2. If codes do not allow for certain elements of a wildlife friendly design, has a text amendment been requested?

Purpose: This criterion encourages developers to work with local governments to implement clustered developments and other elements of wildlife friendly designs and to ask for text amendments in cases where codes do not allow conservation designs. Such interaction between developers and local governments may influence changes in local ordinances to allow wildlife friendly elements in the future.

Explanation: To earn points, the applicant must provide proof that 1) the development does not conform to existing ordinances, and 2) a text amendment request to allow wildlife friendly elements has been submitted to the local planning entity for review. Points will be awarded regardless of the outcome of the text amendment request. Note that the applicant must determine if this criterion is applicable. If codes or ordinances do not allow for certain design elements, the applicant should type "1" in the Applicable column (column I). If codes and ordinances allow for all design elements, this criterion is not applicable and a "0" should remain in column I.

Formula: If the applicant requests a text amendment for one or more wildlife friendly design elements, 3 points will be awarded.

D. Natural Areas & Open Space

1. How many acres will be set aside as natural areas?

Purpose: This criterion encourages developers to conserve quality habitats as natural areas. Riparian areas, wetlands, wildlife corridors, and other habitats are important for wildlife and function best when they are located in common areas, outside of individual lots.

Explanation: Refer to the Requirements section for more information on what qualifies as a natural area. This criterion is similar to the requirement for natural areas; this scoring criterion provides incentive for conserving more than the 10 % minimum requirement.

Formula: To earn any points for this criterion, at least 30 % of the development tract must be set aside as natural areas. Although the maximum value is set at 6 points for calculation purposes, a development can earn more than 6 points based on the formula. If more than 50 % of the development tract is set aside as natural areas, more than 6 points will be awarded. See Figure 2 in Appendix A.

2. How many acres will be set aside as open space?

Purpose: This criterion rewards developments that set aside open space with minimal amounts of imperviousness. Open space can include recreation areas, some development amenities, and stormwater management areas.

Explanation: To qualify as open space under this criterion, the land must 1) be in a common area, not in individual lots and 2) require only minimal maintenance but generally does not require compaction, weekly mowing or excessive amounts of fertilizer or herbicides. Specifically, golf courses, wastewater spray fields and athletic fields (such as baseball or soccer fields) would not qualify due to the compaction and maintenance associated with these uses. Note that open space is not considered a natural area. An area with 10 % or more imperviousness cannot be considered open space. Stormwater management practices, specifically stormwater retention ponds, stormwater wetlands, and bioretention areas, can count as open space.

Formula: Points are awarded based on the percentage of the tract set aside as open space. A maximum of 2 points are awarded if 5 % of the development qualifies as open space. See Figure 3 in Appendix A.

E. Habitat Connectivity and Wildlife Corridors

1. Were wildlife corridors identified during the Initial Consultation incorporated into the development design?

Purpose: Wildlife need to safely move among various habitats as they seek food, shelter, and water, or move among breeding, rearing, and overwintering areas. This criterion encourages developers to connect natural areas with wildlife corridors so that wildlife can travel in natural habitat while moving among natural areas.

Explanation: This criterion is tied to the Initial Consultation (IC) because wildlife corridors are site specific. If one or more wildlife corridors are suggested during the IC, the development will need to plan for those wildlife corridors to receive credit. If wildlife corridors are not needed, none will be suggested during the IC and this criterion will not be applicable. To qualify as a wildlife corridor, land must 1) qualify as a natural area, 2) connect natural areas, and 3) be at least 200 feet wide throughout the length of the corridor.

During the IC, the Review Team will discuss wildlife corridors with the applicant and assign priority levels for wildlife corridors. The Review Team will indicate the location of the corridor on a map of the tract.

These priority levels range from 1 to 3 with 1 being highest priority. While riparian corridors do act as wildlife corridors, these are not considered wildlife corridors for the purpose of this criterion.

Formula: Points for this criterion are given based on the percentage of the suggested wildlife corridors that are planned for implementation. For calculation purposes, a priority 1 corridor is given a weighting factor of 3, a priority 2 corridor is given weighting factor of 2, and a priority 3 is given a weighting factor of 1. The maximum number of points for this criterion is 5; maximum points will be awarded when the applicant implements 100 % of the suggested corridors, regardless of the number of suggested corridors or the priority level of the corridors. When corridors with different priority levels are suggested, more points will be awarded if the applicant implements the higher priority corridor. For example, if one priority 1 corridor and one priority 2 corridor are suggested, the applicant will receive 5 points for implementing both corridors, 3 points for implementing only the priority 1 corridor, and 2 points for implementing only the priority 2 corridor.

2. What are the average and minimum widths of the wildlife corridor(s)?

Purpose: Wildlife corridors need to be at least 200 feet wide to fully function as corridors for most wildlife species. Wider corridors will benefit even more species, particularly forest interior species. This criterion awards points based on the minimum and average widths of the wildlife corridors and encourages wide wildlife corridors.

Explanation: To qualify as a wildlife corridor, the land conserved must be at least 200 feet wide throughout the corridor. If the prospective corridor has an average width of 250 feet but individual lots reduce the width to 175 feet in places, it will not qualify as a wildlife corridor. While 200 feet is wide enough to function as a wildlife corridor, 300 feet will provide more benefit to more wildlife species. As a result, 4 points are given if the average corridor width and minimum width are 300 feet. Extra credit is built into this formula to provide an incentive for wider wildlife corridors. Points will continue to increase up to 8 points, which corresponds to minimum and average widths of 520 feet. Note that the maximum points can also be reached with an average width greater than 520 feet and a minimum width less than 520 feet. Note that impacts to corridors such as road crossings are addressed in I.E.3. Road and utility line crossings are considered impacts but do not affect the minimum width of the corridor as long as they are generally oriented perpendicular to the corridor. If no wildlife corridors are suggested, this criterion is automatically not applicable.

Formula: Points for this criterion increase linearly starting at 2 points for corridors with average and minimum widths of 200 feet. If the minimum width is less than 200 feet, it does not qualify as a wildlife corridor. The overall score is a weighted average of the formulas for the average and minimum widths. As the average or minimum corridor width increases, points will increase linearly up to 300 feet. A non-linear, asymptotic formula is used when corridor widths (average or minimum) are greater than 300 feet. For calculation purposes, the maximum points for this criterion are 4. However, points for this criterion can reach as high as 8. See Figure 4 in Appendix A.

3. Are wildlife corridors bisected by roads, power line corridors, or other development infrastructure?

Purpose: Wildlife corridors are most effective when impacts are minimized. This criterion encourages applicants to route utilities, roads and other infrastructure around wildlife corridors.

Explanation: Applicants earn points by minimizing impacts to designated wildlife corridors. Roads and utility corridors are the primary impacts that bisect wildlife corridors. Wildlife corridors must be natural areas, therefore individual lots are not allowed. This criterion is limited to impacts that bisect the corridor; impacts that only cause a narrowing of the corridor are addressed in I.E.2. If no wildlife corridors are included in the development design, this criterion is automatically not applicable.

Formula: This formula compares the acreage of the wildlife corridor with the acreage of the impacts. The area of road impacts is weighted twice the area of utility corridor impacts. Up to 5 points for this criterion are awarded for 15 % or less impacts to designated wildlife corridors. If impacts exceed 15 %, no points will be awarded. See Figure 5 in Appendix A.

4. Will wildlife passages recommended during the Initial Consultation be implemented?

Purpose: This criterion allows for wildlife passage structures to be included in the development design. Wildlife passage structures can be important considerations to better enable wildlife to move among habitats that are separated by development impacts, primarily roads.

Explanation: This criterion is tied to the Initial Consultation (IC). Wildlife passages facilitate the movement of animals underneath or over roads or other infrastructure where they might become trapped or killed. Typically, wildlife passage will be discussed when a wildlife corridor is bisected by a road. Additionally, wildlife passage may be suggested where two wetland communities are separated by a road. If wildlife passages are recommended during the IC, the development will need to plan for them to receive credit. If no wildlife passages are recommended at the IC, this criterion is automatically not applicable. Wildlife passages may include fencing that directs animals to passageways beneath a road. This is most appropriate where fill material results in a road raised above the surrounding landscape. The exact design of the passageway will be discussed during the IC. Signage should be included to identify the passage for residents.

Formula: Points for this criterion are given based on the number of wildlife passages suggested during the IC that are planned for implementation. The maximum number of points for this criterion varies; it is equal to twice the number of suggested passages. Two points are awarded for each passage implemented.

F. Terrestrial Habitats

1. Are additional Priority Habitats conserved?

Purpose: This criterion further ensures the conservation of the rarest and most valuable wildlife habitats by encouraging the applicant to set aside additional Priority Habitats as natural areas.

Explanation: Priority Habitats are listed in the Pre-Design checklist section of the handbook and defined in Appendix B. On the Priority Habitats worksheet, Priority Habitats are identified as Priority 1 or 2. This criterion only addresses Priority 2 Habitat; conserving Priority 1 Habitat is a requirement. Applicants are awarded points based on the percentage of Priority 2 Habitat that is conserved as natural areas. Note that the points for this criterion are determined on the Priority Habitats worksheet, not the Scoring Criteria I worksheet.

Formula: Points are awarded using a linear equation based on the percentage of Priority 2 habitat that is conserved. Applicants can receive up to 5 points if 100 % of the Priority Habitat on the tract is protected. See Figure 6 in Appendix A.

2. Have areas of noxious invasive vegetation identified during the Initial Consultation been removed or controlled?

Purpose: Noxious invasive vegetation degrades wildlife habitat. This criterion rewards the applicant for removing or controlling areas of invasive vegetation discussed during the IC.

Explanation: During the IC, the Review Team will identify any areas on the property that contain invasive vegetation that needs to be controlled. Examples include kudzu, privet, and Japanese honeysuckle. The Review Team will recommend practices to control the invasive vegetation. If efforts to

control the invasive vegetation are successful, the applicant will earn points. If invasive vegetation is removed from all areas discussed during the IC, 3 points are awarded, if it is only controlled at some areas, 1.5 points will be awarded. If no effort is made to control invasive vegetation or there are no signs of successful control, no points will be awarded.

G. Habitat Protection and Management

1. Have management plans that include the list of items in the handbook been created for all Priority Habitats?

Purpose: Without active management, most wildlife habitats and natural areas adjacent to development will become degraded over time. This criterion rewards developers that write management plans for Priority Habitats on site that will be protected or restored.

Explanation: To receive credit, management plans must be created for all Priority Habitats on site. The management plan should outline how Priority Habitats will be protected and managed using strategies designed to sustain, restore, or enhance the habitat over time. To receive credit, management plans must include the items listed below:

- **Habitat Descriptions:** The terrestrial habitat report generated as part of the Pre-Design Checklist can be used to compile this section of the management plan. The habitat description section must include a description of Priority Habitats on site and identification of any priority species on site.
- **Habitat Maps:** Maps generated as part of the Pre-Design Checklist can be used for this section. Maps should delineate the location and boundaries of any Priority Habitats on site.
- **Site Use and Infrastructure:** This section should describe any public use, access points, site infrastructure, and trails that will be constructed within Priority Habitats.
- **Site Management Plan:** The purpose of this section is to describe management activities that will be undertaken to maintain, restore, or enhance Priority Habitats. This section should include:
 - Identification of present and future threats to habitat integrity
 - Description of management or restoration needs for each Priority Habitat type on site
 - Identification of management goals and prescriptions for each Priority Habitat type
 - Description of plans for controlling exotic, invasive plants
 - Plans for tree removal in Priority Habitats (due to safety hazards)
 - Monitoring and evaluation plans (Describe how management will be monitored and evaluated over time, and how changes to management plans will be made).
- **Timeline and Cost:** This section should provide a timeline and cost estimates for management plan implementation.
- **Management Responsibility:** This section should identify who will be responsible for management and restoration activities. In addition, this section should identify who will be responsible for long-term monitoring.
- **Contracts/Agreements:** The management plan should include any contracts or agreements outlining responsibility of management and restoration activities.

Formula: If a management plan is submitted with all above components included, 5 points will be awarded. If no management plan is submitted, or if the plan is incomplete, 0 points will be given.

2. Is a funding mechanism in place to ensure management plan implementation?

Purpose: Management plans will not achieve their desired outcomes unless they are implemented. Funding for natural resource management and monitoring is often the greatest obstacle to management plan implementation. The purpose of this criterion is to reward developers who have a mechanism in place to fund implementation of the management plan.

Explanation: To receive credit, applicants must show evidence that a funding mechanism has been established at the time of application. Funding mechanisms could include HOA fees, fees collected as part of lot sales, or grant funding.

Formula: If acceptable proof of a funding mechanism is submitted, then 5 points will be awarded. If not, 0 points will be given.

3. Is prescribed fire included in management plans for fire-adapted habitats? (EXTRA CREDIT)

Purpose: Fire adapted habitats are those that depend on periodic fire for ecosystem health. In fire adapted ecosystems, prescribed fire promotes the growth and regeneration of a diverse vegetative ground cover that provides food and shelter for many wildlife species. This criterion rewards developers that include prescribed fire in management plans for fire-adapted ecosystems.

Explanation: Fire-adapted ecosystems in North Carolina include longleaf pine forests, grasslands, pocosins, Carolina bays, and some upland hardwood forests. Experts should be consulted to determine if a particular habitat would benefit from burning, and to address any potential risks fire may pose. To receive credit, a management plan must be written that includes the elements outlined in I.G.1. The management plan should include prescriptions, cost estimates, and a timeline for implementing prescribed burning activities on natural areas within the development tract.

Formula: If plans to carry out prescribed fire are deemed adequate by the Review Team, 3 points will be awarded. If prescribed fire will not be undertaken in fire-adapted ecosystems, if plans to conduct prescribed fire are deemed inadequate, or if prescribed fire is not appropriate, no extra credit points will be awarded.

H. Riparian Zones

1. Are impacts to riparian zones planned?

Purpose: Protection of riparian zones is a requirement for certification. This criterion encourages applicants to avoid impacts to riparian zones as much as possible.

Explanation: Points for this criterion are automatically calculated on the Requirements worksheet. Some riparian impacts are unavoidable, such as road crossings. However, developments should be designed to minimize impacts to riparian zones. This scoring criterion goes beyond the requirement and awards points for minimizing riparian impacts and takes points away as the percentage of riparian impacts approaches the 15 % threshold.

Formula: Point values range from 5 to - 6 and are based on the total acreage of riparian zone versus the total acreage of impact. Impacts are weighted the same as for the riparian zone requirement. See Figure 7 in Appendix A.

2. Are forested riparian buffers planned for perennial & intermittent streams beyond requirements? (EXTRA CREDIT)

Purpose: Protection of riparian zones is a requirement for certification. This criterion encourages applicants to protect wider areas of land along surface waters.

Explanation: This criterion gives extra credit when applicants have wider protected riparian zones than required. To qualify as a wider buffer, natural areas beyond the riparian buffer boundary must be contiguous with the required riparian buffer. Only land within 600 feet of the streambank or waters edge will be eligible for this criterion. Also, land beyond a ridgeline cannot be considered part of the riparian zone.

Formula: Points are awarded based on the amount of land beyond the riparian zone requirement that is conserved as a natural area. This is expressed as a percentage of the required riparian zone acreage with a maximum of 4 points. The maximum points are reached when the acreage of additional riparian zone land and required land are equal. Note that the acreage of impacts is also used to determine the number of points awarded. For example, if there are 10 acres of required riparian zones but 1 acre was impacted, the applicant will be credited for only 4 acres of additional riparian zones if he conserves 5 acres beyond the required riparian boundary. Because there was 1 acre of impacts, this amount will be subtracted from the total acreage of additional riparian areas. See Figure 8 in Appendix A.

3. Are forested riparian buffers planned for ephemeral stream channels?

Purpose: Ephemeral channels form the headwaters of streams. Protecting riparian zones along ephemeral channels is important for ephemeral streams, intermittent and perennial streams downstream, as well as the biota inhabiting the riparian zones of ephemeral channels.

Explanation: This criterion rewards applicants that set aside riparian zones along ephemeral channels as natural areas. There are no minimum requirements for the width of the natural area along the ephemeral channel; a riparian buffer of 20 feet can be included. To qualify as riparian buffers, natural areas must be contiguous with the channel. Riparian buffers for ephemeral channel extend 50 feet from each side of the channel.

Formula: Points are awarded based on the acreage of land within 50 feet of the ephemeral channels that is set aside as a natural area. The maximum points for this criterion is 4; at least 50 % of the land within 50 feet of the ephemeral channels on the tract must be set aside to receive any points. Protecting 50 % of the land within 50 feet of the ephemeral channels yields 1 point. See Figure 9 in Appendix A.

I. Wetlands

1. Will the development impact jurisdictional wetlands?

Purpose: Jurisdictional wetlands are very important and impacts to these valuable resources can require a Federal permit. The purpose of this criterion is to encourage applicants to minimize impacts to jurisdictional wetlands.

Explanation: This criterion rewards applicants who minimize impacts to jurisdictional wetlands and penalizes applicants with a high percentage of impacts. Note that this criterion only applies to development tracts with greater than 0.50 acres of wetlands. Also note that dredging and filling of wetlands are not the only impacts considered here. Removing trees on forested wetland sites, mowing, burning, spraying, cutting, removing vegetation, and other activities that degrade the quality and function of wetlands are considered impacts. If such impacts are considered beneficial and included in management plans approved by the Review Team, they will no longer be considered impacts. This will be evaluated on

a case by case basis. If a wetland is also considered a Priority Habitat, additional criteria will apply. This criterion does not evaluate whether or not wetlands are in natural areas, this is done in the Requirements section.

Note that small wetland communities, which are often ephemeral wetlands, are also a Priority Habitat. These small wetland communities may or may not qualify as jurisdictional wetlands. Points for conserving small wetland communities are also awarded under the Terrestrial Habitats section (See requirements and section I.F.).

Formula: Applicants will receive a maximum of 3.6 points for this criterion if there no impacts to jurisdictional wetlands. Points will decline in a linear manner as the percentage of impacts increases. If the percent of impacts is ~ 6.3 %, the applicant will receive 0 points. As the percentage of impacts increases beyond ~ 6.3 %, the point value will continue to decline. See Figure 10 in Appendix A.

J. Hydrology

1. Are stream hydrology modifications planned?

Purpose: Providing natural stream flows supports all life stages of aquatic species and maximizes the amount of habitat available throughout the year. This criterion penalizes modifications to stream hydrology.

Explanation: Alterations to the natural flow of streams can significantly affect the habitat available to aquatic organisms and can act as a barrier to migration, species colonization, and genetic flow among populations. Water withdrawals or diversions can include, but are not limited to, water used for irrigation, off-line ponds or lakes, water fountains, artificial stream channels, or created artificial waterfalls. Natural stream flows are highly desirable. If no perennial or intermittent streams are identified on the property, this criterion is automatically not applicable. Note that impoundments are not addressed here; they are addressed in I.M.1. and I.M.2. Also, any modifications necessary for stream restoration will not be penalized.

Formula: Each water withdrawal or water diversion will receive - 5 points.

K. Aquatic Life Impediments & Barriers

1. Are any artificial barriers to aquatic life movement planned?

Purpose: Unobstructed stream habitat allows normal species movement, species colonization, seasonal spawning movement, and maintains genetic flow among populations. This criterion penalizes applicants for planning artificial barriers or installing culverts that are not designed or installed in a manner that will allow adequate movement of aquatic life.

Explanation: Artificial barriers in stream channels can have significant effects on stream habitats and functions. Barriers to natural stream flow and function can include, but are not limited to, constructed artificial waterfalls, improperly installed culverts (i.e., too long, too steep, or perched), or structures placed in a stream to divert water from the channel. Perched culverts are not placed low enough in the stream channel creating a waterfall at the downstream end which can be a barrier to aquatic organism movement at low flows. These barriers to movement can significantly affect the habitat available to aquatic organisms. Federal and State permits are also required to place any structure into a stream and are separate from this certification process. If no perennial or intermittent streams are identified on the property, this criterion is automatically not applicable.

Culvert design criteria: Culverts greater than 48 inches in diameter must be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less must be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort must be made to maintain the existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions.

Formula: Each artificial barrier and improperly designed culvert will receive - 3 points.

L. Stream Crossings

1. What percentage of streams are crossed with spanning structures (bridges or bottomless arch culverts)?

Purpose: This criterion encourages use of bridges rather than culverts or pipes. Providing unobstructed stream crossings and maintaining sufficient hydraulic capacity promotes stream bank stability and channel morphology. Spanning structures such as bridges and bottomless arch culverts also provide wildlife passage underneath roadways and pedestrian paths.

Explanation: Spanning structures that accommodate flood flows, avoid the need for stream channel modification, and allow wildlife and pedestrian passage have the least effect on stream habitats and functions. Using spanning structures minimizes wildlife habitat fragmentation. Providing safe passage for wildlife underneath roadways decreases wildlife/vehicle collisions, minimizes road kills and provides a safer driving experience for the public. Note that criteria I.K.1. and I.L.2. also pertain to stream crossings. If spanning structures are used instead of culverts, point values for these two criteria may also increase because spanning structures are not aquatic life passage barriers nor are they included in length of stream in pipes or culverts.

Spanning structures can be bridges or qualifying bottomless arch culverts. For bottomless arch culverts to qualify as spanning structures, they must extend 15 feet or one bankfull width from the top of bank on each side of the stream. In other words, footings for the bottomless arch culverts can be no closer to the stream on either side that 15 feet or one bankfull width measured from the top of the bank.

Formula: The maximum number of points varies; each stream crossing is worth 3 points. If there are 3 stream crossings and 2 are crossed with bridges, the applicant will receive 6 points out of a maximum of 9 points.

2. How many linear feet of streams pass through pipes or culverts?

Purpose: Streams put into pipes or culverts lose most habitat functions. Pipes and culverts can also change water velocities, alter water temperature and block aquatic organism passage. This criterion encourages applicants to minimize pipe and culvert length, minimize the number of stream crossings, and maximize the use of spanning structures (bridges or bottomless arch culverts).

Explanation: We anticipate that not all perennial and intermittent streams can be bridged. Development and infrastructure should be situated to minimize the number of stream crossings. Where crossings are unavoidable and spanning structures are not feasible, the crossings should be perpendicular (as close to 90° as possible) to the stream channel. No parallel encroachments should be planned and pipe and culvert lengths should be minimized by the use of headwalls or retaining walls if necessary. If there are no identified streams on the property or if the length of stream is less than 200 feet, this criterion is not applicable.

Formula: Point values range from - 5 to 3 and are based on the total length of identified stream channels on the property versus the length of stream channels placed in pipes or culverts. The formula

considers both the length of stream impacted and the percentage of stream impacted. If there is 200 feet of stream on the tract and the stream crossing impacts 45 feet of stream, the applicant will receive 0 points. For this stream length, a shorter length of buried stream will result in positive points while a longer length will result in negative points. See Figure 11 in Appendix A.

M. Impoundments

1. Are impoundments other than stormwater retention ponds planned?

Purpose: This criterion discourages the construction of amenity ponds.

Explanation: Ponds can be a source of introduced species to surrounding streams and often harbor nuisance wildlife. Natural waters can be a focal point and treated as amenities to the development. Ponds constructed in park-like settings attract Canada geese and often become nutrient rich causing algal blooms and fish kills. These ponds are often stocked with non-native fish for anglers, providing some recreational benefit, but are often not properly managed which diminishes their use. These ponds are also subject to unauthorized stocking of invasive or noxious fish and plant species that can find their way into adjacent surface waters. If a pond is planned, the Review Team will need to see maps and diagrams showing location, dimensions, water supply and outflow design.

Formula: Point values are based on simple presence or absence; 3 points are awarded for no ponds.

2. Will any in-line impoundments be constructed on perennial streams?

Purpose: This criterion discourages the construction of ponds or lakes in-line with perennial stream channels.

Explanation: Impoundments that are constructed in-line with perennial stream channels pose significant threats to aquatic populations. Ponds that are constructed in-line can present a physical barrier to normal species movement, spawning movements, and can be a barrier to genetic flow among populations. The temperature of water released from these impoundments is often warmer than the stream below the impoundment; this can have significant impacts to thermally sensitive species like trout. Flows below these impoundments can also vary substantially from natural stream flow due to the impoundment effect or because water is diverted for other uses. In addition, in-line ponds represent a significant threat for the introduction of exotic invasive species because these ponds are typically stocked by the landowners.

Formula: Each in-line impoundment will receive -10 points.

N. Stormwater Management & Low Impact Development (LID) Techniques

1. Will the development use stormwater management BMPs to reduce runoff?

Purpose: Developments replace pervious surfaces with impervious surfaces such as roads, rooftops, and driveways. Increases in impervious surfaces change the way that water runs off the land into streams and can degrade streams and harm their inhabitants. Stormwater Best Management Practices (BMPs) can reduce the impacts caused by the increase in impervious surfaces and help the hydrology of a development mimic pre-development conditions.

Explanation: This criterion encourages the applicant to incorporate various stormwater BMPs in the development. These BMPs are: bioretention areas (also known as rain gardens), rain barrels or cisterns, green roofs, stormwater wetlands, permeable pavement, stormwater retention ponds, level spreaders, and dry wells. Other BMPs will be considered if ample references are provided to explain their benefits. Common areas and buildings will be assessed for their use of these LID approaches. Individual homes

using these BMPs will not be considered in this criterion; but homeowners are encouraged to incorporate these BMPs. BMPs used in the development should be described and their locations shown on a map.

Formula: This criterion examines the number or surface area of each of these BMPs used within the development footprint. Because some BMPs are more costly and require more land than others (stormwater wetlands for example) a multiplier is used to determine the number of points appropriate for each BMP. The number of places where a BMP is used is tallied and then multiplied by the multiplier for each BMP. The final number of points is based on the total number of BMP points per acre. The maximum number of points for this criterion is 7. To earn 7 points, 0.07 BMP points per acre are needed.

2. What type of drainage system will the development use?

Purpose: This criterion encourages use of open drainage systems that do not concentrate stormwater runoff to single discharge points where scour can occur and there is little filtration of pollutants.

Explanation: Open systems that are designed to provide diffuse flow of runoff water allow filtration of particulates, some removal of nutrients, and ground infiltration before water reaches streams. Curb and gutter systems with subsurface collection systems with no stormwater BMP treatment should be avoided. Stormwater should never be discharged directly to surface waters. Concentrating stormwater runoff allows pollutants to easily enter streams, affecting water quality, and the concentrated flows can cause significant changes in stream hydrology (flashy flows). Stormwater collection systems should be designed to provide runoff rates that result in minimal changes to stream flows (the post-construction hydrograph should mimic the pre-development hydrograph). The use of grassed swales and stormwater BMP's is encouraged. Drainage systems are assigned different point values based on their ability to reduce stormwater impacts and mimic pre-development hydrological conditions.

Formula: Point values are based on the length of each type of stormwater collection system used versus the total length of the drainage network. Point values range from 7 if a diffuse drainage system is used throughout the development to 0 if curb and gutter with a subsurface drainage system is used exclusively.

O. Utility Placement

1. Are utilities placed beyond the 100 year floodplain or outside the protected riparian zone (whichever is greater)?

Purpose: Vegetation is cleared to install utilities such as water and sewer lines, electrical lines (above and below ground) and communication lines. Placing utilities beyond the 100 year floodplain or protected riparian area reduces impacts to these important areas along stream corridors. This criterion encourages the applicant to place utilities outside of the floodplain and riparian area.

Explanation: This criterion compares the linear footage of utility lines in the development tract with the length of lines that are within the protected riparian or floodplain areas. If the 100 year floodplain is wider at a given location than the protected riparian zone, the 100 floodplain will be used to evaluate this criterion. Note that the width of the riparian zone can vary from 50, 100, or 200 feet depending on stream size and the presence of Federally listed species. In addition to placing utility corridors beyond floodplains and riparian zones, utility impacts can be reduced by minimizing corridor width, grouping utilities within the same corridor, or placing utilities within road right of ways. If there is no land within a 100 year floodplain on the tract, this criterion is automatically not applicable. Note also that only the length of utilities that are generally oriented parallel with streams are considered in this criterion.

Formula: This criterion has a maximum of 3 points. If 20 % or more of the utilities are within the floodplain or riparian zone, the applicant will receive a score of 0. If less than 20 % of the utilities are within the floodplain or riparian area, the applicant will receive points ranging from 3 to 0 based on a

linear equation using the percentage of utilities within the floodplain or riparian area. See Figure 12 in Appendix A.

2. How are utility stream crossings planned?

Purpose: This criterion encourages use of aerial crossings or directional bore for stream crossings by utilities. These techniques are preferred to open cutting for crossing streams with utilities.

Explanation: Open cutting stream beds for utility burial often leads to stream bed and bank instability and can severely alter habitat by the placement of rip-rap. Directional boring does not disturb the stream bed and can avoid removal of riparian buffer vegetation. Burying utilities in roadway fill also minimizes impacts to streams and riparian areas. If there are no identified streams on the property, this criterion is automatically not applicable.

Formula: To receive 3 points for this criterion, all utilities must cross streams using one of the 3 methods listed. If any stream crossings are done using another method, such as open cutting, 0 points will be awarded.

P. Impervious Surfaces

1. Are road impacts minimized?

Purpose: This criterion encourages the applicant to reduce the amount of impervious surfaces by minimizing road width. By reducing road width, the applicant will reduce hydrological impacts caused by impervious surfaces as well as reduce the amount of clearing and disturbance needed to create a road.

Explanation: Road width can be reduced by minimizing the width of 2-lane roads, using 1-lane roads, or using 1-lane roads with pull-offs. Two-lane roads must be 20 feet wide or narrower to comply with this criterion. One-lane roads must be 10 feet wide or narrower. The applicant should check with the local emergency medical services (EMS) to ensure compliance with local rules about road widths. If local EMS will not allow road widths sufficiently narrow to earn points for this criterion, documentation is needed and this criterion will not apply. The applicant will need to change the applicable column value from “1” to “0” if local codes do not allow narrow roads as described in this criterion.

Formula: This formula examines the percentage of the road network that is 20 feet wide or less, a 1-lane road, or a 1-lane road with pulloffs. For overall calculation purposes, the maximum number of points for this criterion is considered 4, but it is possible to generate more than 4 points for this criterion if a high percentage of the road network is either 1-lane or 1-lane with pulloffs.

2. List the percentage of imperviousness of the entire tract.

Purpose: This criterion encourages the applicant to reduce the overall amount of impervious surfaces in the development. Reducing impervious surfaces reduces impacts from stormwater runoff.

Explanation: The applicant needs to estimate the amount of impervious surfaces such as roads, driveways, rooftops, sidewalks, patios, and parking lots that are expected in the development. The cumulative size of driveways and rooftops can be estimated based on the expected setback distance and house size or footprint. If stormwater BMPs such as permeable pavement or green roofs will be used, they should not be included when calculating the total amount of impervious surfaces.

Developments within city limits typically have higher housing densities and concentrating development in urban areas away from wildlife habitat is generally beneficial to wildlife. Considering this, this criterion has different formulas for development within and outside of city limits. Additionally, there is a third

formula that applies when the development is within a 14 digit HUC that contains a Federally listed aquatic species. Applicants are encouraged to reduce impervious surfaces by reducing road widths and lengths as well as using permeable material where possible.

Formula: The three formulas compare the acreage of impervious surfaces with the acreage of the entire tract. Developments within city limits can receive more points for a given amount of imperviousness. For example, if a development has 15 % imperviousness, it will earn 3.8 points if it is within city limits, 2.0 points if it is outside city limits, and 0.8 points if it is within a 14 digit HUC with Federally listed aquatic species. Although all 3 formula results are shown, the appropriate formula is automatically selected. See Figure 13 in Appendix A.

3. What measures will be taken to reduce impervious surfaces?

Purpose: This criterion encourages the applicant to take specific steps that will reduce impervious surfaces in the development. Reducing impervious surfaces reduces impacts from stormwater runoff. The areas addressed in this criterion are visible areas that can be used to help residents and the public understand what they can do to reduce imperviousness and stormwater runoff impacts.

Explanation: This criterion rewards applicants for limiting the width of driveways, reducing the number of sidewalks, and using permeable materials for sidewalks. To qualify for the driveway width part of this criterion, there must be language in the restrictive covenants establishing a maximum driveway width. All of the driveways must be less than a given width to qualify. For sidewalks, the conditions must apply to the majority of the development. For example, if there is only 1 sidewalk along 80 % of the roads but 20 % of the roads have sidewalks on both sides, the applicant should choose sidewalks on only one side. To qualify for the third part of this criterion, all sidewalks and / or all driveways must be made of permeable materials. For example, if all sidewalks were made of permeable materials, but driveways were not, the applicant would earn 0.5 points. If there are no sidewalks in the development, the applicant will receive credit for sidewalks made of permeable materials and earn 0.5 points (regardless of driveway materials).

Formula: Applicants should enter the appropriate number in the black cells in column *D*. Note that while the maximum points for each of the three components of this criterion add up to 3.5, there is a maximum of 2.5 points for this criterion.

4. Is the road density of the entire tract less than 3 miles of road per square mile? (EXTRA CREDIT)

Purpose: This extra credit criterion encourages minimizing the road network within a development.

Explanation: Research has shown that cumulative impacts to aquatic ecosystems from extensive road networks can be significant. Road network densities of over 3 miles of road/square mile are strongly correlated to extirpated trout populations in the eastern United States. It is likely that sediment impacts from high road densities lead to the impacts on aquatic ecosystems. Reducing road network density will also have a positive effect on terrestrial species by reducing road-crossing mortality and habitat fragmentation.

Formula: Road network densities less than 3 mi/mi² will receive 3 extra credit points. Road network densities greater than or equal to 3 mi/mi² will receive no points.

Q. Trails

1. Have trails been designed to include the following?

Purpose: Trails can be assets in a development because they promote nature-based activities and allow residents access to natural areas in a controlled way. This criterion encourages developers to include trails in their developments and provides a list of characteristics that will maximize the benefits of trails while minimizing their impacts.

Explanation: Six characteristics are used to evaluate trails. If the answer to the questions for each characteristic is yes, the applicant should type “yes” in the corresponding cell in Column *D*. For the second characteristic, the applicant should enter the 1, 0.5 or 0 in the corresponding cell. Co-locating trails with existing disturbances limits the amount of overall disturbance (first characteristic). Scores for the second characteristic are based on the majority of the trail surface. To qualify for the third characteristic, the portion of the trail that is walked upon cannot be wider than 6 feet (on average). Additionally, the area that is maintained (mowed, vegetation trimmed, etc.) cannot exceed 12 feet (on average). Note that the maintained width of 12 feet includes the width of the trail. If the trail (or portion of trail) is co-located with a disturbed area wider than 12 feet, this characteristic does not apply and the applicant should choose yes to receive points. Trails should avoid sensitive riparian areas such as erodible areas and avoid wetlands. If any trails pass through wetlands, the applicant must choose no to the fourth characteristic, but points can still be earned for the fifth characteristic if boardwalks or spanning structures are used when passing through wetlands and crossing streams. In wooded areas, it is important to maintain tree canopy closure. Applicants can choose yes to the sixth characteristic if the trail maintains an intact tree canopy. If no trails are planned, the applicant should change the applicability cell value from ‘1’ to ‘0’.

The layout and extent of trails is up to the applicant but the Review Team can provide assistance. Trails should be limited to non-motorized vehicles; the use of off-road vehicles is inappropriate in natural areas. Note that trails can also be impacts. For instance, trails made of impervious materials will count as impervious surfaces in the appropriate criteria. Trails can also count as riparian zone impacts; the extent to which they affect riparian zone scores depends on the materials used, width, and location of the trails within the riparian zone.

Formula: While the maximum points for each of the six components of this criterion add up to 6, there is a maximum of 5 points for this criterion.

R. Shoreline Concerns (Coastal Criteria)

1. Will shoreline stabilization occur?

Purpose: This formula discourages applicants from stabilizing shorelines using hard structures such as bulkheads and vertical walls. Such artificial structures create unnatural conditions and inhibit natural processes.

Explanation: This criterion assesses the length of shoreline and the percentage of shoreline that will be stabilized. Applicants will be penalized more for using hard structures rather than living shorelines, but both of these are considered inferior to natural shorelines. Living shorelines should use native species. The length of shoreline that has been stabilized in the past will not be considered when calculating the score for this criterion. Existing stabilized shorelines are opportunities for restoration.

Formula: Scores for this criterion are based on the length of natural shoreline that is stabilized with hard structures and the length of shoreline stabilized with living shorelines. Stabilizing shorelines with hard structures results in 4X more negative points than using living shorelines. If no shoreline stabilization is planned, the applicant will receive 0 points; points decline below 0 if stabilization occurs.

S. Water Access (Coastal Criteria)

1. If a planned marina is located in Class SA waters, how far is the proposed marina from open shellfishing waters?

Purpose: Class SA waters and open shellfishing waters are important for shellfish production. Development impacts can cause open shellfishing areas to be closed by the Shellfish Sanitation and Recreational Water Quality Section of NCDENR. This criterion discourages applicants from locating marinas in Class SA waters that are close to open shellfishing waters.

Explanation: This criterion assesses the distance between open shellfishing waters and the nearest marina slip. This criterion only applies if the marina is located in Class SA waters. If the marina is in Class SA waters, the applicant must report the shortest distance between the marina and the boundary of open shellfishing waters. This criterion is not applicable by default. If the marina is located within Class SA waters, the applicant must change the applicability cell value from '0' to '1'.

Formula: Scores for this criterion range from - 5 to 5 depending on the distance from the marina to open shellfishing waters. If the marina is located within open shellfishing waters (a distance of 0) the applicant will receive - 5 points. If the marina is located 2,000 feet or more from open shellfishing waters, the applicant will receive the maximum score of 5 points. If the marina is located 1,000 feet from open shellfishing waters, the score for this criterion will be 0. See Figure 14 in Appendix A.

2. Are dock and marina slips or ends of boat ramps proposed in normal water level depths less than 3 feet?

Purpose: This criterion discourages docks and marina slips in shallow water. When docks and marina slips are located in shallow water, boat motors can scour the bottom and increase turbidity. Also any submerged aquatic vegetation (SAV) in the area will be impacted.

Explanation: To avoid a 6 point penalty for this criterion, all marina slips must be in water with a normal water level 3 feet deep or deeper. If one or more marina slip is located in water less than 3 feet deep, the applicant will receive a score of - 6. Also, if the end of the boat ramp occurs in water less than 3 feet deep at normal water level, the applicant will receive - 6 points.

3. Is dredging proposed?

Purpose: This criterion discourages dredging. Dredging alters bottom topography and impacts the natural processes occurring in shallow water including SAV growth.

Explanation: This criterion assesses the area (in square feet) impacted by dredging. Not all dredging impacts are equal. Dredging a previously undredged area is weighted two times as much as maintenance dredging. Dredging an area that has been dredged previously but has naturalized is weighted between the other two categories. Maintenance dredging applies to the routine removal of accumulated sediment. Naturalized areas have been dredged in the past but over time have regained features similar to surrounding areas that have not been dredged.

Formula: Scores for this criterion are based on the area dredged and the condition of the area prior to dredging. If no dredging occurs, the score for this criterion is 0. If dredging occurs, the score will be negative; there is no floor or lower limit to the score.

4. Will Submerged Aquatic Vegetation (SAV) be impacted by shading or dredging?

Purpose: This criterion discourages dredging in areas where SAV is located and discourages shading, which can limit SAV growth. SAV provides important spawning, feeding and rearing habitat for

numerous species of finfish and shellfish. SAV also helps maintain water quality. Development of boat ramps, docks, marinas, and dredged channels should avoid SAV beds and shallow bottom habitats.

Explanation: This criterion is similar to I.S.3 above in that it penalizes applicants for dredging based on the area dredged. It also penalizes applicants for shading SAV, but dredging is weighted twice as much as shading.

5. Are individual lot owners allowed private docking facilities if a marina is present?

Purpose: This criterion discourages applicants from allowing private docking facilities for residents when a marina is planned. The overall impacts will be less if a marina is built than if private docks are built instead of, or in addition to, the marina.

Explanation: If a marina is planned for the development and any residents are allowed to have private docking facilities, the applicant will lose the opportunity to earn 4 points.

6. Will the following services be available at the marina?

Purpose: This criterion encourages applicants to allow non-residents to have full access to marinas within the development and also encourages services that are important to help maintain water quality, prevent fish kills, and reduce other environmental impacts.

Explanation: This criterion addresses 4 characteristics of marinas: public access, pump out service, cleanup service, and dockmasters. If marinas within the development allow non-residents the opportunity to launch boats and provide them with the same amenities as residents, 2 points will be awarded for this characteristic. If a dockmaster is present at the marina, 1.5 points are awarded. If the marina has pump out service to remove the contents of waste holding tanks, 2 points are awarded. If the marina has cleanup service to clean up oil and gas spills, 1 point is awarded.

Formula: Applicants should enter yes or no in the black cells corresponding to each characteristic. Note that while the maximum points for each of the 4 components of this criterion add up to 6.5, there is a maximum of 5.5 points for this criterion.

7. What is the ratio of marina slips to lots?

Purpose: The purpose of this criterion is to encourage applicants to limit the marina footprint, thereby limiting impacts to natural resources.

Explanation: This criterion assesses the ratio between the number of individual lots in the development and the number of slips in the marina. To maximize the points from this criterion, applicants should limit the number of marina slips to less than one per lot.

Formula: This criterion has a maximum of 4 points; maximum points are reached when the ratio of individual lots to marina slips is 2:1 or greater. As this ratio decreases (or the percentage of lots with slips increases above 50 %), the number of points decreases. If the ratio of slips to lots is 1:1, 0 points are awarded. If there are more slips than lots, the score is negative. See Figure 15 in Appendix A.

8. Will the development have a marina located in an upland basin instead of a natural water body?

Purpose: The purpose of this criterion is to encourage applicants to create upland basins for marinas rather than constructing marinas on natural water bodies. Creating upland basins limits impacts to aquatic resources.

Explanation: If an upland basin is used (can be created or pre-existing) for a marina rather than constructing a marina on a natural water body, the applicant will earn 5 points.

9. If an upland basin is planned, is a connection to natural surface waters proposed?

Purpose: The purpose of this criterion is to encourage applicants using upland basins to not connect them to surface waters. If an upland basin is connected to surface waters, riparian and shallow water areas will be dredged to allow boat traffic. If there is no surface connection, impacts to riparian and shallow water habitats are reduced and gas and oil from spills as well as everyday contact are contained within the upland basin.

Explanation: When an upland basin is constructed for a marina, boats must reach surface waters either through a surface water connection or they must be lifted overland between the upland basin and natural surface waters. If no surface water connection is planned, the applicant will earn 2 points. If the upland basin and surface waters will be connected, 0 points are awarded. Note that this criterion is specific to marinas in upland basins in coastal counties.

T. Restoration (EXTRA CREDIT)

Overview: All criteria in this section are extra credit and have similarities that will be discussed in the Overview; details are elucidated below with individual criteria. Unless otherwise specified, all conditions stated in the Overview apply to all criteria in the T. Restoration section. Potential restoration areas will be discussed during the IC. Credit will only be given for restoration that is suggested during the IC. Credit is only available for restoring areas that were impacted before the development process began. For example, credit will not be given for restoring a riparian area that was deforested when the tract was being prepared for development. Restored areas are considered natural areas if they meet the definition of natural areas. Only native species should be used in restoration activities. **Sometimes restoration is required as part of permit; in such cases, areas restored will not be eligible to receive extra credit points.** Unless otherwise indicated, there is a five year monitoring period to ensure that the restoration is successful. If the restoration is not successful, the applicant will have an opportunity to make the restoration successful. If no corrective action is taken and the restoration is not successful, points will be revoked. Because these criteria are extra credit, there is no maximum point value; available points will vary with the size of the area restored.

1. Does the property contain converted wetlands?

Purpose: This criterion allows the applicant to get additional points by restoring wetlands that have been filled, drained or substantially altered.

Explanation: Wetland restoration is a way to reestablish significant, high value wildlife habitat. Wetlands offer habitat diversity and often store and treat stormwater, mitigate flooding, buffer surface waters and serve as groundwater recharge sites. Wetland restoration is often required as a condition of Clean Water Act and Coastal Management Act permits, but no credit will be given for restoration required as a permit condition.

Formula: If areas of converted wetlands are noted during the IC, restoration potential will be discussed. Point values are based on the percentage of wetland acreage suggested for restoration that is restored as well as the acreage of the restored area.

2. Does the property contain streams that would benefit from stream restoration?

Purpose: This criterion encourages restoring degraded streams that will benefit from restoration.

Explanation: Streams provide a variety of important habitat functions for multiple life stages of both terrestrial and aquatic animal populations. Restoring these habitat types and their hydraulic function is a valuable restoration tool. Streams are often altered from their original state through channel modification, water diversion, culverting, and channel relocation. Many active and passive stream restoration techniques are now available to accomplish restoration activities. Specific methods for stream restoration will be discussed during the IC.

Formula: If portions of streams needing restoration are identified during the IC, restoration potential will be discussed. Point values are based on the percentage of stream length suggested for restoration that is restored as well as the length of restored stream.

3. Does the property contain riparian areas that would benefit from riparian restoration?

Purpose: This criterion encourages restoring degraded riparian areas that will benefit from restoration.

Explanation: Riparian restoration is a way to reestablish significant, high value wildlife habitat that borders streams and other surface waters. Riparian areas offer habitat diversity, treat stormwater, mitigate flooding, and regulate water temperatures.

Formula: If riparian areas needing restoration are identified during the IC, restoration potential will be discussed. Point values are based on the acreage of the riparian zone suggested for restoration versus the acreage actually restored.

4. Are there areas that will not be developed that will benefit from terrestrial habitat restoration?

Purpose: Quality terrestrial wildlife habitats can often be created by restoring previously degraded landscapes. Participants can receive extra credit by restoring landscapes to provide habitat for priority wildlife species included in the NC Wildlife Action Plan.

Explanation: Degraded land that does not currently provide habitat to priority species of terrestrial wildlife can often be restored. Lands having the potential to restore quality habitat for priority species will be identified during the IC. Examples include monoculture forests such as pine plantations, agricultural fields, and other cultivated or previously impacted areas. To receive any extra credit points, restoration activities will have to be undertaken on at least 20 % of the acres identified during the IC.

Formula. Point values are based on the acreage of land suggested for terrestrial restoration versus the acreage actually restored. Points increase as the percentage of suggested acreage actually planned for restoration increases and as the acreage of land planned for restoration increases. In this way, applicants are rewarded for complying with suggestions made during the IC and for restoring a large amount of land.

5. Does the property contain drainage modifications?

Purpose: This criterion allows the applicant to earn extra credit points by removing drainage modifications that have altered surface or subsurface water movement within the development tract.

Explanation: This criterion may be linked to I.T.1. that gives credit for restoring converted wetlands but credit will also be given in this criterion. Lands used for agriculture or other purposes where water control is an issue often have ditches, drain tiles, pumps, flap gates, dikes or French drains installed to control surface or subsurface water levels. These water level alterations substantially change the vegetative

communities that can survive on the site and often allow the establishment of undesirable plant species. This can substantially change wildlife habitat values and cause shifts in biotic communities. The Drain Mod Program from the Natural Resources Conservation Service (NRCS) will be used to estimate the area of land restored by removing drainage modifications.

Formula: If areas that have had drainage modifications exist on site, restoration potential should be discussed during the IC. Point values are based on the acreage of land with drainage modifications suggested for restoration versus the acreage actually restored. Points increase as the percentage of suggested acreage actually planned for restoration increases and as the acreage of land planned for restoration increases. In this way, applicants are rewarded for complying with suggestions made during the IC and for restoring a large amount of land. This formula is the same as the one for I.T.4.

6. Will artificial barriers (aquatic or terrestrial) other than dams be removed or modified for passage?

Purpose: This criterion allows the applicant to earn extra credit points by removing aquatic or terrestrial barriers that are obsolete and detrimental to wildlife.

Explanation: Barriers, other than dams, are often artifacts of previous land use found on private lands or created to provide amenities. Examples include artificial waterfalls, culverts, paved roads in the riparian areas, fences, among others. The location of barriers should be shown on a map and discussed during the IC. Artificial barriers will be identified and recommended for removal during the IC. Credit will be given for replacing culverts with bridges (traffic or foot) or removing culverts when a crossing is no longer needed.

Formula: Point values are based on the number of artificial barriers suggested for removal versus the total number actually removed.

7. Are there plans to remove existing dams?

Purpose: This criterion allows the applicant to earn extra credit points by removing existing dams and restoring impoundments to free flowing conditions.

Explanation: Impoundments (in-line or off-channel) pose significant threats to aquatic populations. Dams present a physical barrier to normal species movement, spawning movements, and can be a barrier to genetic flow among populations. The temperature of water released from these impoundments is often warmer than the stream below the impoundment; this can have significant impacts to thermally sensitive species like trout. Flows below these impoundments can also vary substantially from natural stream flow due to the impoundment effect or because water is diverted for other uses. In addition, in-line ponds represent a significant threat for the introduction of exotic invasive species because these ponds are typically stocked by the landowners.

Formula: Dams on the property will be identified during the IC. Point values are based on the number of dams suggested for removal versus the total number actually removed and the length of impounded aquatic habitat that is restored to free flowing conditions.

8. Are there opportunities to restore coastal marsh on the property? (Coastal Criteria)

Purpose: This criterion allows the applicant to earn extra credit points by restoring coastal marsh habitat to areas where it no longer occurs or is impacted.

Explanation: Coastal marsh restoration is a way to reestablish significant, high value habitat. Refer to the NC Sea Grant publication [Salt Marsh Restoration: Coastal Habitat Enhancement](#) for more information.

Formula: Point values are based on the acreage of coastal marsh suggested for restoration during the IC versus the acreage actually restored. The formulas are the same for this criterion and I.T.1.

9. Does the property contain shoreline stabilization structures (bulkheads, vertical structures) that can be removed to restore the shoreline? (Coastal Criteria)

Purpose: This criterion allows the applicant to earn extra credit points by restoring shorelines that have been previously stabilized with hard structures. Removing shoreline stabilizing structures restores natural shoreline processes.

Explanation: Sections of stabilized shoreline that have the potential to be restored will be identified during the IC. If all stabilizing materials are removed and the shoreline is restored to natural conditions without the need for materials and techniques associated with living shorelines, the applicant can earn credit for restoring the shoreline to natural conditions. If the applicant plans to create a living shoreline using rock sills and wetland enhancements, the applicant should enter the shoreline length for this condition.

Formula: Point values are based on the length of shoreline suggested for restoration during the IC versus the length restored. Shoreline restored to natural conditions without any living shoreline materials or techniques receives 1.5 times as much extra credit per linear foot as shoreline restoration using living shoreline materials and techniques.

SCORING CRITERIA – SECTION II

Development Construction and Post Construction

Section II criteria apply once construction begins. There are fewer criteria in Section II than in Section I, and most of these criteria relate to sedimentation and erosion control and regulatory compliance during construction. Section II criteria also address homeowner education and nature-based activities.

A. Sedimentation and Erosion Controls

1. Do sediment and erosion control measures meet or exceed Design Standards in Sensitive Watersheds?

Purpose: Providing better sedimentation and erosion control measures protects streams and wetlands and ensures that runoff does not adversely affect adjacent property owners or downstream resources.

Explanation: The use of higher quality sedimentation and erosion control devices and increasing the size of those devices may better control sediment loss from the construction site. The use of innovative measures such as PAM (Anionic polyacrylamide) in soils with high clay content is encouraged. Specific measures are listed in [15A NCAC 04B .0124](#). If the use of “Design Standards in Sensitive Watersheds” is a permit requirement, this criterion is not applicable and the applicant should change the value of cell I-10 from ‘1’ to ‘0’.

Formula: Point values are 6 points if “Design Standards in Sensitive Watersheds” are used and zero points if they are not.

2. Are required S&E control measures (sedimentation basins, retention ponds) converted to permanent stormwater retention ponds / wildlife habitat features? (EXTRA CREDIT)

Purpose: Certain sedimentation and erosion control measures, if allowed to naturalize, continue to perform important pollutant removal functions and can provide important ephemeral habitats for wildlife. These areas also may provide important habitat diversity and refugia, especially during droughts.

Explanation: If sedimentation and erosion control measures are located in areas where they may provide wildlife habitat functions or provide additional protection to surface waters, these devices can remain in place. Removing any support fencing and filter fabric and allowing native vegetation to establish is required to receive credits. These areas should not be mowed or otherwise maintained.

Formula: Extra credit points are based on the percentage of devices left in place. This criterion has a maximum of 2 points; each device yields 0.2 points.

B. Regulatory Compliance

1. Does the development comply with all DWQ, USACE, or DCM rules and regulations without any violations?

Purpose: This criterion ensures the development complies with all laws and regulations of state agencies, namely the Division of Water Quality (DWQ) and Division of Coastal Management (DCM) and federal rules of the US Army Corps of Engineers (USACE).

Explanation: Permits issued or required by the listed agencies protect wetlands and surface waters from unauthorized impacts. It is critical that the construction phase of a Wildlife Friendly Development not adversely affect streams and wetlands on the project site or impact off-site resources. Applicants are expected to comply with all permit conditions and applicable regulations.

Formula: Point values are based on compliance; 0 points are awarded for no violations and - 5 points if there are one or more violations.

2. Do construction activities avoid moratoria described in permit conditions?

Purpose: This criterion, if applicable, ensures that construction activities avoid critical times during the life cycle of aquatic organisms.

Explanation: Certain times of the year are critical for spawning, migration and growth of aquatic wildlife. Construction activities that occur in or immediately adjacent to streams or wetlands may need to be timed to avoid these times of peak biological activity. When applicable, permit conditions will specify when construction activities should not occur. These times will vary with the species involved and region of the state. There may be circumstances where conditions warrant allowing work within these critical timeframes. If this occurs subsequent to permitting and permits need to be modified or permission is given to work within an established moratorium, no points will be awarded. The applicant must determine whether or not this criterion is applicable.

Formula: Point values are based on simple yes or no; 5 points are awarded for adhering to the recommended moratoria.

3. Does development comply with all DLR rules and regulations without any Notices of Violation?

Purpose: This criterion ensures that construction activities adhere to the sedimentation and erosion control plan and comply with all applicable Division of Land Resources (DLR) regulations.

Explanation: Notices of Violation are issued by the DLR as legal notification that activities have violated regulations and must be remedied.

Formula: Negative point values are based on - 5 points for each NOV.

4. Does applicant voluntarily submit DLR and DWQ reports indicating compliance with DLR and DWQ rules and regulations to NCWRC contact?

Purpose: This criterion allows NCWRC to easily assess compliance with DLR and DWQ regulations to score items II.B.1 and II.B.3.

Explanation: Wildlife Friendly Developments are expected to comply with all applicable DLR and DWQ rules and regulations. This can be easily assessed by examining site inspection and compliance reports from these agencies. Although NCWRC can obtain copies of these reports by other means, it will be much less time consuming and demonstrate a spirit of cooperation on the part of the applicant if these reports are voluntarily submitted for inspection.

Formula: Point values are based on simple yes or no; 5 points are awarded for voluntarily submitting reports.

C. Landscaping

1. Was native (locally expected) vegetation used for all landscaping done by the developer?

Purpose: This criterion encourages the use of native vegetation in landscaped areas over non-native vegetation that may not benefit wildlife and has the potential to spread into natural areas.

Explanation: This criterion addresses areas landscaped by the developer such as entrances, community buildings, and landscaping around homes. Each landscaped area or unit must consist of 100 % native vegetation to receive any points. While there are many plants native to North Carolina, most are not typically found throughout the state. For example, longleaf pines are not native to the mountains and mountain laurel is not found in coastal counties. The vegetation of landscaped areas should mimic that of the surrounding landscape. [Landscaping for Wildlife with Native Plants](#) published by the North Carolina Cooperative Extension Service is a good resource that lists native plants with wildlife benefits, discusses techniques for landscaping with native plants, and lists sources for plants.

Formula: This criterion has a maximum of 4 points and assesses the percentage of landscaped areas that consist entirely of native (locally expected) vegetation. To receive any points, at least 25 % of the landscaped areas must have all native species. See Figure 16 in Appendix A.

2. Are any non-native invasive plants identified in [Landscaping for Wildlife with Native Plants](#) used in landscaping?

Purpose: This criterion discourages applicants from using non-native invasive plants in landscaped areas. Invasive plants typically spread into natural areas and out compete native plant species.

Explanation: This criterion also addresses areas landscaped by the developer such as entrances, community buildings, and landscaping around homes. If any non-native invasive plants listed in Table 3 on page 9 of [Landscaping for Wildlife with Native Plants](#) are used in the development, points will be deducted.

Formula: This criterion rewards developments with no non-native invasive plants with 3 points. If any non-native invasive plants are used, the applicant will receive a score of - 4 for this criterion.

3. What is the water source for all landscaped areas (not in individual lots)?

Purpose: This criterion encourages applicants to use vegetation appropriate for their climate and to conserve water by not using potable water to maintain landscaped areas.

Explanation: This criterion rewards developments that use water wisely with 2 points. To qualify, the development cannot irrigate any community landscaped areas with potable water, unless it is done by hand. The development can use irrigation lines if the water source is collected rainwater or reused (gray) water. Note that this does not apply to individual lots, only places such as entrances and community areas.

4. What percentage of lighting fixtures used in non-residential structures are dark sky friendly?

Purpose: Artificial night lighting negatively impacts a wide range of wildlife. Artificial night lighting has been shown to disorient migratory birds and hatchling turtles, disrupt mating and reproductive behavior in amphibians, and generally interfere with communication, navigation, and movement in a wide range of species. The purpose of this criterion is to reward developers who choose to install dark sky friendly lighting fixtures. Dark sky friendly lighting fixtures are luminaries that have been approved by the International Dark Sky Association (IDSA) to effectively minimize the glare and light pollution that negatively impacts many species.

Explanation: To receive credit for this criterion, at least 50% of all non-residential lighting fixtures must have the IDSA fixture seal of approval (FSA). Non-residential lighting structures include any light fixture not associated with an individual lot. Examples include lights on facades and signs, lights on community buildings, lights in parking lots, on roadways, or pedestrian pathways. Approved dark sky friendly [lighting fixtures and manufacturers](#) can be found on the IDSA website.

Lighting exempt from this criterion includes:

- Lighting in swimming pools and other water features governed by Article 680 of the National Electrical Code
- Exit signs and other illumination required by building codes
- Lighting for stairs and ramps, as required by building codes
- Holiday and temporary lighting (permitted from Thanksgiving through 15 January, and 30 days maximum at any other time of year)
- Low voltage landscape lighting, but such lighting must be shielded in such a way as to eliminate glare and light trespass

Formula: If 50 - 74% of non-residential lighting fixtures are dark sky friendly, one point will be awarded. If 75 - 99% of fixtures are non-residential lighting fixtures are dark sky friendly, two points will be awarded. If all non-residential lighting fixtures are dark sky friendly, 3 points will be awarded.

5. Do covenants require dark sky friendly luminaries to be used in outdoor lighting fixtures associated with residential structures?

Purpose: As explained in the previous criterion, artificial night lighting negatively impacts a wide range of wildlife. The purpose of this criterion is to reward developers who write covenants that will require future residents to install dark sky friendly lighting fixtures. Dark sky friendly lighting fixtures are luminaries that have been approved by the International Dark Sky Association (IDSA) to effectively minimize the glare and light pollution that negatively impacts many species. Installation of dark sky friendly lighting structures will help protect wildlife from the damaging effects of outdoor night lighting.

Explanation: To receive credit for this criterion, covenants must require residents to use dark sky friendly lighting fixtures that possess the IDSA fixture seal of approval in outdoor lighting fixtures. Approved dark sky friendly [lighting fixtures and manufacturers](#) can be found on the IDSA website.

The covenants may include appropriate exemptions for residents, including:

- Holiday and temporary lighting (permitted from Thanksgiving through 15 January, and 30 days maximum at any other time of year)
- Low voltage landscape lighting, but such lighting must be shielded in such a way as to eliminate glare and light trespass

Formula: To earn any points for this criterion, covenants must include language requiring future homeowners to use IDSA approved outdoor lighting fixtures. If covenants include such language, 2 points will be awarded. If they do not, 0 points will be given.

D. Instream Structures

1. Were all required temporary instream structures (diversions, intakes, pump arounds, etc.) removed and the stream restored to natural conditions?

Purpose: This criterion ensures no temporary instream structures are left in place altering flows and blocking aquatic life movements.

Explanation: Temporary instream structures are often required as conditions of DWQ or USACE permits. They are frequently associated with the construction of culverts, bridges, and utility line crossings. If left in place or only partially removed, they can cause stream bank instability and become barriers to aquatic life movements. If temporary instream structures are required, care should be taken to make sure no material is left in the stream bed, natural flow patterns are restored, stream banks are revegetated to prevent erosion, and floodplain areas are graded to the original elevations.

Formula: Point values are based on simple yes or no; 3 points are awarded for proper removal.

2. Were all permanent structures in water installed per design?

Purpose: This criterion ensures permanent in-water structures such as culverts, bridges, pipes, docks, boat ramps, and boardwalks are left constructed as designed.

Explanation: Permanent in-water structures, if installed improperly, can be barriers to aquatic life movements, cause stream bank instability, cause stream channel damage such as head cutting, be constant sources of sediment, shade or remove SAV, and have long term chronic affects on aquatic ecosystems. Structures located in water must be carefully designed and constructed to ensure they do not harm aquatic wildlife or their habitats. NCWRC biologists are available to discuss the designs and best management practices for the construction of these structures.

Formula: Point values are based on simple yes or no; 0 points are awarded for proper installation and if a structure is installed incorrectly, the value is - 3 points.

E. Soil Disturbance

1. Is clearing limited to 15 feet beyond the construction limits?

Purpose: This criterion ensures that soil disturbance is limited to what is required to construct project infrastructure.

Explanation: Most construction can be accomplished within 15 feet of a cleared area beyond the actual construction footprint. If possible, only vegetation should be removed in the 15 foot zone. Avoiding grading or stump removal minimizes the amount of bare soil exposed and allows vegetation to easily reestablish in the clearing limits. If the area is to be grassed, special care should be taken to reseed and mulch as the construction progresses rather than waiting until all grading and construction is complete before reseeding. This will minimize the amount of disturbed soil, cause less sediment loss during heavy rain events, and cause sedimentation and erosion control measures to function better and require less frequent maintenance.

Formula: Point values are based on simple yes or no; 3 points are awarded for clearing no more than 15 feet outside of construction limits and no points are awarded if wider areas are cleared.

2. Are natural areas designated and protected by marking and or fencing and maintained throughout construction?

Purpose: Properly marking the outer edges of natural areas makes workers aware of natural area boundaries and helps protect the habitat from damage during the construction phase.

Explanation: Protecting natural areas from damage during the construction phase is critical. By properly marking boundaries with fencing, flagging, or other appropriate marking, construction activities should not damage soils and vegetation in natural areas. Protective materials should remain in place until

all construction activities are completed. At that point, fencing, flagging, etc. should be removed. If all natural areas are designated and protected during construction, the applicant will receive 3 points.

F. Wildlife Friendly Sedimentation & Erosion Control Materials

1. Are natural or biodegradable sedimentation and erosion control materials used exclusively throughout the development?

Purpose: This criterion ensures that materials used to control sediment and prevent soil erosion do not pose a short or long term threat to wildlife.

Explanation: Some materials used to construct sedimentation and erosion control structures can persist in the environment long after the structure has fulfilled its intended purpose and can pose long term threats to wildlife. Synthetic materials especially nylon mesh, webbing, or fabric persist in the environment and can entangle both terrestrial and aquatic organisms. Natural materials made with jute, cotton, or coconut fibers can usually perform just as well as synthetic fibers, naturally breakdown, and do not pose the same threat to wildlife. NCWRC staff can help with the selection of appropriate materials.

Formula: Point values are based on simple yes or no; 4 points are awarded for exclusive use of natural or biodegradable materials and no points are awarded if synthetic materials and/or nylon mesh is used.

2. Are appropriate seed mixes used to stabilize soil?

Purpose: This criterion ensures seed mixtures used to revegetate natural areas or to control sediment and prevent soil erosion do not contain noxious or invasive species.

Explanation: Some seed mixtures are composed of primarily turf grasses with little or no wildlife benefit. More importantly, these mixtures may contain species with allelopathic properties that actually prevent native species of plants from reestablishing. Also some turf grasses out compete native herbaceous vegetation that provides food and habitat for wildlife. NCWRC approved seed mixtures can be found on page 137 of the Division of Forest Resources [Best Management Practices Manual](#). These seed mixtures should be used exclusively when seeds are planted.

Formula: Point values are based on simple yes or no; 3 points are awarded for use of the recommended seed mixtures and no points are awarded if other mixes are used.

G. Built as Designed

1. Were there deviations from the development conservation design during construction?

Purpose: This criterion helps ensure that the applicant follows through with plans evaluated in Section I and wildlife are not impacted by design changes.

Explanation: Section I of the scoring criteria evaluates what the applicant plans to do. If on the ground conditions differ from what is planned, the applicant is scored on what is on the ground. This is one mechanism by which the Review Team can ensure that what the applicant plans to do actually happens. This criterion provides another way to make sure there are no changes to the development design. This criterion will only look at large changes that impact wildlife. Minor changes are permissible, particularly if they have no impact on wildlife. Examples of changes that would result in a loss of points for this criterion are a change in stream crossing design or location, adding lots in place of a natural area, and rerouting a road resulting in inferior protection of Priority Habitat.

Formula: The applicant will receive 5 of 5 possible points if there are no deviations to the design. If there is one change, the applicant will receive 3 points and 0 points if there is more than one change.

H. Building Envelope

1. Is there a mechanism to control which trees are removed based on house design?

Purpose: This criterion encourages tree preservation on individual lots.

Explanation: When house design and position are considered prior to tree removal, disturbance to the landscape caused by grading can be minimized. Limited grading and tree removal means more wildlife habitat and less sedimentation and erosion control problems. If lots are cleared without regard for house design and position, a larger area of land will be disturbed. To qualify for this criterion, the applicant should have building envelopes that dictate the location of structures and the extent of grading. In addition there should be a mechanism for determining which trees should be removed based on the design and position of the house within the building envelope. If such mechanisms are in place, the applicant will receive 2 points. If there are no trees on the tract, this criterion does not apply and the applicant should change cell I-82 from '1' to '0'.

2. Are lots cleared before they are sold?

Purpose: This criterion encourages the applicant to preserve trees on individual lots and limit impacts caused by grading.

Explanation: This criterion is similar to the previous one because they both encourage tree preservation and reduced impacts from clearing. If lots are cleared before they are sold, tree removal cannot be tied to house design. Additionally, larger amounts of land will be cleared at one time if lots are cleared before they are sold. Clearing lots after they are sold limits the amount of disturbance that occurs at any one time and allows house design to be considered when trees are removed. If there are no trees on the tract, this criterion is not applicable and the applicant should change cell I-85 from '1' to '0'.

Formula: If none of the lots are cleared before they are sold, 2 points are awarded. If less than 25 % of the lots are cleared before they are sold, 1 point is awarded, otherwise no points are given.

I. Covenants

1. Do homeowners association covenants explain how to protect natural areas and maintain Wildlife Friendly Development Certification?

Purpose: Educating homeowners to protect the natural features of their development is an important part of any Wildlife Friendly Development project. This criterion simply encourages applicants to include language in covenants that adequately explains to homeowners the value of the natural resources in their development and how to protect those natural features.

Explanation: To receive credit of 2 points for this criterion, the applicant needs to include covenants that explain to homeowners what can and cannot occur within the development and how this affects the natural features of the development and can potentially affect certification. The Review Team will review the covenants and can also provide examples to go by.

J. Homeowner Education

1. What techniques are used to educate homeowners?

Purpose: Educating homeowners on the value of wildlife habitats located in their neighborhood is an important part of any Wildlife Friendly Development project. The purpose of this criterion is to reward applicants who develop environmental education materials or activities for current and future residents.

Explanation: To receive credit for a homeowner education technique, applicants must provide adequate evidence that a particular educational strategy is being used or will be used in the near future.

Organized community stewardship activities include activities that involve residents in natural area management or restoration. Examples include an organized yearly stream clean up day or organized volunteer events to remove invasive species on site. Because community stewardship activities actively engage residents in both learning about and contributing to management of wildlife habitats in their community, applicants receive the most points for organizing this type of educational activity.

Guided environmental education activities include guided nature walks, presentations, or workshops designed to teach residents about wildlife habitats, species, or other environmental topics related to their neighborhood. Examples could include presentations on creating a backyard wildlife habitat or a guided birding walk.

Because kiosks and printed materials are more passive ways of educating homeowners about environmental resources on site, these educational techniques will receive the least amount of points. Environmental education kiosks are large signs and bulletin boards with information, maps, and/or pamphlets about wildlife habitats and natural areas in the community. Environmental education materials can consist of websites, brochures, or booklets.

Formula: If acceptable evidence is provided, applicants will receive points for each type of homeowner education activity that is in progress or planned. Applicants can receive up to 7 points for this criterion. Applicants will receive 3 points for organized community stewardship activities. Applicants that provide proof they have organized or plan to organize guided environmental education activities for residents will receive 2 points. One point will be given for the presence of environmental education kiosks, and one point will be given for environmental education materials.

K. Access for Nature-Based Activities

1. Has appropriate public access for nature-based activities been established? (EXTRA CREDIT)

Purpose: Public access to nature-based recreational opportunities on private lands in North Carolina has been declining for decades. Some developments have a sufficient amount of undeveloped land, or resources such as stream frontage, to allow activities such as hunting, fishing, hiking, or bird watching. This criterion rewards developments that allow appropriate public access to nature-based recreational opportunities on their property.

Explanation: Public access provides non-residents with the same access opportunities as residents of the development. Appropriate access does not jeopardize the future viability of the habitat. Access points, trails, and parking must be considered when public access is provided.

Formula: Up to 5 extra credit points can be earned for this criterion. The applicant can earn 3 points each for allowing public hunting and fishing on portions of the development tract. If the public is allowed to engage in birding and hiking activities on the development tract, one point is awarded for each activity.

2. Has resident access for nature-based activities been established? (EXTRA CREDIT)

Purpose: This criterion encourages nature-based recreational opportunities for residents on the development property.

Explanation: This criterion is designed to promote nature-based recreational opportunities for residents of a development. Exposure to nature-based recreational opportunities can increase the conservation awareness of residents and provide valuable educational opportunities. This criterion rewards developments that create resident access to nature-based recreational opportunities on development property.

Formula: Up to 4 extra credit points can be earned for this criterion. The same categories used in II.K.1. are used in this criterion but the point values are reduced.

SCORE SUMMARY

The Score Summary worksheet summarizes the number of points accumulated in Sections I and II as well as extra credit criteria. It is updated as changes are made to the previous worksheets and lets the applicant know if there are enough points for certification. A message will indicate if the applicant has earned enough points for Sections I and II or if more points are needed for either section. If Sections I and II have at least 50 % of the needed points and the overall Percent Score is 55 % or higher, the development can be certified and a message will appear in the lower right corner indicating that there are sufficient points for certification.

DEFINITION OF TERMS

Acid-bearing rock formations – Acid-bearing rock (pyritic or Anakeesta) formations are found in parts of the North Carolina mountains and can decrease the pH of runoff or surface waters when disturbed, which can harm aquatic systems.

Artificial barriers – Any man-made structure that can inhibit the movement of aquatic or terrestrial wildlife. Examples include dams or culverts that are too long, perched, or otherwise reduce the movement of aquatic animals past the culvert. Additionally, fences and walls can hinder terrestrial wildlife movement.

Bioretention area / rain garden – A landscaped depression that collects surface water runoff. It collects water and allows it to soak into the ground rather than contributing to stormwater runoff. <http://www.bae.ncsu.edu/topic/raingarden/>

Bottomless arch culvert – Spanning structure used to cross a stream. The stream bottom remains unchanged using bottomless culverts, which are mounted on footings. Bottomless arch culverts and bridges allow for natural stream channel processes which promote good stream habitat and do not impede movement of fish and other aquatic life. To qualify as a spanning structure for WFDC, a bottomless arch culvert must be placed 15' or 1 bankfull width from the top of the bank on each side of the stream. <http://www.fws.gov/midwest/fisheries/StreamCrossings/ReplacementStructures.htm>

Bridge – Spanning structure used to cross a water body. Bridges do not impede aquatic life movement and cause fewer impacts to stream habitat and inhabitants than culverts.

Buried streams – Buried streams do not allow sunlight penetration because they pass through pipes or culverts. Streams crossed with spanning structures such as bridges or bottomless arch culverts are not considered buried.

Class SA waters – Class SA waters is a primary surface water classification of North Carolina's Water Quality Standards Program. Class SA waters are the highest classification for tidal salt waters used for commercial shellfish harvest. All Class SA waters are also classified as High Quality Waters (HQW). <http://portal.ncdenr.org/web/wq/ps/csu/classifications>

Cleanup service – A service provided by a marina to clean up and manage spills of hazardous biological or chemical compounds before they affect water quality or harm aquatic systems.

Coastal counties – The NC Division of Coastal Management administers rules and regulations that pertain to the 20 coastal counties in the state. These counties are: Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hertford, Hyde, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, and Washington.

Coastal marsh – The NC Division of Coastal Management defines coastal marsh as “any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides (whether or not the tide waters reach the marshland areas through natural or artificial watercourses), provided this does not

include hurricane or tropical storm tides.” Coastal wetlands may contain the following marsh plant species: (1) Cord Grass (2) Black Needlerush (3) Glasswort (4) Salt Grass (5) Sea Lavender (6) Bulrush (7) Saw Grass (8) Cat-tail (9) Salt Meadow Grass (10) Salt Reed Grass

Conservation easements – Conservation easements are legally binding agreements between landowners and third parties, such as conservation organizations or government entities, that limit certain uses of the land in perpetuity.

Converted wetlands – Land that was once a wetland but has been modified so that it no longer functions as a wetland. In the past wetlands were often drained by ditches to lower the water table and allow the land to be cultivated. These areas should be considered for restoration.

Core Area – An area of a specified width surrounding a wildlife habitat feature.

Culvert design criteria – Culverts greater than 48” in diameter must be buried at least one foot below the bed of the stream. Culverts 48” in diameter or less must be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain the existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions.

Curb and gutter – A system of impervious channels meant to collect and direct stormwater runoff from roadways or parking lots to a discharge location.

Deed restrictions – Deed restrictions place limitations on the use of property. For the purposes of WFDC, developers can place deed restrictions on natural areas, which will be owned as common space by the homeowners association. These deed restrictions limit activities that can occur within the natural areas and ensure future protection.

Degraded – For the purposes of WFDC, degraded is used in reference to impacts to wetlands. Wetlands can be degraded by actions such as soil disturbance, vegetation removal or cutting, and by pesticide application. While jurisdictional wetlands may remain jurisdictional wetlands despite these changes, their function and integrity will be impaired by these activities. For the purposes of WFDC, impacts to wetlands go beyond dredging and filling.

Design standards in sensitive watersheds – The sensitive watersheds standards apply to HQW (high quality water) classified waters and require more stringent measures for sedimentation and erosion control. For the purposes of WFDC, applicants can earn points for using these higher standards for all developments. Specific measures are listed in [15A NCAC 04B .0124](#).

Development clustering – Development in which individual lots may be smaller than the average lot authorized by the zoning ordinance. Buildable lots are located on a portion of rather than the entire site so that the residual area may be preserved for recreation or environmental protection.

Development footprint – The development footprint includes land in individual lots, community buildings, roads, and utilities. It differs from the development tract in that the footprint does not include land set aside as natural areas or as open space.

Development tract – The development tract is the entire tract of land on which the development occurs. It includes any natural areas that will not be developed as well as individual lots, common areas, roads, etc.

Diffuse drainage system – A series of grassed swales, level spreaders, and sheet flow areas meant to spread stormwater discharge over a large area; promoting ground infiltration, sediment and pollutant removal, streambank stability, and minimal hydrological effects.

Directional bore – Directional boring is a steerable, trenchless method used to install underground pipes. There is less impact on the environment because there is no open trench. This is an effective way to cross streams because pipe can be installed beneath the streambed without disturbing the streambed.

Drainage modifications – Changes made to the landscape to alter hydrology, such as drainage ditches, tiles, French drains, etc. that allows wet areas to be cultivated or otherwise altered.

Dry well – A dry well typically consists of a pit filled with large aggregate such as gravel or stone. Alternately, it may consist of a perforated drum placed in a pit and surrounded with stone. Dry wells are suitable for treating small impervious areas (as an alternative to infiltration trenches) and may be useful on steeper slopes where trenches or other facilities cannot be installed. Dry wells are particularly well suited to capture and infiltrate water from roof downspouts or driveways. The surface is typically at or just below existing grade. It may be covered by grass or other surface.

Entire tract – See development tract.

Ephemeral stream – An ephemeral stream is defined by the State of North Carolina as “a feature that carries only stormwater in direct response to precipitation with water flowing only during and shortly after large precipitation events. An ephemeral stream may or may not have a well-defined channel, the aquatic bed is always above the water table, and stormwater runoff is the primary source of water. An ephemeral stream typically lacks the biological, hydrological, and physical characteristics commonly associated with the continuous or intermittent conveyance of water.” [\[15A NCAC 02B .0233\(2\)\(d\)\]](#).

Extraterritorial Jurisdiction (ETJ) – The ETJ of a town or city is the area beyond the city or town limits that the city or town has some authority over. An ETJ will be outside of city or town limits but closer to the town or city than rural areas beyond the ETJ that only come under county government authority.

Farmland not otherwise designated – Farmland less suitable and productive for farming than prime or unique farmland or farmland of statewide importance.

<http://www.nc.nrcs.usda.gov/programs/soilsurvey/primefarmland.html>

Farmland of statewide importance – Farmland not good enough to qualify as prime farmland, but still productive for farming. <http://www.nc.nrcs.usda.gov/programs/soilsurvey/primefarmland.html>

Federally listed aquatic species – Any aquatic species in North Carolina that is currently listed as Federally Threatened or Federally Endangered on the Endangered Species List is a Federally listed species. Federal Species of Concern are not considered Federally listed. For a county listing of Federally listed species in NC: <http://www.fws.gov/nc-es/es/countyfr.html>

Forested – For the purposes of WFDC, forested indicates that an area has woody vegetation in some stage of natural succession. Trees could have been recently harvested or the area could have mature trees. In most cases, forested areas should be allowed to grow naturally. If there are no trees in an area that needs to be forested, such as a riparian or wetland buffer, an appropriate mix of native trees and understory vegetation should be planted to provide forested conditions.

14 Digit HUC – The 14 Digit Hydrologic Unit Code (HUC) represents the smallest subbasin level used to classify watersheds in North Carolina. 14 Digit HUCs vary in size and shape based on the hydrologic features of watersheds.

Full public access – For the purposes of WFDC, full public access refers to marinas allowing the public, or non-residents of the development, to have the full use of the development's marina and associated services.

Green roof – Roofs covered with vegetation and growing mediums are green roofs. Green roofs have several benefits, but primarily they soak up water and reduce stormwater runoff. <http://www.bae.ncsu.edu/greenroofs/>. Green roofs that are planted with native plants beneficial to wildlife, and designed with wildlife in mind, can also serve as a wildlife habitat.

Hydrology – Hydrology is the study of water quantity, movement, and distribution. Development can affect the quantity, quality, and timing of water reaching nearby surface waters. A hydrograph is a graphical display of water volume or discharge over time.

Impacts – For the purposes of WFDC, impacts include, but are not limited to, roads with associated ditches and maintained right-of-ways, land in individual lots, utility corridors, vegetation clearing or cutting, soil disturbance, impervious surfaces, and pesticide application. Generally any condition inconsistent with natural areas is considered an impact.

Imperviousness – Imperviousness or impervious surfaces refers to areas covered with solid materials that are compacted to the point where water cannot pass through to underlying soils. Impervious surfaces such as roof tops, roads, parking lots, driveways, and sidewalks increase the velocity and volume of stormwater runoff because water cannot soak into the ground beneath impervious surfaces.

Important Conservation Areas – Areas that have been previously mapped and designated by conservation organizations as important for wildlife conservation or management.

Impoundment – A manmade surface water body such as a pond or lake that is created using a dam or similar structure that alters the natural flow of water.

Inlet hazard – Inlet hazard areas are natural-hazard areas that are especially vulnerable to erosion, flooding, and other adverse effects of sand, wind, and water because of their proximity to dynamic ocean inlets. <http://dcm2.enr.state.nc.us/handbook/section3.htm>

In-line impoundment – A manmade surface water body such as a pond or lake that was created by damming an intermittent or perennial stream.

Intermittent stream – An intermittent stream is defined by the State of North Carolina as one with “a well-defined channel that contains water for only part of the year, typically during winter and spring when the aquatic bed is below the water table. The flow may be heavily supplemented by stormwater runoff. An intermittent stream often lacks the biological and hydrological characteristics commonly associated with the conveyance of water.” [\[15A NCAC 02B .0233\(2\)\(g\)\]](#).

Jurisdictional wetlands – To be classified as jurisdictional wetlands, an area must have positive evidence of 3 characteristics: hydric soils, hydrophytic vegetation, and wetlands hydrology. A Jurisdictional Determination (JD) is performed to delineate the boundary between jurisdictional wetlands and upland areas.

Level spreader – Level spreaders are stormwater management structures designed to diffuse concentrated stormwater runoff. Level spreaders cause concentrated flows to spread out into diffuse or sheet flow. <http://www.bae.ncsu.edu/stormwater/PublicationFiles/LevelSpreaders2006.pdf>

Living shoreline – Living shorelines provide erosion control benefits, stabilize shorelines, and enhance natural shoreline habitat using strategically placed plants, stone, sand fill, etc. <http://www.habitat.noaa.gov/restoration/techniques/livingshorelines.html>
<http://dcm2.enr.state.nc.us/estuarineshoreline/living%20shorelines.html>

Marina – A marina provides docking and storage for multiple boats. It may also provide services such as launching, dry storage, pump out service and refueling.

Mature, mixed native forest – For the purposes of WFDC, a mature, mixed native forest is comprised of multiple native tree species of various sizes that are at least 50 years old. Mature forests will also possess native mid-story vegetation and herbaceous plants.

Monoculture forest – A monoculture forest consists of planted trees and is dominated by one species of tree in an even-aged stand. A naturally occurring forest dominated by one species, such as a longleaf pine forest, is not considered a monoculture forest. While monoculture forests provide some wildlife benefits, native forests with a diversity of tree species and sizes provide benefits to a wider variety of wildlife species.

Moratoria – A moratorium (singular of moratoria) is a delay or suspension of activity, such as avoiding impacts to streambeds during fish spawning season.

Native (locally expected) vegetation – Vegetation that is both native and grows locally. For example, longleaf pines are native to North Carolina, but they are not locally expected in the mountains, just as mountain laurel is not locally expected in coastal counties.

Natural areas – For the purposes of WFDC, natural areas must 1) be in a common area, not in individual lots and 2) be in some stage of natural succession. Land such as riparian zones, wetlands, and wildlife corridors can also be considered natural areas. Land that will be restored, such as converted wetlands, can count as natural areas. Athletic fields and manicured lawns are not considered natural areas.

Natural or biodegradable sedimentation and erosion control materials – Natural or biodegradable erosion control blankets, matting, netting, or logs are designed to provide immediate

erosion protection and vegetation establishment assistance, then degrade after the root and stem systems of the vegetation are mature enough to permanently stabilize the underlying soil. These materials may include natural fibers such as jute, palm, or coconut husk and may also include a wide range of photodegradable synthetic fibers.

Nature-based activities – Activities that depend on nature such as hiking, fishing, hunting, bird watching, etc.

NCWRC Game Lands Safety Zone – The Safety Zone is an area 450 feet wide around NCWRC Game Lands recommended to minimize conflicts between Game Land uses and adjacent development.

Non-native invasive vegetation – Plants that are not native to North Carolina and have the potential to spread beyond areas where they are planted or are currently located. Any plant listed in Table 3 on page 9 of the document *Landscaping for Wildlife with Native Plants* http://www.ces.ncsu.edu/forestry/pdf/ag/ag636_03.pdf is considered nonnative invasive vegetation for the purposes of WFDC.

Normal water level – The level of water bodies with less than six inches of lunar tide during periods of little or no wind. It can be determined by the presence of such physical and biological indicators as erosion escarpments, trash lines, water lines, marsh grasses, and barnacles.

Notice of Violation – A Notice of Violation or NOV is a legal notification to a developer that he has violated a State or Federal regulation. NOV's routinely have a cease and desist statement plus a requirement to contact the NOV issuing authority.

Ocean overwash hazard – Ocean overwash hazard areas are low-lying areas along the coast that could be inundated by ocean waves during storm events.

100 year floodplain – The area along a water body that is expected to be flooded one time in 100 years.

One lane road – A road that is 10 feet wide or less. A one lane road is only wide enough for one car to pass through at a time.

One lane road with pulloffs – A road that is 10 feet wide or less and has wider areas that allow motorists to pull off the road but remain on a hard surface.

Open space – To qualify as open space for WFDC, land must 1) be in a common area, not in individual lots and 2) require only minimal maintenance but generally does not receive compaction, weekly mowing or excessive amounts of fertilizer or herbicides. Open space is similar to natural areas but natural areas are in some state of natural succession. Specifically, golf courses, wastewater spray fields and athletic fields (such as baseball or soccer fields) would not qualify as open space due to the compaction and maintenance associated with these uses. Note that for the purposes of WFDC, open space is not considered a natural area and an area with 10 % or more imperviousness is not considered open space. An open play field would qualify as open space.

ORW classified waters – Outstanding Resource Waters (ORW) is a supplemental surface water classification of North Carolina's Water Quality Standards Program. All ORW classified waters are

also classified as High Quality Waters (HQW). ORW classified waters are unique and special waters of exceptional state or national recreational or ecological significance which require special protection. <http://portal.ncdenr.org/web/wq/ps/csu/classifications>

Perennial stream – A perennial stream is defined by the State of North Carolina as one with “a well-defined channel that contains water year round during a year of normal rainfall with the aquatic bed located below the water table for most of the year. Groundwater is the primary source of water for a perennial stream, but it also carries stormwater runoff. A perennial stream exhibits the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water.” [\[15A NCAC 02B .0233\(2\)\(i\)\]](#).

Permeable pavement – Hard materials such as pavers or permeable concrete that allow water to flow through them to underlying soils are considered permeable pavement. Gravel is also considered permeable pavement. These materials reduce stormwater runoff by reducing impervious surfaces and allowing water to soak into the ground. <http://www.bae.ncsu.edu/info/permeable-pavement/>

Pervious impacts – For the purposes of WFDC, pervious impacts are separated from impervious impacts when calculating impacts to riparian zones. Pervious impacts have minimal effects on hydrology while impervious impacts exacerbate stormwater runoff. Pervious impacts include cleared right-of-ways, land in individual lots, and can include trails under some circumstances.

Pervious materials – See permeable pavement.

Previous industrial or commercial site – A previous industrial or commercial site was previously used for industry or commercial purposes and typically retains few natural features beneficial to wildlife. As a result, these areas are good for future development because they are already impacted by features such as impervious surfaces. For classification purposes, any land within the tract of land for an industrial or commercial site will be classified as such, regardless of the current condition of the land.

Previous residential development – A previous residential development contains houses, condominiums, apartments, etc. and typically retains few natural features beneficial to wildlife. Redeveloping such areas reduces impacts to natural areas that still provide valuable wildlife habitat. For classification purposes, any land within the tract of land for a previous residential development will be classified as such, regardless of the current condition of the land.

Previously dredged area – Previously dredged areas consist of two types: maintenance dredging and naturalized areas. Maintenance dredging applies to routine removal of accumulated sediment. Areas that are repeatedly dredged lack features of surrounding areas that have not been dredged. Naturalized areas have been dredged in the past but with the passage of time have regained some natural features relating to depth, substrate, or vegetation.

Prime farmland – Prime farmland is best suited for agriculture based on its slope, soil type, and wetness and as a result should remain in agriculture and not be developed. <http://www.nc.nrcs.usda.gov/programs/soilsurvey/primefarmland.html>

Priority Habitats – Priority Habitats are terrestrial habitat identified in the North Carolina Wildlife Action Plan as critical for conservation due to the rarity, diversity, threats to or value of the habitat to the conservation of priority wildlife including federal or state listed species.

Pump out service – Service available at marinas to remove contents of waste holding tanks.

Rain barrel / cistern – Rain barrels and cisterns collect and store rainwater running off of rooftops. These containers typically hold from less than 100 gallons to thousands of gallons. Rain barrels and cisterns collect water from gutter downspouts and store it to be used for non-potable purposes such as irrigation and washing equipment. Rain barrels reduce stormwater runoff and the use of potable water for non-potable applications.

Recognized conservation land – Recognized conservation lands include public land owned by federal, state, or local government, land owned by a land trust or conservation organization, private land with a conservation easement, and mitigation land.

Restoration area – An area that will be restored to natural conditions as determined during the Initial Consultation. Restoration areas should also qualify as natural areas.

Retention ponds – See sedimentation basins.

Reused (gray) water – Reused or graywater is wastewater generated from domestic activities such as laundry, dishwashing, and bathing which can be recycled for uses such as irrigation. Reused water can be supplied by municipalities or recycled on site.

Riparian buffer – See riparian zone.

Riparian zone – The riparian zone is the interface between land and water along a stream, river, pond or lake. As the interface between terrestrial and aquatic habitat, riparian zones provide vital wildlife habitat and provide numerous critical functions to protect aquatic systems such as reducing sedimentation and erosion, shading, and supplying woody debris. Riparian zone width is measured horizontally (linear) from the top of the bank. For example, a 100 foot wide buffer is 100 linear feet from the top of both streambanks. Other terms such as riparian buffer or riparian area are synonymous with riparian zones.

Riparian restoration – Replanting an appropriate diversity of native vegetation within riparian zones. While merely allowing riparian areas to revegetate naturally is often appropriate, riparian restoration implies replanting.

Road density – A measure of the length of road within a given area. For the purposes of WFDC, all road widths are considered equally but roads made with permeable materials are not included in road density calculations.

Road network – All of the roads in a given area.

Roadway fill – Soil or rock material placed in an area for the purpose of elevating or leveling the ground surface for the construction of a road.

Rock sills – Rock sills are freestanding rock structures used to protect actively eroding marshes and shorelines. Placing rock sills in water parallel to shore dissipates wave energy.

Sedimentation basins – Sedimentation basins or retention ponds are used to collect water runoff at construction sites. These structures improve water quality because the runoff collects in basins and sediment settles on the bottom. These structures have the potential to provide stormwater runoff and wildlife habitat benefits after construction activities cease.

Shoreline stabilizing structures – Structures such as bulkheads or vertical walls can stabilize shorelines but these artificial structures create unnatural conditions and inhibit natural processes.

Significant Natural Heritage Area (SHNA) – A SNHA is an area of land or water identified by the North Carolina Natural Heritage Program as being important for conserving the State's biodiversity. Sites are classified as national, regional, state, or county significant.

<http://www.ncnhp.org/Pages/siteconservation3.html>

Spanning structures – Spanning structures, for the purposes of WFDC, are bridges or bottomless arch culverts. Spanning structures cross water bodies, such as streams, with less impact than culverts. Spanning structures maintain stream functions and do not inhibit movement of most aquatic or terrestrial organisms.

Steep slopes – For the purposes of WFDC, steep slopes are defined as anything steeper than 30%. For the purposes of WFDC, any area that rises more than 15 feet over a 50 feet horizontal distance is considered to have a slope greater than 30 %.

Stormwater retention pond – Also known as a stormwater pond or settling pond, stormwater retention ponds are often used to slow the flow of stormwater runoff to receiving surface waters. When they are constructed properly, they also allow water to soak into the ground.

Stormwater wetland – Stormwater wetlands are artificial features with wetland plants that can improve water quality and slow the release of stormwater runoff to receiving surface waters.

Stream hydrology – Stream hydrology refers to the flow of surface and groundwater from the surrounding landscape to a stream. Modifications to stream hydrology would affect the delivery or movement of water in a stream.

Stream restoration – Stream restoration activities can improve fish habitat, reduce sediment sources, reconnect streams and floodplains, etc. Restoration often involves heavy machinery and the reconstruction of the stream channel. It goes beyond merely replanting riparian areas.

Subsurface drainage system – A network of basins or inlets on the ground surface that drain into underground pipes to collect stormwater runoff and discharge the water at a single point.

Submerged Aquatic Vegetation (SAV) – SAV beds provide vital wildlife habitat in coastal areas, particularly for juvenile fish and shellfish. SAV beds can reduce shoreline erosion by dissipating wave energy and improve water quality by filtering polluted runoff.

<http://www.ncfisheries.net/habitat/chppSAV.html>

Terrestrial habitat restoration – Terrestrial habitat restoration improves the condition of terrestrial habitats. It may involve returning fire to an ecosystem, removing undesirable vegetation, planting native vegetation, etc.

Unique farmland – Soils that have a special set of properties that are unique for producing certain high-value crops. <http://www.nc.nrcs.usda.gov/programs/soilsurvey/primefarmland.html>

Upland basin – A created water access site requiring no alteration of wetland or estuarine habitat and providing adequate flushing by tidal, wind, or flow generated water circulation.

Wildlife corridors – Wildlife corridors provide habitat and safe passage for wildlife. For the purposes of WFDC, these travel corridors for wildlife must 1) connect two or more natural areas, 2) be sufficiently wide (200' or more) and 3) qualify as natural areas.

Wildlife passages – Wildlife passages allow wildlife to move safely between natural areas that are separated by a manmade obstruction, such as a road, that limits movement between the two areas.

INTERNET LINKS

Green Growth Toolbox

http://www.ncwildlife.org/greengrowth/Conservation_Data.htm

NCDENR surface water classifications <http://portal.ncdenr.org/web/wq/ps/esu/classifications>

Salt Marsh Restoration: Coastal Habitat Enhancement <http://www.ncseagrant.org/home/resource-library/free-information-and-guides?id=32&category=Water+Quality>

Landscaping for Wildlife with Native Plants http://www.ces.ncsu.edu/forestry/pdf/ag/ag636_03.pdf

International Dark Sky Association lighting fixtures and manufacturers

<http://www.darksky.org/mc/page.do?sitePageId=56422&orgId=idsa>

Division of Forest Resources Best Management Practices Manual.

http://www.dfr.state.nc.us/publications/WQ0107/BMP_chapter11.pdf

APPENDIX A – CRITERIA GRAPHS

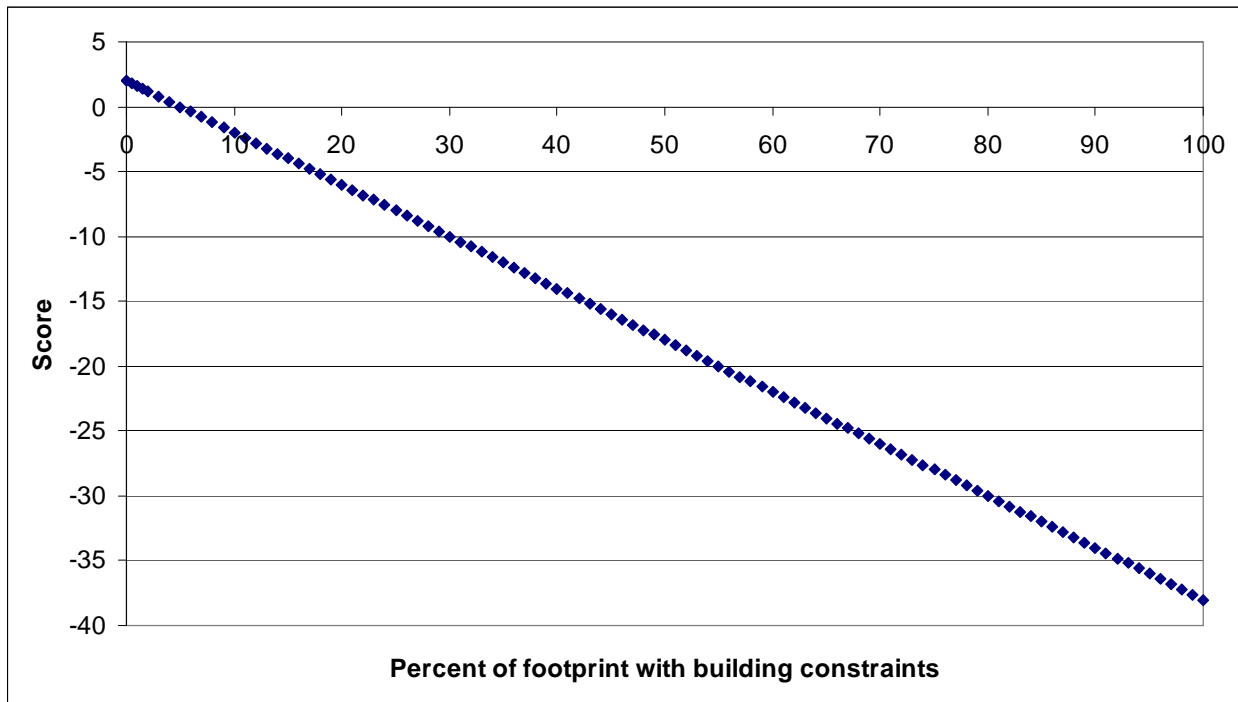


Figure 1. Graph for criterion I. B. 1. showing scores corresponding to the percent of the development footprint that has building areas constraints.

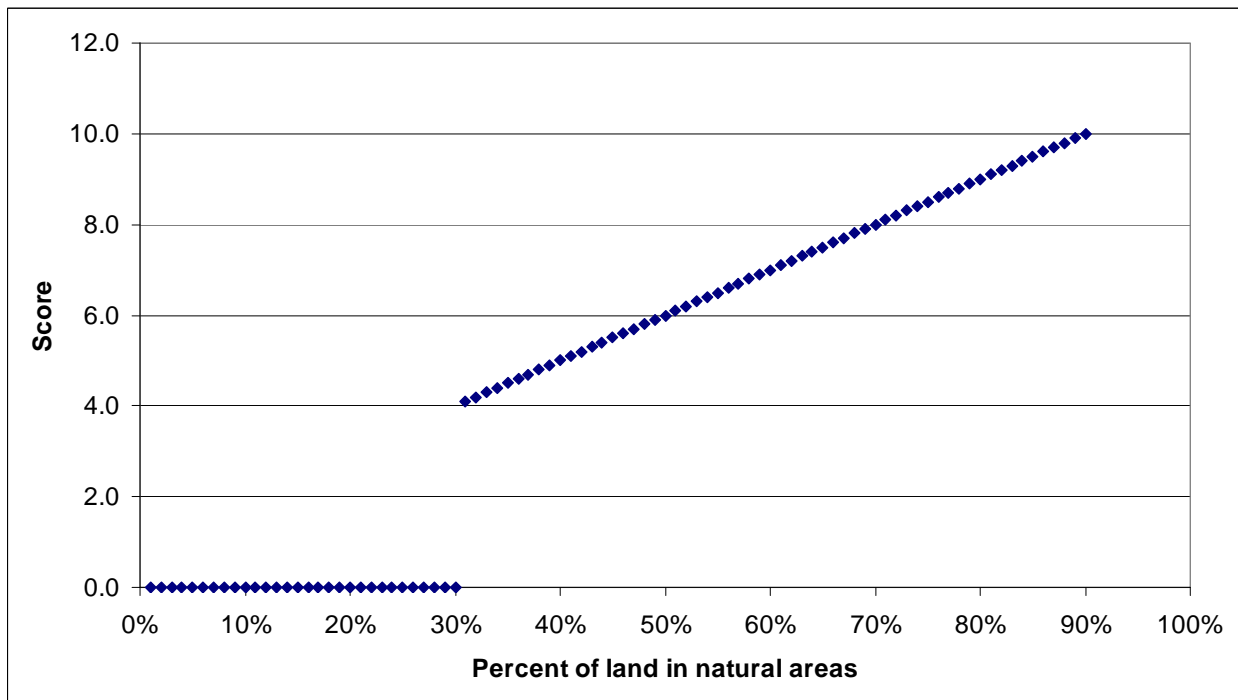


Figure 2. Graph for criterion I. D. 1. showing scores corresponding to the percent of land within the development tract that is conserved as a natural area.

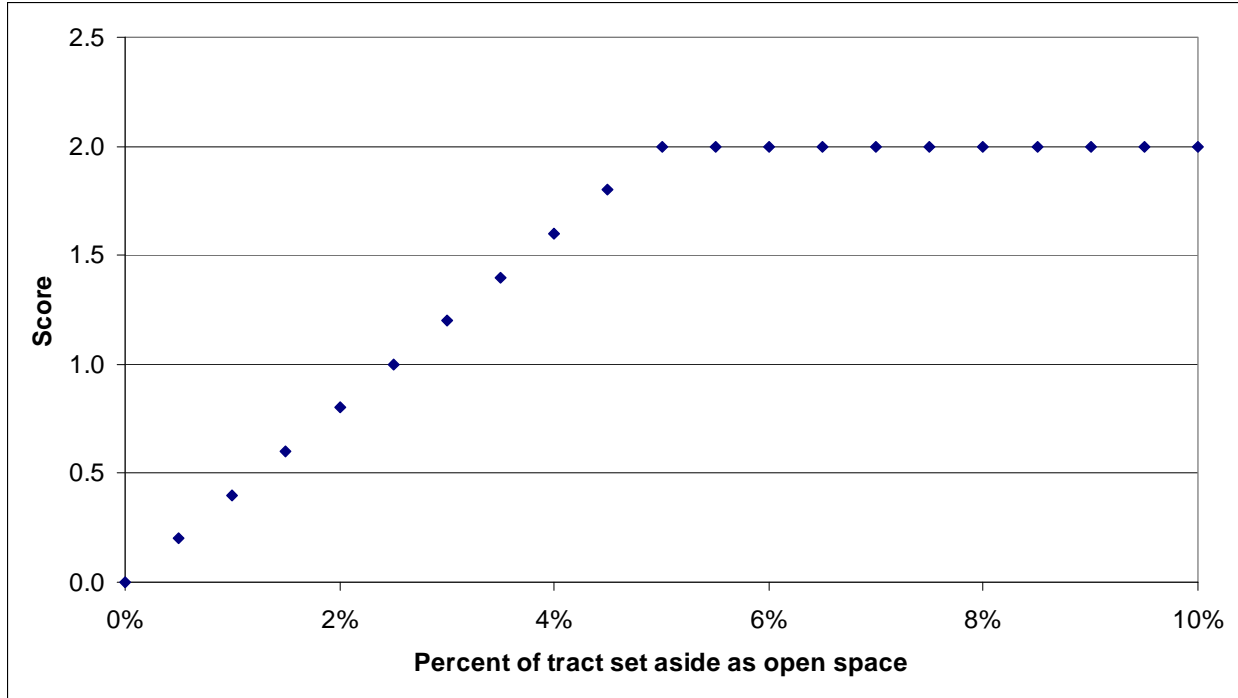


Figure 3. Graph for criterion I. D. 2. showing scores corresponding to the percent of the development tract that is set aside as open space.

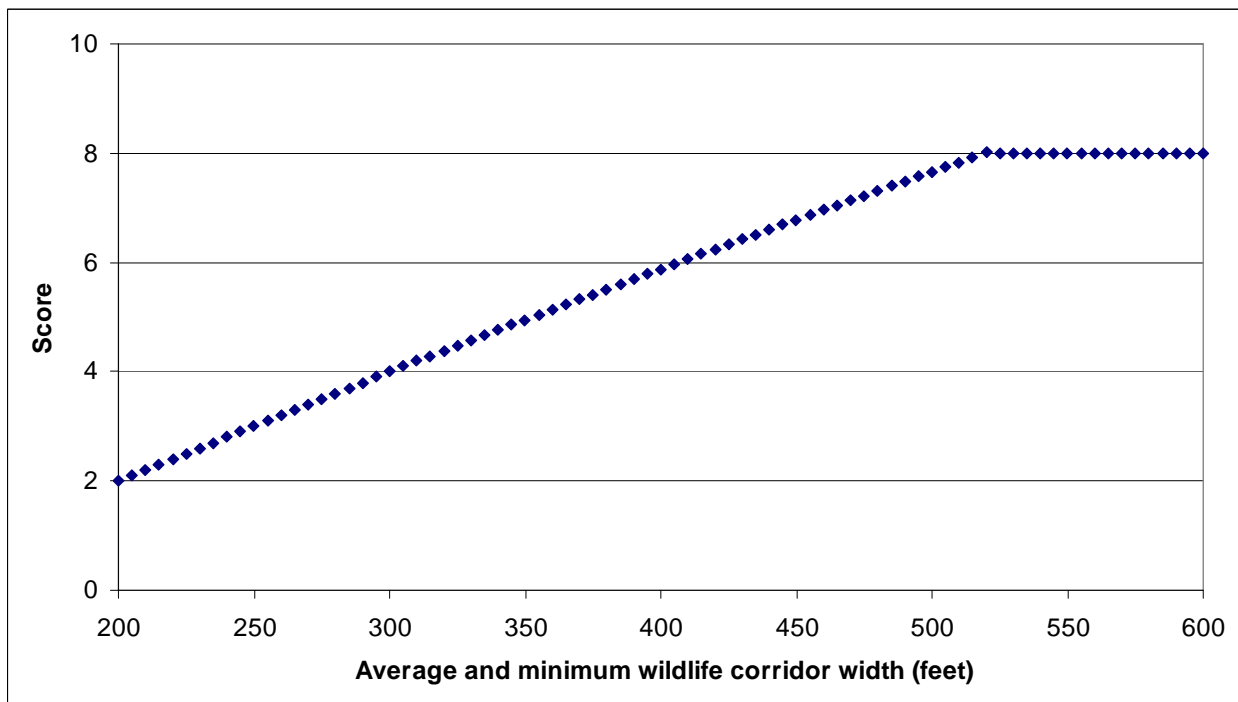


Figure 4. Graph for criterion I. E. 2. showing scores corresponding to the average and minimum wildlife corridor width. The formula is the same for the average width and the minimum width and the score is derived by combining scores from these two formulas.

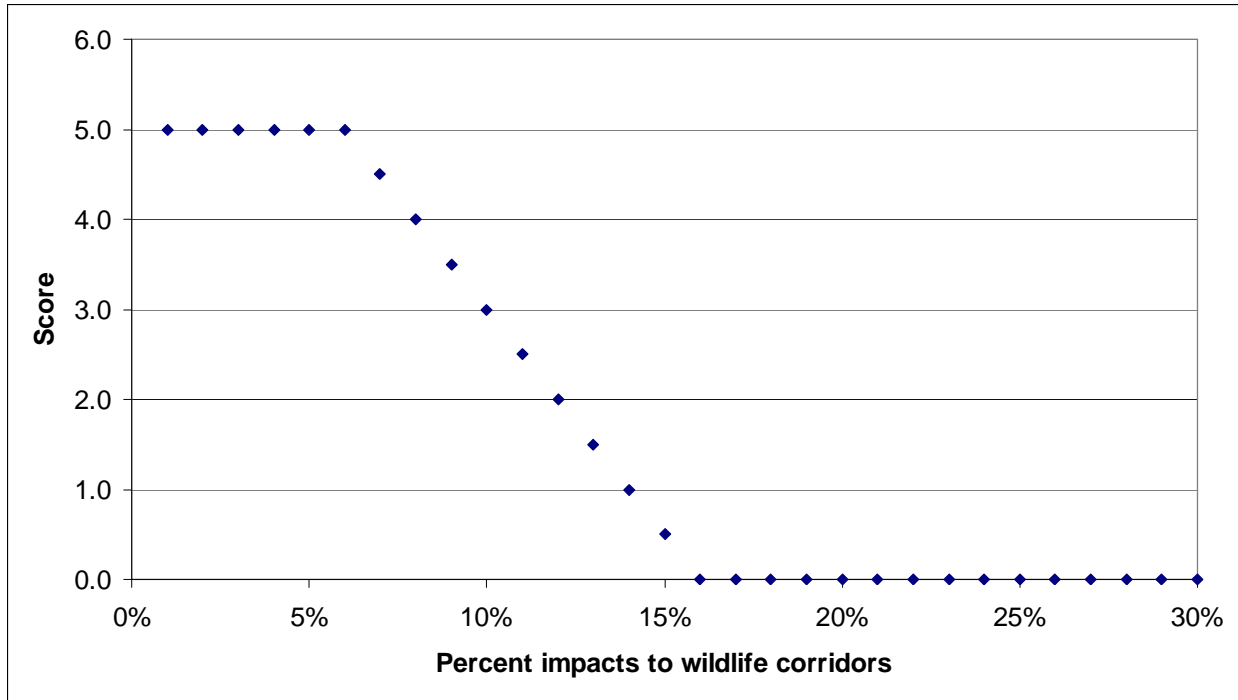


Figure 5. Graph for criterion I. E. 3. showing scores corresponding to the percentage of impacts to wildlife corridors.

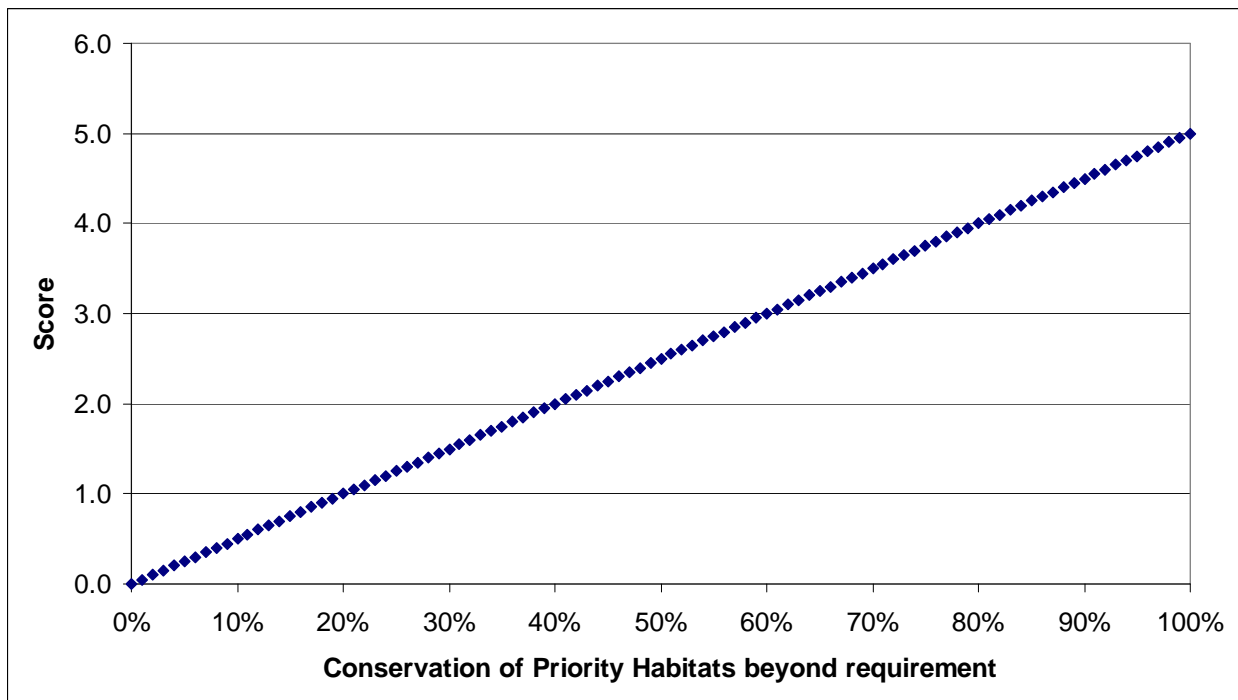


Figure 6. Graph for criterion I. F. 1. showing scores corresponding to the percentage of Priority Habitat that is conserved beyond the required amount.

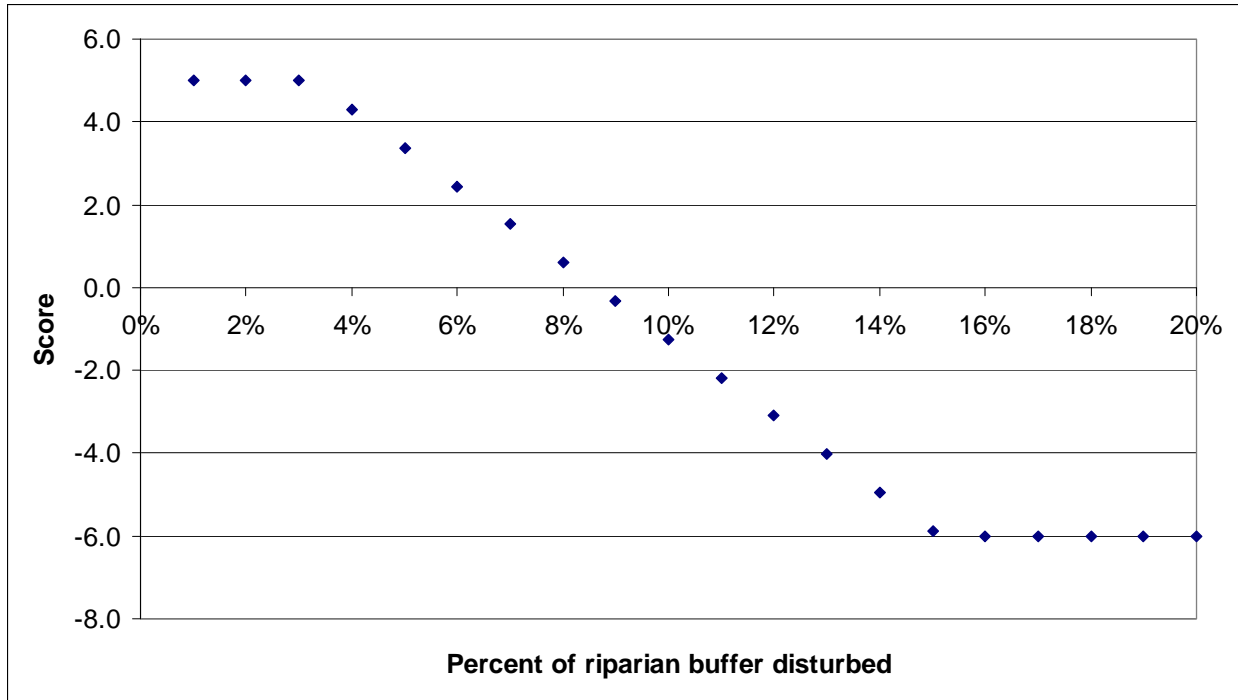


Figure 7. Graph for criterion I. H. 1. showing scores corresponding to the percentage of riparian buffer that is disturbed.

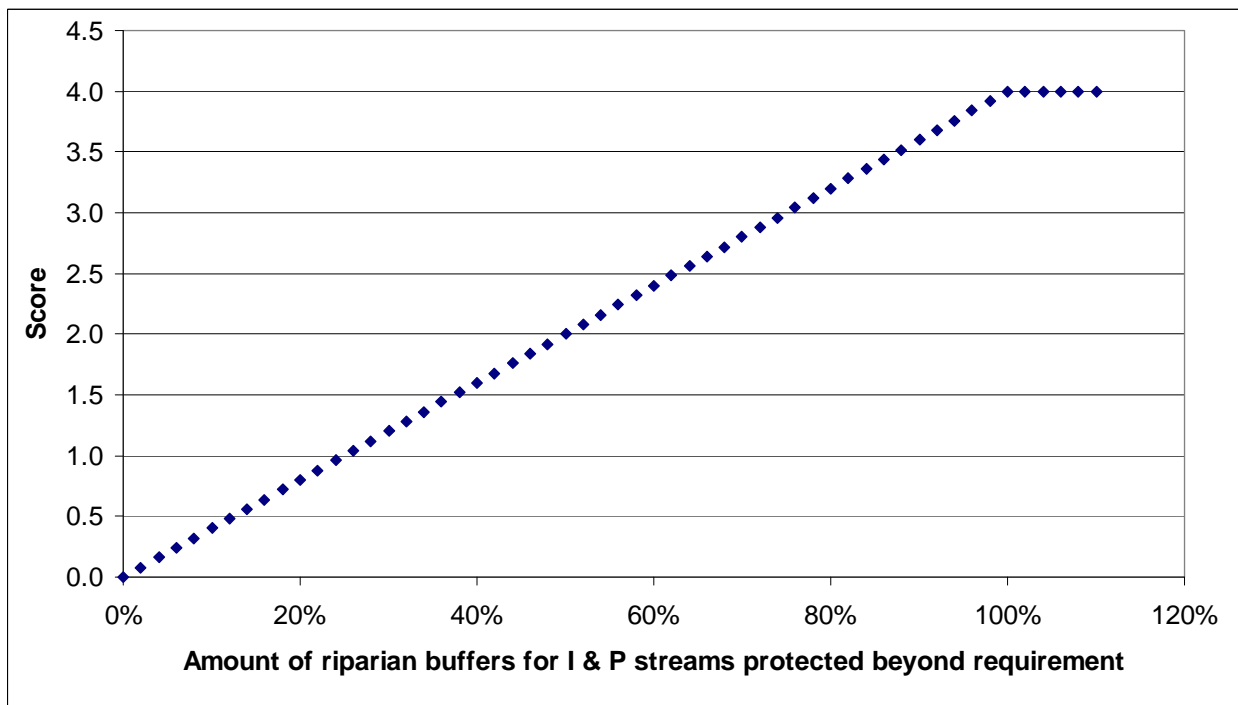


Figure 8. Graph for criterion I. H. 2. showing scores corresponding to the amount of riparian buffer along intermittent and perennial streams that is protected beyond the required amount.

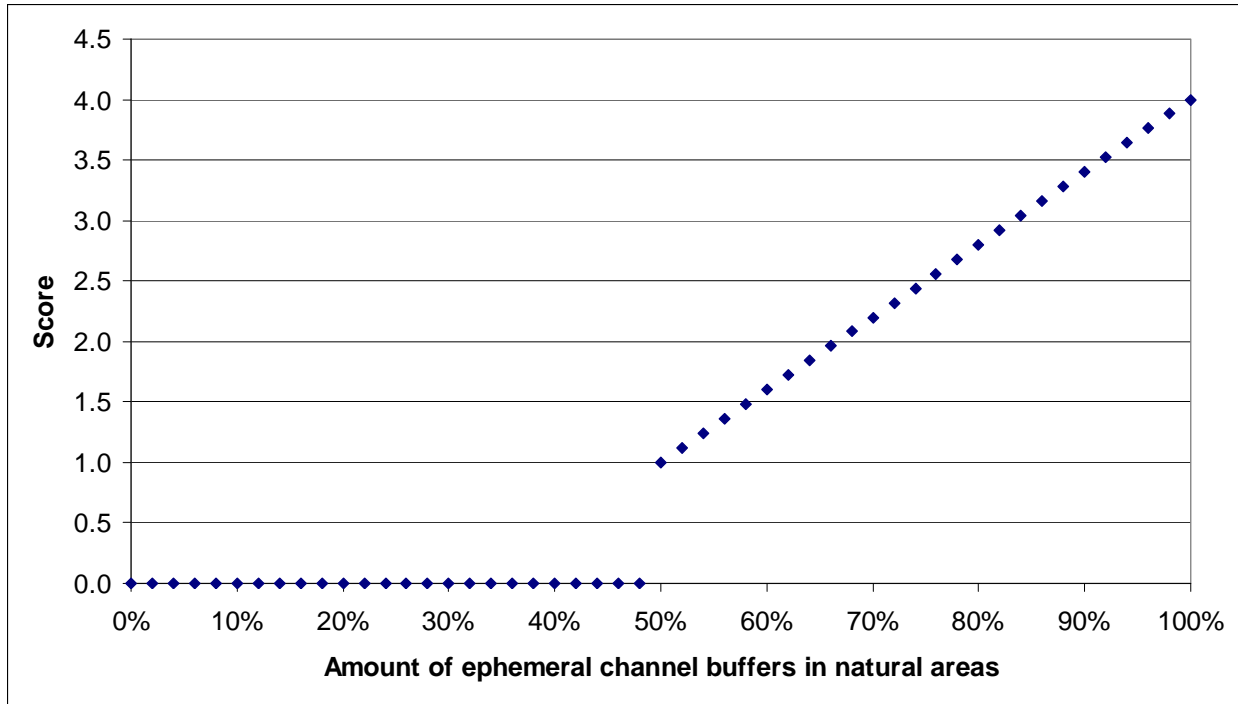


Figure 9. Graph for criterion I. H. 3. showing scores corresponding to the amount of riparian land along ephemeral channels that is conserved as natural areas.

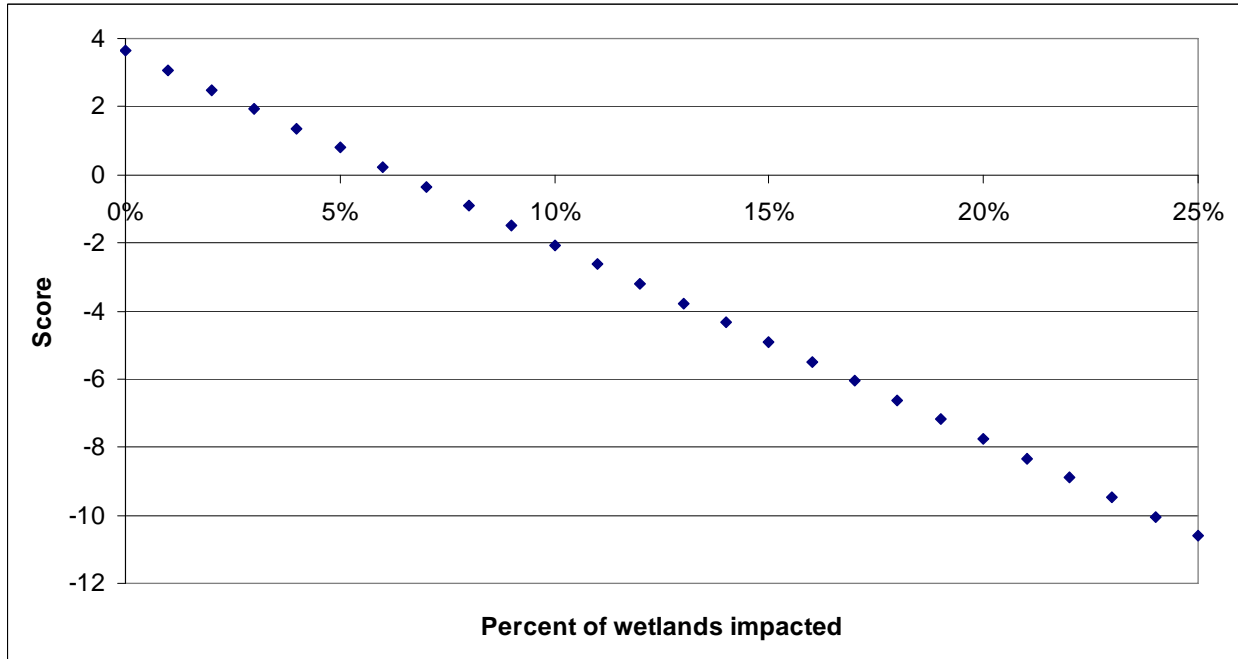


Figure 10. Graph for criterion I. I. 1. showing scores corresponding to the percent of jurisdictional wetlands impacted.

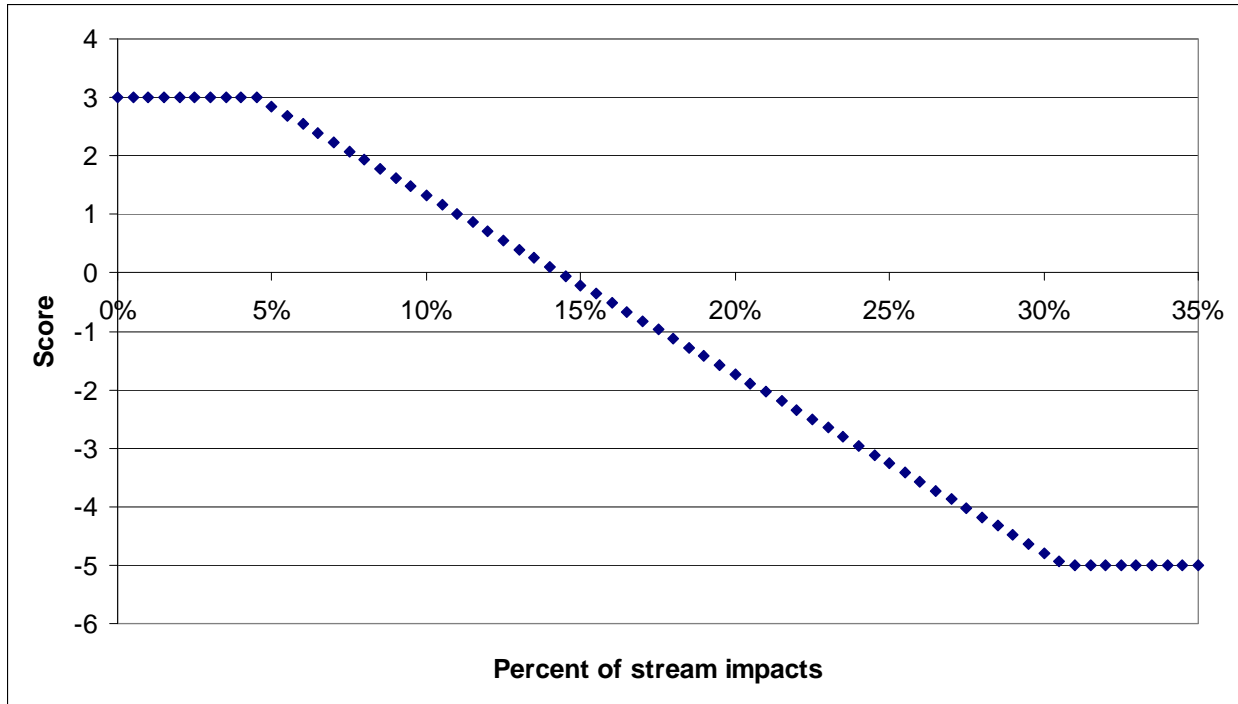


Figure 11. Graph for criterion I. L. 2. showing scores corresponding to the percent of stream impacts.

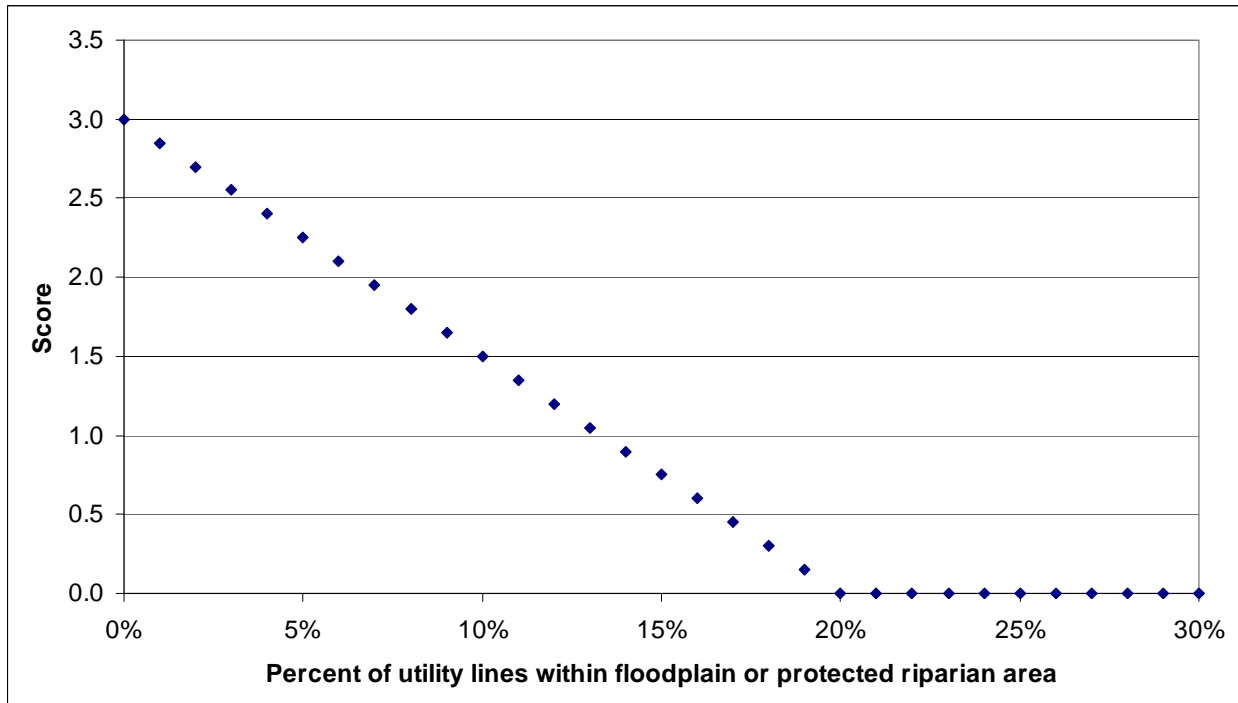


Figure 12. Graph for criterion I. O. 1. showing scores corresponding to the percent of utility lines located within 100 year floodplains or protected riparian zones.

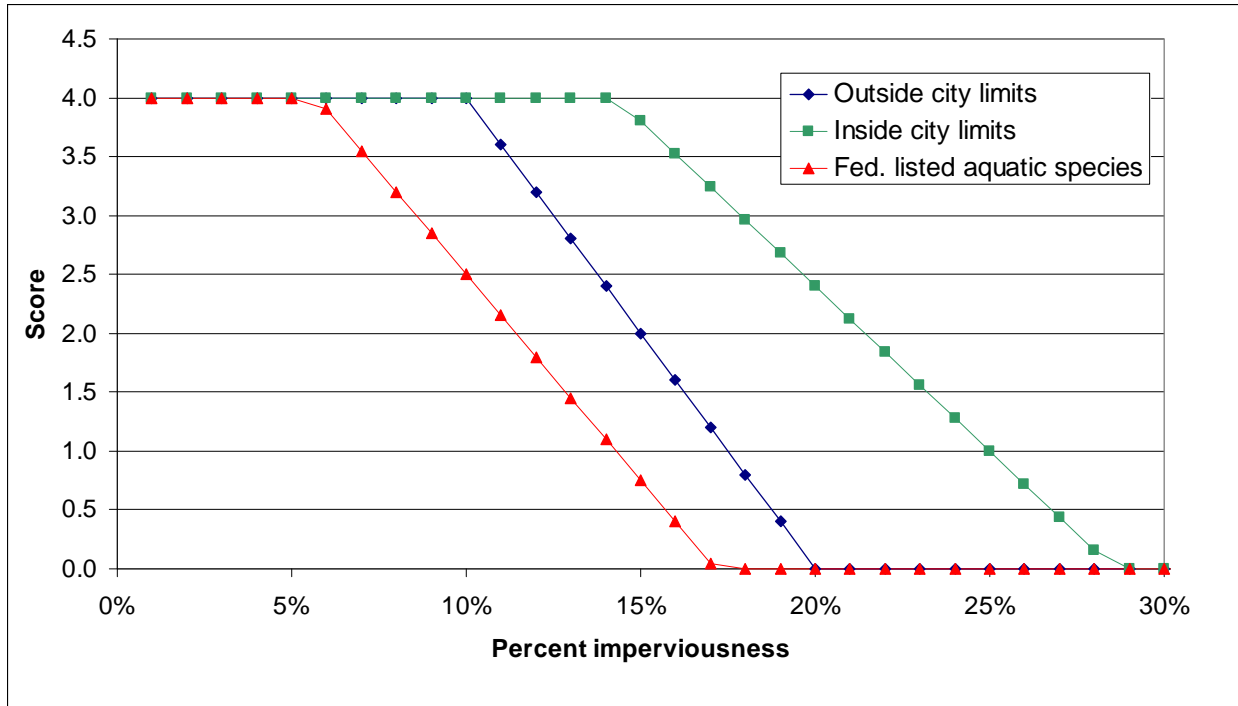


Figure 13. Graph for criterion I. P. 2. showing scores corresponding to the percentage of impervious surfaces for developments inside city limits, outside city limits, and within 14 digit HUCs containing Federally listed aquatic species.

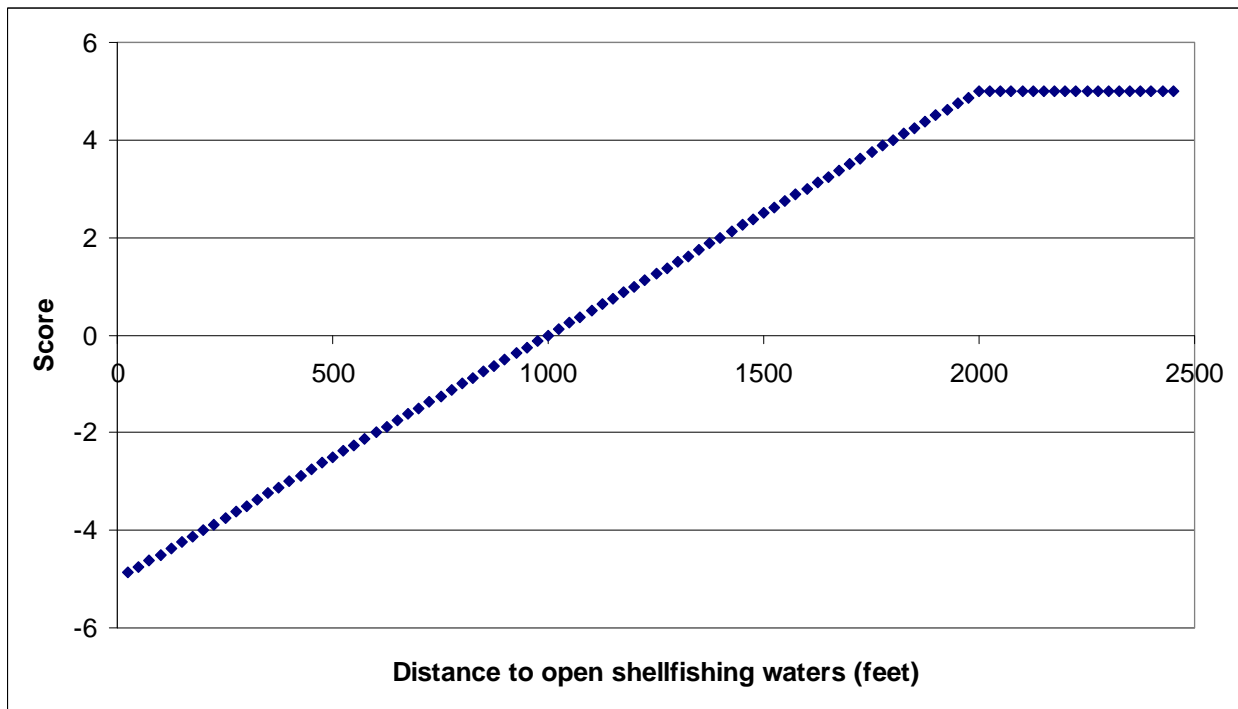


Figure 14. Graph for criterion I. S. 1. showing scores corresponding to the distance from the development tract to open shellfishing waters.

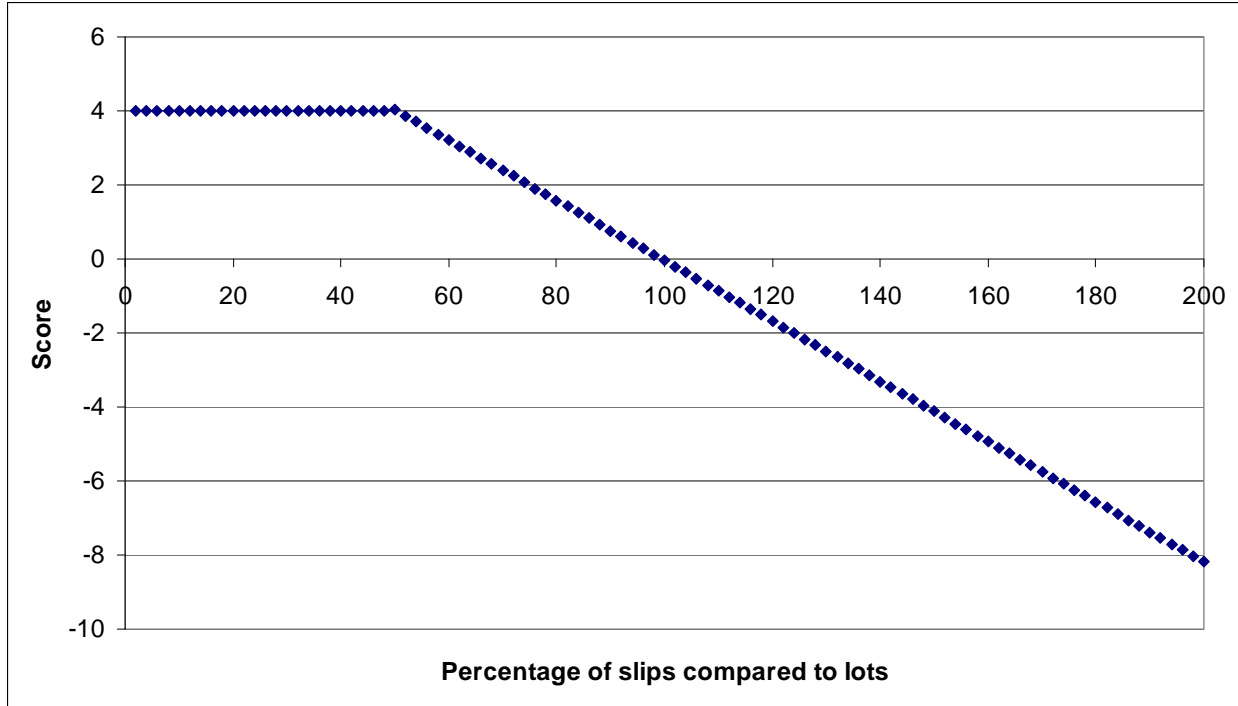


Figure 15. Graph for criterion I. S. 7. showing scores corresponding to the percentage of marina slips compared to individual lots. If there are 1.5 slips for every lot, the percentage is 150 %.

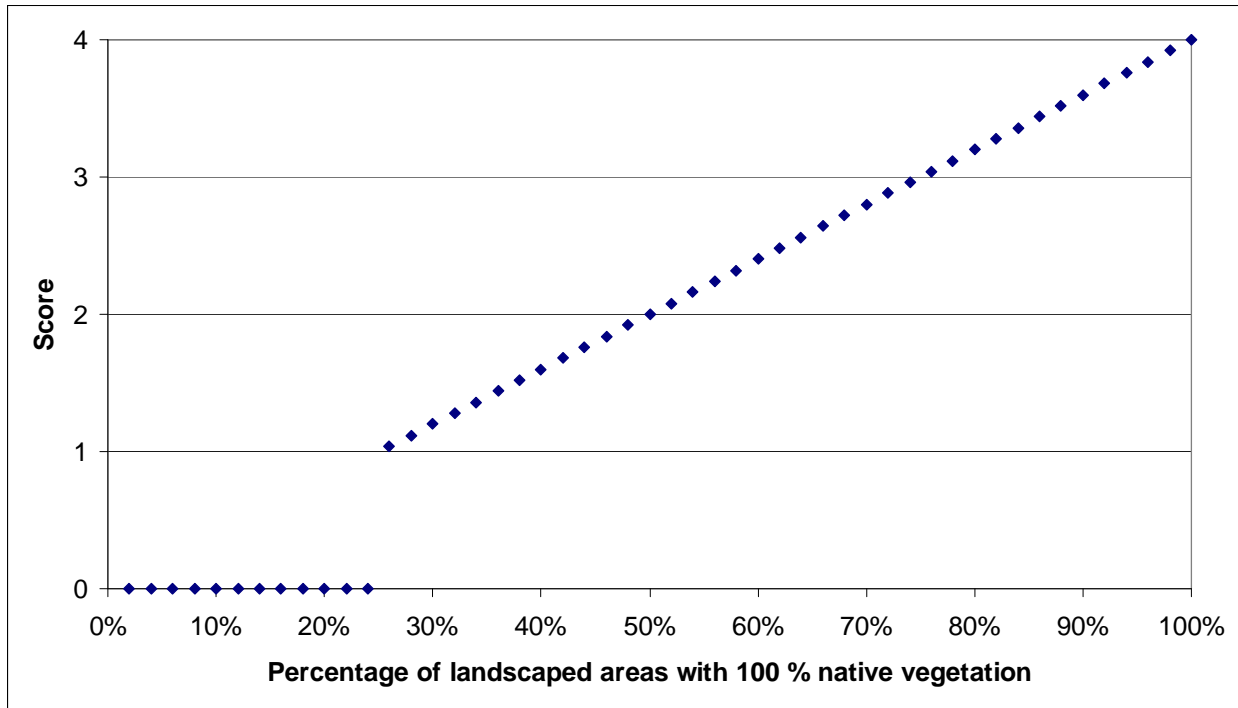


Figure 16. Graph for criterion II. C. 1. showing scores corresponding to the percentage of landscaped areas containing only native vegetation.

APPENDIX B – PRIORITY HABITAT GUIDANCE

The following definitions and guidance describe the Priority Habitats to be identified and delineated during the Terrestrial Habitat Survey. The amount of land to be conserved for various Priority Habitats is also discussed. Descriptions of ideal conditions help the Review Team determine conservation priorities when the amount of Priority Habitat exceeds 40 % of the tract.

Bald Eagle Nests (330 foot or 660 foot core area)

Priority Habitat is the active nest of a bald eagle or pair and an undisturbed 330 foot or 660 foot core area surrounding the nest. The 330 foot core area distance should only apply if all development is *not* visible from the nest. If development is visible from the nest, a 660 foot buffer needs to be conserved in undisturbed habitat. Above all, the buffer distance established must meet the official management guidelines of the USFWS¹.

Barn Owl Nests (50 ft core area)

Priority Habitat is the active nest of a barn owl or pair. The core area must be an undisturbed area with the nest at the center and surrounded by a 50 foot radius.

Beaches and Estuarine Islands

Minimum condition for Priority Habitat classification: Beaches include the open sand beach and the dunes behind them. Estuarine islands include both naturally occurring islands and islands created by dredged materials.

Ideal condition: Upper beach vegetation can include sea rocket, Dixie sandmat, seaside sandmat, and seabeach amaranth. Dune vegetation is characterized by sea oats grass and American beach grass. Exotic vegetation such as beach vitex should be eradicated. Beaches and dunes should not be hardened with structures to prevent beach erosion. Measures should be taken to limit disturbance of nesting birds and sea turtles. Homeowners should be encouraged to keep all pets indoors, not feed pets outside, and secure garbage. These actions help to limit attracting mammalian predators which can exact a heavy toll on bird and turtle nests.

Bottomland Hardwood Forest

Minimum condition for Priority Habitat classification: Bottomland hardwood forest consists of floodplain forests whose canopy is dominated by hardwoods. To qualify as bottomland hardwood forest, one of the natural community types listed below must be on site. See Schafale & Weakley (1990)² for descriptions that will help identify and delineate habitat.

The bottomland hardwood forest habitat includes the following natural community types as defined by Schafale & Weakley (1990):

¹ US Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines. <http://www.fws.gov/migratorybirds/baldeagle.htm>

² Shafale, M.P. and A.S. Weakley. 1990. Classification of the Natural Communities of North Carolina, Third Approximation. North Carolina Natural Heritage Program, Raleigh.

- Coastal plain levee forest
- Cypress-gum swamp
- Coastal plain bottomland hardwoods
- Coastal plain small stream swamp
- Piedmont/mountain levee forest
- Piedmont/mountain swamp forest
- Piedmont/mountain bottomland forest
- Piedmont/low mountain alluvial forest

Caves and Mines (650 ft core area)

Minimum condition for Priority Habitat classification: The presence of a cave or mine, or any sign of cave or mine openings, on site.

Most caves occur in the Mountain Region of western North Carolina, and there is a large variety of cave types. However, the most common types of caves are solution caves, fissure caves, and rock shelter/boulder caves. An extensive mining history in North Carolina has produced numerous subterranean caves across the state that mimic environmental conditions of natural caves. This habitat type does not include open pit mines, strip mines, and quarries. It includes mines that contain subterranean excavations so that the inside of the mine shaft and tunnels resemble cave conditions and are not completely flooded by ground water. Larger mine excavations are likely to provide better habitat than smaller mines. Caves and mines provide habitat for multiple species of federal and state listed bats (Table 2), as well as the longtail salamander.

If caves are being used by NC Wildlife Action Plan bat species on site, they must be gated following recommendations by NCWRC biologists. A core area with a radius of up to 650 feet from the cave or mine can be identified as Priority Habitat.

Table 2. NC Wildlife Action Plan priority bat species and their habitat.

<u>Species</u>	<u>Colonial roost or hibernacula habitat type</u>
Rafinesque's big-eared bat, <i>Corynorhinus rafinesquii</i>	tree cavity or structure
Virginia big-eared bat, <i>Corynorhinus townsendii virginianus</i>	caves or tree cavities
Southeastern myotis, <i>Myotis austroriparius</i>	caves or structures
Gray myotis, <i>Myotis grisescens</i>	caves only
Eastern small-footed myotis, <i>Myotis leibii</i>	caves, rock outcrops, quarry boulders, or artificial structures
Northern long-eared myotis,	caves, structures or tree cavities

Myotis septentrionalis,

Indiana bat, *Myotis sodalis*

caves, structures or trees cavities

Chimney Swift Colonies

Minimum condition for Priority Habitat classification: Surveys should be conducted opportunistically during the Terrestrial Habitat Survey.

Chimney swift roost colonies occur most often in artificial structures. A colony is defined as the area where two or more chimney swifts are observed entering a structure at dusk in the late summer or fall. Where chimney swift colonies are detected, used structures should be maintained where possible. However, if structures that are being used must be torn down, the applicant is required to replace them following the best available guidelines. No buffer is needed around structures that provide habitat.

Colonial Waterbird Nesting Colonies (330 foot core area)

A waterbird nesting colony is defined as an area where 2 or more colonial waterbirds are nesting. The habitat must include a 330 foot undisturbed core area that surrounds the entire colony^{3,4}. A core area with a radius of up to 330 feet from the nesting colony can be identified as Priority Habitat.

Core Area

Core areas surrounding Priority Habitat types are considered to be essential components of the Priority Habitats. The acreage of core areas is calculated using a radius extending outward from the edge of the Priority Habitat. If the Priority Habitat is a nest, the core area will be a circle extending outward from the nest. For other types of Priority Habitat, the shape will vary. Land within the core area that is not considered quality habitat should be set aside and restored per discussions with the Review Team.

High Elevation Habitats

Minimum condition for Priority Habitat classification: Forests above 3500 ft in elevation that meet the definition of one of the following community types defined in Schafale & Weakley (1990): Fraser-fir forest, red spruce-fraser fir forest, high elevation red oak forest, northern hardwood forest, and boulderfield forest.

Habitat description: High elevation habitats are natural communities generally found on high elevation sites in western North Carolina. High elevation habitats include spruce-fir and northern hardwood communities. Spruce-fir forests occur on high mountaintops, and are often comprised of northern hardwood mixed with red spruce at elevations from about 4,500 feet to 5,500 feet. Above 6,000 feet, Fraser fir typically becomes dominant.

Spruce-fir communities provide critical breeding habitat for many species of conservation concern, such as the federally endangered Northern Flying Squirrel and many breeding land

³ Rogers, J.A., and H.T. Smith. 1995. Set-back distances to protect nesting bird colonies from human disturbance in Florida. *Conservation Biology* 9(1):89-99.

⁴ Carney, K. M. and W.J. Sydeman. 1999. A Review of Human Disturbance Effects on Nesting Colonial Waterbirds. *Waterbirds: The International Journal of Waterbird Biology* 22:(1) 68-79.

birds. Spruce-fir forests are also listed as the second most endangered ecosystem in the United States. Due to their rarity, conservation of spruce-fir communities (Fraser-fir forest and red spruce-fraser fir forest) should be prioritized above northern hardwood-dominated areas.

Northern hardwood forests are quite variable and difficult to define. They are typically found on high elevation sites above 4,000 feet. Components of spruce-fir habitats are present in sub-dominant numbers within northern hardwood communities. Northern hardwoods grade to cove hardwoods. Northern hardwoods provide habitat for many of the same species that rely on spruce-fir forests, so conservation of the northern hardwood communities is also very important for the future of these species.

Longleaf Pine Forest

Minimum condition for Priority Habitat classification: 20% of the tree canopy consists of longleaf pine trees, regardless of age, within a stand at least 10 acres in size. To be considered a Priority Habitat, there must be at least 10 contiguous acres of longleaf pine forest. These 10 acres can occur solely on the development tract or only a portion of the 10 acres can occur within the development tract.

Ideal condition: An open canopy (40-70 square feet of basal area per acre) dominated by longleaf pine, with little midstory, and lush and diverse groundcover of grasses and wildflowers. This habitat structure is necessary to support priority species associated with longleaf pine, including Bachman's sparrow, red-cockaded woodpecker, pine snake, and others. Restoration to this condition may require active management, including thinning overstory trees, reducing midstory trees through mechanical or chemical means or controlled burning, and planting grasses and forbs if necessary. Maintenance of this condition also requires active management and is best achieved through controlled burning, though open "park-like" condition can be maintained by mechanical (e.g., mowing) or chemical means as well. Pine straw raking will generally be discouraged, but may be considered in certain circumstances to meet management objectives.

Maritime Forest

Minimum condition for Priority Habitat classification: Maritime forests and shrublands are found on the NC coast on stabilized upper dunes and flats protected from salt water flooding and the most extreme salt spray. This habitat includes maritime evergreen forest, maritime deciduous forest, maritime shrub, coastal fringe evergreen forest, and coastal fringe sandhill natural communities. Canopies of maritime forests can be dominated by live oak, sand laurel oak, loblolly pine, beech, American holly or hickory. The understory is often dominated by dense shrubs and vines. Any forests or shrublands along the coast or islands meeting this description will be considered maritime forest.

Ideal condition: The extent of maritime forest has been greatly reduced by coastal development, and this is now one of the rarest and most imperiled habitat types in North Carolina. These forests should be managed for dense canopies of native tree species. Exotic species should be controlled, but cutting of native trees should be avoided. Controlled burning can be beneficial.

Mature Hardwood Forest

Minimum condition for habitat survey: For the purposes of the WFDC program, we will consider a forest to be “mature hardwood” if there are at least 20 contiguous acres (on or off the tract) with >25% of trees consisting of hardwoods >50 years old. If the age of the stand is not known, look for hardwoods >20 inches diameter to indicate “mature” trees (this will vary depending upon tree species and growing conditions).

Ideal condition: Mature hardwood includes a variety of forest types with a hardwood component, and can be found on a wide range of soil types and elevations. While different types of hardwood forests will differ in what they look like and how they should be managed, the generalized ideal condition for this habitat type is a mixed age stand with a diverse canopy that includes mast-producing hardwoods (e.g., oaks and hickories), a well developed midstory, a diversity of grasses and forbs, periodic canopy gaps which promote dense understory growth, and standing and fallen dead trees. These “old growth” forest conditions are increasingly rare in NC, particularly in the Piedmont and Coastal Plain. As forests mature, regeneration of mast producing species are favored over faster growing trees. As canopy trees mature and die, snags are created which provide nesting and roosting habitat for a wide variety of mammals, birds, and reptiles. When the snags fall, the downed trees provide valuable cover for reptiles, amphibians, small mammals, invertebrates, and some birds.

Several wildlife species that use this habitat require larger tracts of contiguous forest, and thus forest patch size and connectivity to adjacent forests should be maximized for this habitat to the greatest extent possible. Active management can enhance these conditions, with the use of controlled burning favored for many forest types. However, mechanical means can be used to create canopy gaps and snags and favor mast-producing trees.

Rock Outcrops

Minimum condition for habitat survey: All properties should be surveyed for the presence of rock outcrops.

Rock outcrops are natural features that contribute to a natural community structure consistent with physical characteristics of the underlying geological unit. The NC Wildlife Action Plan lists two types of rock outcrops: high elevation rock outcrops and low elevation cliffs/rock outcrops. For the purposes of this program, rock outcrops include any of the following natural communities described in Schafale & Weakley (1990):

- High and low elevation rocky summit
- High and low elevation granitic dome
- Montane, Piedmont, and Coastal Plain acidic and mafic cliffs
- Montane and Piedmont mafic and calcareous cliffs
- Coastal Plain marl outcrops
- Granitic flatrocks
- High elevation mafic glade
- Diabase glade
- Ultramafic outcrop barren
- Boulderfield forests

In addition, rock outcrops that are dispersed throughout other forest types (such as small boulderfields) count as rock outcrops. Rocks deposited by past human activities (including old foundations, stone walls, and agricultural rock piles) are not considered Priority Habitat.

Priority snake species need the greatest acreage of rock outcrop habitat. The habitat that rock outcrops provide changes over time due to available sunlight from tree canopy gaps, which snakes need to thermoregulate. Therefore surrounding protected habitat should be as wide as possible and should be defined by the biologist conducting the Terrestrial Habitat Survey. In the Blue Ridge Ecoregion and the western Piedmont, the surrounding protected habitat should be 650 feet wide and rock outcrops should be connected, especially if a NC Wildlife Action Plan species that uses rock outcrops is found or is known to occur on the site. Appropriate habitat that is equivalent in size to an area with a radius of 650 feet surrounding the rock outcrop can be identified as Priority Habitat. The shape of this Priority Habitat surrounding the rock outcrop can vary and should include high quality habitat.

Surrounding Protected Habitat

Two Priority Habitats, rock outcrops and wetland habitats, have surrounding protected habitat components. For these Priority Habitats, surrounding protected habitat differs from core areas in that 1) surrounding protected habitats only includes quality habitat and 2) the shape of the surrounding protected habitat is variable. Whereas core areas extend a fixed distance around the entire Priority Habitat, the width of surrounding protected habitat varies. For calculation purposes, the size of the surrounding protected habitat that can be identified as Priority Habitat is determined using a radius distance from the edge of the Priority Habitat. This radius represents an average distance of the surrounding protected habitat from the edge of the Priority Habitat. The Review Team will identify areas surrounding the protected habitat that are most important to protect. The shape of this surrounding protected habitat will vary.

Tree or Structural Bat Roosts (164 foot core area)

This habitat is defined by the detection of bat signs and the presence of a NC Wildlife Action Plan priority bat species maternity colony, roost or hibernacula in trees or structures not including caves, mines or rock outcrops. The presence of priority bat species is defined as one or more bats being in the process of gestating, raising young, roosting or hibernating. Signs of bat activity include the presence of bat guano on the substrate of the site or the presence of any bat species at a site.

Minimum condition for habitat survey: Surveys for this habitat will be opportunistic. Surveying biologists should examine trees and artificial structures for species listed in Table 2 or for bat signs.

If a NC Wildlife Action Plan priority bat species is found using a feature on the site, the roost tree or structure and the core area must be set aside. In addition, when a priority bat species is found on site and the species uses rock outcrops, caves or mines, surveys should be conducted for these species. If found, the Priority Habitats will be a priority for conservation as defined under their respective definitions. Efforts must be made to identify, cluster, conserve and buffer potential tree or structural roosts if a NC Wildlife Action Plan species is found because bats often change roosts.

If signs of recent bat activity are found, biologists must determine if NC Wildlife Action Plan bat species are using any roosts on site by walking the forest at dark and observing emergence from trees or structures. If bats are observed in or emerging from roosts, live-trapping at the roost exit may be necessary to identify the species.

The core area set aside should also include sufficient distance to prevent all artificial light from illuminating the roost opening. Bat populations are reduced dramatically when exposed to light⁵.

If NC Wildlife Action Plan priority bat species using artificial structures are detected, the structure must be conserved or a replacement must be constructed. Any replacement structure must meet the needs of the species, and must be large enough to house the same number of bats as those found in the original structure. Constructed bat structures must follow effective designs⁶. An area with a radius of up to 164 feet from the bat roost can be identified as Priority Habitat.

Wetland Habitats (150 foot core area)

Minimum condition for habitat survey: All properties should be surveyed for wetlands. Priority wetland habitats include jurisdictional and non-jurisdictional wetlands of the following types defined in Schafale and Weakley (1990): swamp forest bog complex, southern Appalachian bog, southern Appalachian fen, hillside seepage bog, high elevation seep and meadow bogs, upland pool, upland depression swamp forest, low elevation seep, vernal pools, cypress savanna, small depression ponds, beaver ponds (Piedmont / Mountain semi-permanent impoundment), small depression pocosin, interdune ponds, clay-based Carolina bays and limesink depressions. The survey biologist will define wetlands that qualify as Priority Habitats.

Jurisdictional wetlands can be filled as allowed by the criteria. However the core area must be conserved adjacent to non-filled areas according to the definition below if the wetland is classified as a Priority Habitat.

Non-jurisdictional wetlands:

Non-jurisdictional wetlands that are considered Priority Habitats by the Review team must be conserved. The US Army Corps of Engineers' current federal definition of jurisdictional wetlands is as follows: "Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

This definition can also apply to non-jurisdictional wetlands. Therefore, for the purposes of this program, a non-jurisdictional wetland is defined as a wetland that does not require a permit under Section 404 of the Clean Water Act. Non-jurisdictional wetlands are mostly 'isolated wetlands,' or wetlands with no surface drainage connection to other waters.

⁵ Laidlaw, J. W. J. and M. B. Fenton. 1971. Control of nursery colony populations of bats by artificial light. The Journal of Wildlife Management, 35: (4) 843-846.

⁶ Bat Conservation International. Criteria for Successful Bat Houses.
<http://www.batcon.org/pdfs/bathouses/bathousecriteria.pdf>

Ephemeral wetlands:

Many ephemeral wetlands are not flooded year-round and may be dry when encountered. When found to be dry, classification of a ephemeral wetland should document:

- 1) the presence of a depression with evidence of stained leaves and water marks and,
- 2) the presence of fingernail or pea clams (Pisidiidae), amphibious air-breathing snails (Basommatophora), or caddisfly larvae casings (Trichoptera), or
- 3) at least one wetland plant species^{7,8}.

When a wetland that qualifies as Priority Habitat is found, the following areas must be conserved around the wetland boundaries: 1) An undisturbed pool envelope of 150 feet in width must be conserved around any qualifying wetland and 2) The 600 foot wide surrounding protected habitat must be contiguous and connected with the pool envelope, such that the average total width of the conserved area is 750 feet.^{9,10,11} Appropriate surrounding protected habitat that is equivalent in size to an area with a radius of 750 feet from the wetland can be identified as Priority Habitat. The shape of this Priority Habitat surrounding the wetland and pool envelope can vary and should include high quality habitat.

⁷ The Vernal Pool Association. 2008. Documenting Evidence for Certification of a Dry Pool. Website accessed on 12/2/08, http://www.vernalpool.org/macert_6.htm

⁸ Tiner, R. W. 1999. Wetland Indicators: A Guide to Wetland Identification, Delineation, and Mapping. CRC Press, Boca Raton, FL.

⁹ Semlitsch, R.D. and J. R. Bodie. 2003. Criteria for Buffer Zones around Wetlands and Riparian Habitats for Amphibians and Reptiles. *Conservation Biology* 17, 1219-1228(2003).

¹⁰ Calhoun, A.J.K., N.A. Miller, and M.W.Klemens. 2005. Conserving pool-breeding amphibians in human-dominated landscapes through local implementation of Best Development Practices. *Wetlands Ecology and Management* 13, 291-304(2005).

¹¹ Baldwin, R.F., A.J.K. Calhoun and P.G.deMaynadier. 2006. Conservation Planning for Amphibian Species with Complex Habitat Requirements: A Case Study Using Movements and Habitat Selection of the Wood Frog *Rana Sylvatica*. *Journal of Herpetology* 40, 442-453(2006).