District of Columbia

Wildlife Action Plan

2006

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of the Environment
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Acknowledgments

The District of Columbia's Fisheries and Wildlife Division would like to acknowledge and thank all of the individuals, groups, agencies and organizations that contributed to the development and writing of the District of Columbia's Wildlife Action Plan (WAP).

The Internal Group, composed of key staff from the District's Fisheries and Wildlife Division, included Basil Buchanan, Michael Kaspar, Dhananjaya Katju, Ira Palmer, Mary Pfaffko, Jon Siemien, and Sylvia Whitworth. In addition to being very small, the Fisheries and Wildlife Division has only been officially managing the District's wildlife resources for less than five years. In this short period of time, the staff has learned a tremendous amount about the District's wildlife resources, which has helped in the development of this WAP. The staff's dedication and hard work has made the difference in what seemed like an enormous task for such a young organization as the Fisheries and Wildlife Division. My deep appreciation and thanks goes out for a job well done.

Special thanks go to Mary Pfaffko, a Wildlife Biologist with the District's Fisheries and Wildlife Division, who did a yeoman's work in leading the effort to write the WAP and even more for her unswerving spirit that helped the Internal Group keep focused and on task.

The Working Group, composed of District and federal agencies, conservation organizations and other interested parties, was essential in the development of the District's WAP and the future of the District's wildlife resources. The members of the Working Group were committed to meeting faithfully on a bi-weekly basis for nearly a year. Their wealth of knowledge in the area of wildlife biology and ecology, along with their expertise and experience with the District's flora and fauna was invaluable. The Working Group included: Scott Bates, Shawn Carter, Ken Ferebee, Marcus Koenen, James Rosenstock, and Susan Rudy, National Capital Region, National Park Service; Deanna Dawson, Richard Hammerschlag, and Mary Paul, Patuxent Wildlife Research Center, US Geological Survey; Dan Murphy, US Fish and Wildlife Service; Susan Greeley, US National Arboretum, US Department of Agriculture; Doug Samson, the Nature Conservancy; Dave Curson, Maryland-DC Chapter, National Audubon Society; and Jeff Lerner, Defenders of Wildlife.

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Executive Summary

The District of Columbia is unique in so many ways. It is the nation's capital and the only totally urban jurisdiction in the country required by federal law to manage its fisheries and wildlife resources. Management of fisheries and wildlife resources is usually a state function. However, not being part of another state, the District must function as a state in this regard. In the District government, the Fisheries and Wildlife Division is the responsible entity for managing wildlife.

The mission of the DC Fisheries and Wildlife Division (the Division) is to determine the status of the fisheries and wildlife resources found within the District, ascertain how they interact, and actively manage the resources so that they can endure, through protection, conservation and education. The vision of the Division is to fully maximize the functioning of the terrestrial and aquatic ecosystems within the District through adaptive management based on sound research. The Division works to understand the interrelationships of the local wildlife and humans in the urban environment. These resources consist of both resident species, which complete their life cycles within the District, and migratory species, which spend only a part of their life within the District's jurisdiction.

The DC Fisheries and Wildlife Division takes great pride in the fact that it is one of the 56 jurisdictions required to complete a Wildlife Action Plan (WAP). The Division definitely sees itself as the new kid on the block in the area of wildlife management, only formally managing the District's wildlife resources for about five years. We know we have much to learn regarding wildlife management and how to apply it to a small land area that is predominantly urban.

It has been only through the State Wildlife Grants (SWG) Program that the District has been able to even begin to implement a comprehensive survey for wildlife. Using SWG Program funds appropriated to the District, the Division is now in the fourth year of a citywide bird survey that includes both the resident and migratory species. The SWG Program has also enabled the Division to implement the first-ever comprehensive citywide survey of mammals, reptiles, amphibians and invertebrates.

Through the development of the District's WAP document, the DC Fisheries and Wildlife Division has gathered a wealth of information about the District's wildlife resources. Although we have learned a lot about the wildlife in the District, it is very clear that there is so much more we need to learn. While the District is a very small geographic area, only 69 square miles, a tremendous amount of preliminary information that tells us that the District is home to over 500 species of birds, fish, mammals, reptiles and amphibians. Furthermore, it is too early to even estimate a number for invertebrates, for which we have only scratched the surface on what we believe to be in the thousands. While all of these species of wildlife in the District need some degree of conservation, for the purpose of this WAP, we have focused on those of greatest conservation need.

Introduction

This introduction provides the background, purpose and scope of the WAP for the District of Columbia. It describes the goals, approach, value, legislative mandate and guidance, background on the DC Fisheries and Wildlife Division, problem and need, threats to wildlife in the District, existing conservation legislation in the District, and the list of partners that contributed to the development of this WAP.

Goals, Approach & Value

Goals include:

o Identifying species of greatest conservation need and their habitats in order to develop and implement conservation actions targeted to those species
o Improving the understanding of species in order to enhance the ability to make management decisions
o Conserving and enhancing priority habitats
o Fostering partnerships among conservation agencies and organizations
o Generating interest and participation in wildlife conservation among the general public, students, and youth through education and outreach
o Strengthening existing conservation actions and regulations

In accomplishing these goals, the DC Fisheries and Wildlife Division staff uses this **approach**:

o Use the best information available to identify species of greatest conservation need and their priority habitats
o Protect species of greatest conservation need by conserving their habitats
o Identify critical knowledge gaps and future data needs as well as identify the agencies and organizations most capable of helping fill those gaps and needs
o Address the local concerns that affect the larger surrounding region with which the District shares habitats and migratory paths
o Monitor progress and revise the Plan to account for changing conservation needs over time
o Develop invaluable partnerships that combine the expertise of the District's most experienced land managers with the concerns of environmental groups and the interest of the District's residents

The **value** of this Plan includes, but is not limited to:

o Developing the first nationwide effort for wildlife conservation
o Developing a District-wide conservation plan which incorporates the expertise of all conservation agencies and organizations as well as the public
o Saving species from becoming endangered

o Saving tax dollars from being used to restore populations of species listed by the Endangered Species Act
o Ensure implementation of the WAP for at least 10 years by matching federal funds
o Protecting species that have not traditionally received federal funds, such as non-game wildlife species
o Providing new guidance to conservation agencies in implementing the most efficient technologies and allocating manpower, funds and other resources
o Providing new ways for nongovernmental conservation organizations to collaborate with governmental agencies and affect conservation policy
o Growing interest and participation in conservation among the District's residents and youth
o Fostering an environment that flourishes with fish and wildlife for nature enthusiasts, such as birdwatchers, boaters and fishermen
o Bringing together conservationists across the country as partners in protecting the nation's natural treasures

Legislative Mandate and Guidance

Financial support at the District level for wildlife conservation is critical, but conservation governance at the national level is also necessary. In 2001, Congress addressed this need and developed new conservation funding legislation called:

o Wildlife Conservation and Restoration Program, and
o State Wildlife Grants (SWG) Program.

The Wildlife Conservation and Restoration Program was created by the Commerce, Justice and State Appropriations Act of FY 2001, Title IX, Public Law 106-553. This act provided one year of appropriations for fish and wildlife conservation for the development of the WAP for all states and the District of Columbia.

The State Wildlife Grants (SWG) Program was created by the Department of the Interior and Related Agencies Appropriations Act of 2002, Title I, Public Law 107-63. The program was developed with support from Teaming with Wildlife, a bipartisan coalition working to increase state funding for wildlife conservation. This program provides funding aimed at preventing wildlife population declines and keeping common species common. The funds are intended to work in conjunction with other funding sources, not to replace existing programs, and are only a small portion of the funding that is actually required to implement the WAP conservation actions. The other necessary funds will be matched by partners.

As congressionally mandated by this program, each state and the District of Columbia were required to submit a WAP to the US Fish and Wildlife Service by October 2005. These strategies provide an essential foundation for the future of wildlife conservation and a stimulus to engage the states, federal agencies and other conservation partners to

think strategically about their individual and coordinated roles in prioritizing conservation efforts.

These programs were designed to provide annual allocations for the development and implementation of programs to benefit wildlife and their habitats. The funding was intended to supplement, not duplicate, existing fish and wildlife programs, and to target species of greatest need of conservation, species indicative of the diversity and health of the state's wildlife, and species with low and declining populations, as deemed appropriate by the state's fish and wildlife agency.

These plans must incorporate these **8 required elements**:

1. Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife;

2. Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1);

3. Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats;

4. Descriptions of conservation actions proposed to conserve the identified species and habitats, and priorities for implementing such actions;

5. Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions;

6. Descriptions of procedures to review the Plan at intervals not to exceed ten years;

7. Plans for coordinating the development, implementation, review and the revision of the plan with Federal, State and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats;

8. Congress also affirmed through this legislation that broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the Species in Greatest Need of Conservation that Congress has indicated such programs and projects are intended to emphasize.

The Association of Fish and Wildlife Agencies (AFWA) and the US Fish and Wildlife Service (USFWS) established **guiding principles** to supplement the 8 required elements (IAFWA 2002). These guiding principles provide recommendations across four topics that help improve and strengthen the WAP development and revision process. The District used these principles to guide the development of the WAP. They include:

<u>Planning Process and Partnerships</u>

a. Involve multiple staff levels within each agency, and broad public-private partnerships, to develop and implement the Plan-Strategy.

b. Involve partners that have the authorities necessary to ensure that the Plan-Strategy addresses the full range of issues at hand.

c. Build capacity for cooperative engagement among all partners in the effort, and make sure that it is productive, so trust and confidence grow, and organizational and interpersonal relationships become strengths of the Plan-Strategy.

d. Share responsibility and credit for planning and implementation among all partners, who collectively share responsibility for success of the Plan-Strategy.

e. Focus on efficiency and effectiveness, so the value added in planning and implementation is commensurate to the funds invested.

f. Ensure that the planning processes and the resultant Plans-Strategies are dynamic so they can be improved and updated efficiently as new information is gained.

g. Communicate effectively with stakeholders, other partners, and the public, early and often.

h. The planning processes, and the decisions made during planning, should be obvious to those who read and use the Plan-Strategy, and repeatable – document the processes and the decisions so the next planning cycle can build on this one.

<u>Focus and Scope</u>

a. Base the Plan-Strategy in the principles of "best science," "best management practices," and "adaptive management," with measurable goals, objectives, strategies, approaches, and activities that are complete, realistic, feasible, logical, and achievable. Describe these processes and practices sufficiently that partners understand what they entail and how they should function.

b. Address the broad range of wildlife and associated habitats, with appropriate priority placed on those species of greatest conservation need and taking into account the relative level of funding available for conservation of those species

c. Integrate and address wildlife-related issues statewide, across jurisdictions and interests, and coordinate with parallel efforts in other States and countries.

d. Combine landscape/ecosystem/habitat-based approaches and smaller-scale approaches (e.g. focal, keystone, and/or indicator species; guilds; species of special concern) for planning and implementation.

e. Make the Plan-Strategy an effective, long-lasting blueprint for conservation that provides a broad vision and priorities, so a broad array of organizations, including other government agencies and NGOs, can help realize the vision. The

Plan-Strategy should have sufficient flexibility to respond to the full spectrum of conditions and circumstances likely to be encountered within the planning area.

Format and Content

a. Make the Plan-Strategy readable, understandable, and useful, with well-defined issues, short and long-term goals and objectives, strategies, and realistic measures of performance that enable State agencies and their partners to demonstrate accountability.

b. Make full and effective use of relevant existing information; in particular, integrate appropriate elements of other plans and initiatives (such as Partners-in-Flight and the many regional and other plans), databases, GIS layers, records, reports, other information sources, and management information systems that overlap or complement these Plans-Strategies.

c. Identify knowledge gaps, as well as areas of knowledge, to help focus future efforts to improve understanding and planning, but do not allow a lack of information to inappropriately limit necessary short-term application of the best available science and good judgment in decision-making.

d. Make the Plan-Strategy spatially explicit, to the extent feasible and appropriate, with a full complement of GIS and other maps, figures, and other graphics, as well as appropriate text to provide sufficient detail and consistency in describing species and habitat conditions, conservation needs, conservation recommendations, and other issues/actions, so it can be used effectively by all partners.

e. Use "threats analyses," "risk and stressor assessments," and other techniques to help set priorities for goals, objectives, strategies, and activities.

f. In addition to wildlife, address factors that can have substantial impact on wildlife conservation, such as management of invasive species, wildlife-related and conservation-related education, law enforcement, and outdoor recreation.

g. Include a comprehensive glossary, so partners and the public have a shared and common understanding of key terms used in the Plan-Strategy.

h. Develop an updatable information system to monitor Plan-Strategy implementation and the status and trends of wildlife and habitat.

i. Consider wildlife conservation-related education and wildlife-associated recreation as tools that can help accomplishing conservation goals.

Completion, Outcomes and Availability

a. Provide annual written progress updates on the planning effort and progress to AFWA's CARA Implementation Committee each September, in addition to annual performance reports that must be submitted to the U.S. Fish and Wildlife Service pursuant to Federal Aid guidelines.

b. Ensure that the Plan-Strategy clearly and definitively meets State obligations to Congress under the WCRP and SWG legislation, and to the U.S. Fish and Wildlife Service with regard to Federal Aid administration.

c.   Provide sufficient documentation in or with the Plan-Strategy to facilitate public understanding of the decisions that are made, how and why they were made.

d.   Make the Plan-Strategy a driving force in guiding activities under diverse wildlife and habitat conservation initiatives, and usable for helping to inform land-use decision-making.

e.   Make the Plan-Strategy readily available to the public in a variety of media.

f.   Provide a mechanism for reporting accomplishments and tracking progress so local partners are aware of both.

g.   Ensure that the Plan-Strategy can be implemented, i.e. that it is administratively and politically feasible, and that there are sufficient resources (funding and staff) among the partners to accomplish significant gains at a large scale, and within an appropriate time frame, to preserve our Nation's wildlife heritage.

Background on the DC Fisheries and Wildlife Division

The DC Fisheries and Wildlife Division was charged with developing and implementing the District's WAP. The primary responsibility for managing and protecting wildlife rests with the states and the District of Columbia (Musgrave et al. 1993).

The Division belongs to the District Department of the Environment. Currently, the Division is divided into three branches:

> o   Fisheries Research Branch
> o   Wildlife Research Branch
> o   Aquatic Education Branch

The **Fisheries Research Branch** was implemented as a program in 1986. Its mission is to protect and enhance the District's fish populations and aquatic resources. The Branch conducts annual surveys to monitor populations of migratory and resident fish as well as assess water quality conditions and the state of aquatic habitats. This data is used to identify the conservation needs of the District's fish species and their habitats (Tilak and Siemien 1990-1997, Siemien 1998-2005).

Current research projects include:
o   Anadromous and resident fish surveys
o   Ichthyoplankton studies to determine the spawning success of both anadromous and resident fish species
o   Research to determine age and growth rate of fish
o   Monitoring and evaluation to assess and improve fish habitat
o   Monitoring to assess the yearly trends of the extent, density, and species composition of submerged aquatic vegetation
o   Restoration activities including a hatchery for American Shad, one of the District's most critical fish species of greatest conservation need
o   Angler surveys to determine who is fishing in the District

The **Wildlife Research Branch** was established in 2000 and began implementing the DC Natural Heritage Program in 2005. Its mission is to protect and enhance the District's wildlife species and their habitats.

Current research projects include:
- o Annual survey of migratory, resident and breeding bird species
- o Annual winter waterbird and shorebird survey
- o Annual reptile and amphibian survey

The purpose of these surveys is to build the foundation for developing an historical database from which population trends and conservation needs can be identified. Additional surveys are being implemented to include all wildlife taxa, including mammals, invertebrates and plants. A future research technique may include establishing a Monitoring Avian Productivity and Survivorship (MAPS) station within the District, which would determine the productivity and survivorship of breeding bird species. As part of this WAP, these surveys will be used to monitor the success of the WAP's conservation actions and revise the Plan, as necessary.

The **Aquatic Resources Education Branch** involves students and the general public in wildlife conservation. The Branch plays an integral role in fulfilling Required Element #8—public involvement in the development and implementation of the WAP.

Current projects include:
- o Residential Backyard Habitat Program
- o Schoolyard Habitat Program
- o Fishing clinics
- o Aquatic Resources Education Center (AREC)

The Residential Backyard Habitat Program educates the public to the mutual benefits of providing wildlife habitat in their own backyards. Fishing clinics provide hands-on instruction to the public on fishing techniques, while providing information on species and habitat ecology and generating interest in fish conservation. The AREC is a facility devoted to educating students and the public about the aquatic ecology of the Potomac and Anacostia Rivers (Whitworth 1998-2004). The AREC houses exhibits, displays, aquariums, and educational computer programs. In 2005, it also became the location of the American Shad hatchery.

Problem and Need

Sustaining a healthy environment among an urban area is one of the greatest conservation challenges of land managers, developers and policymakers within the District. The staff of the DC Fisheries and Wildlife Division aims to meet this need by developing and implementing the WAP. However, there are many challenges in terms of taking conservation actions, including research needs and building partnerships and public interest.

In response to these needs, the Division has taken the lead in building the partnerships that capture the expertise to fulfill the District's conservation goals. This has been made possible by the funds provided by the US Fish and Wildlife Service. Thus far, the Division established a Fisheries Research Branch that includes long-term planning and conservation efforts for the District's fish species and their habitats. Fifteen years of research on the District's fish species has helped enhance fish populations, water quality and public interest in fish and water conservation. However, 12 of the District's 90 fish species are species of greatest conservation need and many aquatic habitats are in dire condition. Because the Fisheries Research Branch provides most of the data used to develop fish conservation strategies, the continued financial support for this program will be critical for the success of the District's WAP.

The Wildlife Research Branch, on the other hand, has only been implemented since 2002. Therefore, at the time of writing this WAP, only three years of research have been conducted for bird species and none for other wildlife taxa. Many more years of research will be needed to be able to identify population trends and conservation needs for the District's 136 non-fish wildlife species of greatest conservation need. There are also significant knowledge and resource gaps in terms of research and conservation planning that must be addressed before the Branch can conduct this research. Furthermore, the District does not have jurisdiction over much of the priority land for conservation. Instead, priority habitats in the District span both local and federal land. Therefore, the Wildlife Research Branch has partnered with the National Park Service and other land management agencies, both federal and local, to develop and implement the District's WAP.

As mentioned, the Division staff has focused its research on fish and bird species at the time of writing this WAP because of funding limitations. It currently has very little information regarding other wildlife taxa. Therefore, many of the examples and explanations used in this document refer to bird and fish species. This is for no other reason than the Division has more extensive population and ecology information for the District's fish and bird species. The text in this document reflects the best knowledge available and does not intend to prioritize one taxon over another. Where the document lacks information on other wildlife taxa indicates the need for further research and exploration of those species.

Threats

Today, much of the District's land is urbanized and its habitats are fragmented, causing dire consequences for wildlife. Indeed, as a result, the District is home to 149 species of greatest conservation need. For example, the District is an important breeding location for the Cerulean Warbler, but has limited unfragmented hardwood forest to sustain them.

The conservation actions identified in the District's WAP are targeted at specific threats to habitats. Because the number and extent of the threats are constantly increasing, there

has never been a more important time to restore the District's natural heritage and there is no better tool to develop conservation strategies than with the funds from the State Wildlife Grant Program.

Major threats include invasive and alien species, recreation, fragmentation, dumping, contaminants, sedimentation, changes to hydrologic regimes, stormwater erosion, and pollution. Chapter 4 provides tables that prioritize all of the threats and their associated habitats, as well as provides descriptions of threats. Chapter 5 describes conservation actions targeted at threats to specific habitats.

Conservation Legislation and Partners

Existing Conservation Legislation
While the District has a long way to go in terms of wildlife conservation, there are already several pieces of legislation in place that serve to protect the District's wildlife. Below is a selection of existing conservation legislation.

o   State Wildlife Laws (Musgrave and Stein 1993)
            State power to manage wildlife
            DC wildlife policy and enforcement
            Fishing licenses

o   DC Official Code (DC 2002)
            Title 8—Environmental and Animal Control and Protection
            Chapter 16—Criminal Offenses—Game and Fish Laws

o   Water Pollution Control Act of 1984
            Chapter 15—No hunting, killing or taking of wildlife
                Exceptions

o   Parks and Recreation Master Plan (DPR draft)
            Framework for improving parks and recreational areas
            Incorporating environmentally-friendly practices

o   Combined Sewer Overflow Control Plan (DC Water and Sewer Authority 2002)
            Improvements to Blue Plains Wastewater Treatment Plant

o   DC Office of Planning
            DC Comprehensive Plan (DC OP draft)
                Chapter 4—Environmental Protection Element
            Anacostia Waterfront Initiative (DC OP 2000)
                Water quality
                Shoreline restoration
                Fishable and swimable by 2020

o   Wetlands Act of 1972 (Partners in Flight 1999)
         Federal protection for the Potomac River

o   Capper-Crampton Act (NPS 2003)
         Establishment of parks in the National Capital Region

Key Conservation Partners

In response to the threats listed above, conservation agencies and organizations are taking action for the District's wildlife species of greatest conservation need. Partnerships with these agencies and organizations were and remain essential to both the development and implementation phases of this WAP. The varied jurisdictions of land among local and federal agencies required coordination among these entities in order to best conserve species of greatest conservation need all over the District. The synergy of expertise resulted in the best possible strategies for conservation actions. This following conservation agencies and organizations share the interest in conserving the District's wildlife species and their habitats and contributed to the planning process depending on their expertise.

Government agencies

DC Fisheries and Wildlife Division

   The Division is taking the lead on developing and implementing the WAP. The mission of this Division is to protect and enhance the District's wildlife and habitats. The Fisheries Research Branch of this division has developed and implemented management plans for the fish species of the District that include population studies and water quality management. It supplied all of the data concerning fish species and habitat conservation for this WAP. The Wildlife Research Branch of this division is implementing a program to inventory and conserve bird species occurring in the District. The Aquatic Education Branch is involved in the public outreach and education portion of the WAP.

National Park Service

   The mission of the National Park Service (NPS) is to preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations (http://www.nps.gov/legacy/mission.html). NPS manages parks, monuments, cemeteries, and other natural and historic sites in the District. Both Rock Creek Park and National Capital Parks—East have been central the development of the WAP. They were the primary sources of species and habitat data, as well as helpful in editing and developing the selection processes. They are also currently developing the Canada Goose management plan that has been incorporated into the WAP. A strategy of this WAP is to fully implement their existing conservation actions. NPS will remain a close partner in the implementation and review phases of the WAP.

United States Geological Survey

The mission of the Patuxent Wildlife Research Center of the United States Geological Survey (USGS) is to excel in wildlife and natural resource science and provide the information needed to better manage the nation's biological resources (http://www.pwrc.usgs.gov/aboutus/mission.cfm). The Center was the primary source of data regarding the status of breeding birds in the District, as well as helpful in editing and developing the selection processes. It also participates in the Canada Goose management actions and will be important for the implementation phase of the WAP.

Maryland Departme nt of Natural Resources

The mission of the Maryland Department of Natural Resources (MD DNR) is to preserve, protect, enhance and restore Maryland's natural resources for the wise use and enjoyment of all citizens (http://www.dnr.state.md.us/mission.asp). MD DNR is also responsible for developing the WAP for the state of Maryland. Because Maryland and the District share common habitats and regional priorities, the District coordinated with MD DNR in the development of the WAP to ensure consistency. As a result, Maryland and the District share many of the same criteria and Maryland's species of greatest conservation need were included in the species selection process of this WAP.

United States Fish and Wildlife Service

The mission of the US Fish and Wildlife Service (USFWS) is to work with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people (http://www.fws.gov/mission.html). USFWS provided guidance on the approach, format, and selection of species of the WAP.

United States Department of Agriculture

The mission of the Agricultural Research Service (ARS) is the main in-house scientific research agency of the US Department of Agriculture (USDA) (http://www.ars.usda.gov/main/main.htm). Part of their plant research efforts comes from the National Arboretum (USNA). The USNA was created in 1927 by an Act of Congress and placed under USDA. The National Arboretum provided data on threats to habitats and a strategy of this WAP is to fully implement their existing and future conservation actions.

Nongovernmental partners

Natural Heritage Program

The National Heritage Program (NHP) inventories, catalogues and facilitates protection of rare and outstanding elements of the natural diversity of the United States. The plant and animal species identified by the NHP are species that merit conservation action and thus their ratings were included in our criteria for selection species of greatest conservation need. The NHP also provided much of the data

regarding the listing of all species occurring within the District. DC Fisheries and Wildlife houses the NHP of the District and will carry out its mission in accordance with the WAP.

The Nature Conservancy

The mission of the Nature Conservancy (TNC) is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive (http://nature.org/). TNC provided guidance on the approach and format of the WAP.

Maryland-DC Audubon

The mission of the National Audubon Society is to conserve and restore natural ecosystems, focusing on birds, other wildlife and their habitats for the benefit of humanity and earth's biological diversity. MD-DC Audubon was a key partner in developing criteria for determining species of greatest conservation need and key habitat types.

DC Audubon

DC Audubon provided habitat data for bird species and helped in the public outreach portion of the WAP by informing its members of the public review meetings.

Association of Fish and Wildlife Agencies

The Association of Fish and Wildlife Agencies (AFWA) represents the government agencies for North America's fish and wildlife resources. AFWA applies expertise in science, policy, economics and coalition-building to serve its members as a national and international voice on a broad array of wildlife and conservation issues. AFWA was key to organizing this nation-wide effort by, among other activities, holding training workshops for the developers of WAPs and coordinating the effort across the nation.

Defenders of Wildlife

The mission of Defenders of Wildlife is to dedicate themselves to the protection of all native wild animals and plants in their natural communities (http://www.defenders.org/about/). Defenders of Wildlife provided guidance on the approach and format of the WAP.

Academic partners

Howard University

A Howard University professor provided data on the status of amphibian species of conservation need.

Overview

The overview explains how the 8 Required Elements were met and serves as a guide to locating the Elements within the Wildlife Action Plan (WAP). The first part describes in detail the organization and format of the WAP to help navigate the document. The second part is a road map to the 8 Required Elements, including page numbers.

Organization and Format of the Wildlife Action Plan (WAP)

The District's WAP is the blueprint for a plan of action for restoring the District's wildlife heritage. Its organization is based on incorporating the 8 elements required by Congress. First, it illustrates the District's existing wildlife and habitats and their conservation needs. Then, it describes plans for action and monitoring based on those needs.

Introduction. The Introduction provides the background, purpose and scope of the WAP. It describes the goals, approach, value, legislative mandate and guidance, background on the DC Fisheries and Wildlife Division, problem and need, threats to wildlife in the District, existing conservation legislation in the District, and the list of partners that contributed to the development of this WAP.

Chapter 1 – Approach. The Approach describes the process used to develop the WAP and meet the 8 Required Elements. It includes the timeline of events, including meetings with working groups and the public. It describes the processes used to select and rank the species, habitats and threats that are targeted by this WAP. Finally, it describes programmatic challenges that must be met to successfully implement this plan.

Chapter 2 - District Overview. The District Overview briefly illustrates the current geography of the District. It describes the District's two ecoregions and land use and cover. It also places the District in the context of the mid-Atlantic region.

Chapter 3 - Species of Greatest Conservation Need and their Habitats. This chapter describes the condition of the District's species of greatest conservation need and their habitats, as required by Elements #1 and 2. It lists and gives the status and trend of the District's 148 species of greatest conservation need and 13 priority habitat types. It also maps, describes and ranks its 13 priority habitats types, as well as lists the priority habitat locations.

Chapter 4 - Threats. This chapter presents the threats targeted by this WAP, as required by Element #3. It describes the sources and management challenges of the threats to the overall top-five highest-ranking threats to the District's terrestrial and aquatic habitats. It also gives descriptions for the other highest priority threats to each habitat type.

Chapter 5 – Conservation Actions – Habitats. The conservation actions are divided among three chapters, and fulfill Required Element #4. The first chapter—Chapter 5—lists overarching conservation actions that span all of the habitat types and then describes

existing and proposed conservation actions targeted to specific habitats, by providing a fact sheet for each habitat type. The actions are targeted at the top-five ranking threats to each habitat. The associated species of greatest conservation need and priority habitat locations are also provided for each habitat.

Chapter 6 – Conservation Actions - Species. The second conservation actions chapter—Chapter 6—briefly describes the species of greatest conservation need and their conservation concerns, as required by Element #4. This chapter provides the status, range, local habitat, species ecology, and at least one threat and conservation action for most species.

Chapter 7 – Public Outreach and Participation. The third chapter on conservation actions—Chapter 7—describes the strategies for engaging the public in developing and implementing the WAP, as required by Element #8.

Chapter 8 – Monitoring, Review and Revision. The monitoring chapter identifies the District's plan to monitor the species of greatest conservation need, the success of the conservation actions, adapt the Plan to new information and changing conditions, and subsequently review and revise the Plan, as required by Elements #5 and 6. The monitoring plan is divided by taxa: birds, mammals, reptiles, amphibians, fish and invertebrates. It lists existing monitoring actions as well as resources for standard monitoring protocols.

Roadmap to the 8 Required Elements

The District of Columbia, Department of Health, Environmental Division, Wildlife and Fisheries Branch has prepared this guide to D.C. Wildlife Action Plan (WAP) for the National Advisory Acceptance Team (NAAT) and others to readily find sections that address each of the eight required elements.

Required Element #1:

Information on distribution and abundance, including low and declining populations that are indicative of the diversity and health of the District's wildlife	
A. Sources of information on wildlife abundance and distribution	
Ch. 3—Table 5. Species of greatest conservation need	45
Ch. 6—Species Fact Sheets	129
B. Information about abundance and distribution, or plans to obtain this information	
Ch. 3—Table 6. Status and trend of species of greatest conservation need	50
Ch. 6—Species Fact Sheets	129
C. Identification of low and declining populations	
Ch. 3—Table 5. Species of greatest conservation need	45
Ch. 3—Table 6. Status and trend of species of greatest conservation need	50
Ch. 6—Species Fact Sheets	129
D. All major groups of wildlife	
Ch. 3—Table 5. Species of greatest conservation need	45
Ch. 8—Monitoring Species of greatest conservation need	252
Ch. 8—Some invertebrate groups excluded right now due to lack of knowledge	252
E. Species selection process	
Ch. 1—Species selection process	28
Ch. 3—Table 6. Status and trend of species of greatest conservation need	50
Ch. 3—List of species of greatest conservation need may change over time after monitoring and review process	44

Required Element #2:

Descriptions of locations and condition of key habitats	
A. Explanation for level of detail provided, or plans to obtain greater detail	
Ch. 3—Lists, prioritizes, describes, and identifies conservation needs for all key habitat types	44
Ch. 5—Provides threats, conservation actions, and identifies key locations for each habitat type	81

B. Key habitats and their conditions in enough detail to determine best conservation actions	
Ch. 3—Table 8. Status and trend of habitat types	56
Ch. 4—Table 9. Habitat types prioritized	56
Ch. 3—Lists, prioritizes, describes, and identifies conservation needs for all key habitat types	44
Ch. 3—Describes conservation needs for urban landscapes and springs and seeps	44
Ch. 5—Provides threats, conservation actions, and identifies key locations for each habitat type	81

Required Element #3:

Descriptions of problems affecting species or their habitats, and priority research efforts to identify conservation efforts	
A. Sources of information used to determine threats	
Ch. 1—Threat prioritization process	28
B. Threats are detailed enough to determine best conservation actions	
Ch. 3—Specific threats and conservation actions identified for emergent tidal wetlands	44
Ch. 4—Top five threats across habitats identified and detailed	70
Ch. 4—Top five threats for each habitat identified and detailed	70
C. Consideration of threats originating outside of the District	
Ch. 4—National, international and global threats	70
Ch. 4—Sedimentation	70
Ch. 4—Pollution	70
Ch. 5—Coordinate with regional land managers	81
D. Plans to obtain information that is currently unavailable regarding describing threats	
Ch. 3—Ponds and pools	44
E. Needs are sufficiently described to develop projects after Plan is approved	
Ch. 4—Threats	70

Required Element #4:

Descriptions of conservation actions to conserve species and their habitats and priorities for implementing actions	
A. Identification of how conservation actions address threats to species and their habitats	
Ch. 5—Conservation actions are targeted to specific threats	81
B. Descriptions of conservation actions to guide implementation of those actions through the development and execution of specific projects and programs	

Ch. 5—Description of conservation actions	81
Ch. 5—List of partners for implementation	81
Ch. 8—Monitoring the success of actions using measurable goals	252

C. Linkage of conservation actions to objectives that will facilitate monitoring and performance measurement of those conservation actions	
Ch. 3—Forested wetlands/ riparian woodlands/ floodplain	44
Ch. 5—Monitor browser populations	81
Ch. 5—Description of conservation actions with goals	81

D. Descriptions of conservation actions that could be addressed by Federal agencies or regional, national, or international partners and shared with other States	
Ch. 5—List of partners for implementation	81
Ch. 5—Exotic Plants Management Team as overarching action	81
Ch. 5—National Park Service deer management plan	81
Ch. 5—Anacostia Watershed Society goose management efforts	81

E. In cases where there is insufficient information to describe needed conservation actions, research or survey needs for obtaining information to develop specific conservation actions	
Ch. 3—Plans to develop surveys to research unknown status and trend data	44
Ch. 3—Continued research as an overarching conservation action	44
Ch. 8—Develop comprehensive inventory for invertebrates	252

F. Identification of the relative priority of conservation actions	
Ch. 5—Conservation actions are prioritized in that they are linked to items that are prioritized; conservation actions are linked to threats which are prioritized, which are linked to habitats which are prioritized.	81

Required Element #5:

Proposed plans for monitoring species and their habitats, the effectiveness of conservation actions, and adapting these actions to respond to new information or changing conditions.

A. Plans for monitoring species and their habitats	
Ch. 8—Monitoring species of greatest conservation need and their habitats	252

B. Descriptions for how the outcomes of the conservation actions will be monitored	
Ch. 8—Monitoring conservation actions	252

C. If monitoring is not identified for a species, explanations for why it is not appropriate, necessary, or possible	
Ch. 5—Continued research as an overarching action	81

D. Monitoring is to be accomplished at one of several levels including, individual species, guilds, or natural communities	
Ch. 8—Monitoring species of greatest conservation need	252
Ch. 8—Approach to monitoring	252
E. The monitoring utilities or builds on existing monitoring and survey systems or explains how information will be obtained to determine the effectiveness of conservation actions	
Ch. 8—Monitoring species of greatest conservation need	252
Ch. 8—Approach to monitoring	252
F. The monitoring considers the appropriate geographic scale to evaluate status of species and the effectiveness of conservation actions	
Ch. 8—Monitoring species of greatest conservation need	252
Ch. 8—Approach to monitoring	252
G. Adaptiveness of conservation actions and implementation of new actions accordingly	
Ch. 8—Monitoring conservation action	252

Required Element #6:

Descriptions of procedures to review the Strategy at intervals not to exceed ten years.	
A. Process that will be used to review the Plan within the next ten years	
Ch. 8—Review and revision	252

Required Element #7:

Descriptions of the plans for coordinating the development, implementation, review, and revision of the Plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats.	
A. Descriptions of the extent of coordination with and efforts to involve Federal, State, local agencies and Indian tribes in the development of this WAP	
Ch. 1—Roles and Groups—Working Group	28
Ch. 1—Table 2. Working Group participants and their affiliations	31
B. Descriptions of continued coordination with these agencies in the implementation, review and revision of the WAP	
Ch. 3—Partnerships with overbrowsing and vernal pools	44
Ch. 4—Partnerships with invasive species and emergent tidal wetlands	70
Ch. 5—List of partners for implementation	81
Ch. 8—Monitoring partnerships	252

Required Element #8:

Descriptions of public participation in the development, revision, and implementation	
A. Descriptions of the extent of the efforts to involve the pubic in the development of the WAP	
Ch. 1—Public participation process	28
Ch. 1—Table 3. Level of public involvement	32
B. Descriptions of continued public involvement in the implementation and revision of the WAP	
Ch. 7—Public participation and outreach	247

Chapter 1 – Approach

This chapter describes the process by which the District's WAP was developed and how the 8 Required Elements were met.

Timeline

The timeline describes the progress of developing the WAP in chronological order to meet the 8 Required Elements and the final deadline of October 1, 2005. It involves eight main components:

o   Drafting species lists
o   Master list of all species occurring within the District to serve as an historical database
o   List of species of greatest conservation need
o   Coordinating with other land managers and conservation groups in the District, including local and federal agencies and organizations and NGOs
o   Identifying priority habitats
o   Identifying threats to priority habitats
o   Identifying existing conservation actions and developing new ones
o   Developing monitoring protocols
o   Developing a timeline and process for review and revision
o   Developing a plan for public involvement

During Fall 2004, the staff of DC Fisheries and Wildlife Division created an outline for developing the District's WAP. In November, staff identified and met with the Working Group of federal and state partners to explain the process and to solicit their expertise. (Later, representatives from NGOs became active in the Working Group). By the end of the first meeting, a set of criteria was developed from which to develop the list of species of greatest conservation need. Following that meeting, DC Fisheries and Wildlife Division staff drew up a first draft of that list. In subsequent meetings throughout Winter 2004, partners commented on and helped edit the list.

By February 2005, a final draft list was completed and the Working Group began to identify priority habitat types and locations. In April, specific threats to those habitats were identified. In May, existing conservation actions around the District were compiled and new ones were developed where there were gaps.

The first draft was prepared July 2005 and was available for review by the Working Group and the public. The second draft was prepared August 2005 and was again made available for review by the Working Group and the public. The final District WAP was turned into the National Advisory Acceptance Team (NAAT) on October 1, 2005.

Table 1. Timeline used to meet the 8 Required Elements

	Nov	Jan	Feb	Mar	April	May	June	July	Aug
	2004	**2005**							
R.E. #1	1st Working Group meeting, Master List and SGCN list	Final SGCN list							
R.E. #2			Identify key habitats						
R.E. #3				Identify threats	Threat charts				
R.E. #4						Conservation Actions	Conservation Action	Conservation Actions	Conservation Actions
R.E. #5								Monitoring plan	
R.E. #6								Process & timeline	
R.E. #7	Coordinate with land managers	Coordinate with land managers	Coordinate with land managers	Coordinate with land managers	Coordinate with land managers	Coordinate with land managers	Coordinate with land managers	Coordinate with land managers	Coordinate with land managers
R.E. #8				Public involvement strategies				First public review meeting	Second public review meeting

WAP Development Process

Roles and Groups

WAP Coordinator—Ira Palmer

The role of the WAP Coordinator is to oversee the development of the WAP. The role of WAP Coordinator will be reassigned during the implementation phase of the WAP.

Internal Group—DC Fisheries and Wildlife Division

The role of the Internal Group is to develop and implement the WAP. During the WAP development phase, tasks of the group included, but were not limited to:
- o drafting the WAP
- o drafting lists of species, habitats and threats
- o identifying partners
- o involving the public
- o creating the agenda for Working Group meetings

The group consists of the Program Manager for DC Fisheries and Wildlife, the Chief of the Fisheries Research Branch, the Chief of the Aquatic Resources Education Branch, fisheries and wildlife biologists, aquatic educators and the DC Fisheries and Wildlife Division grants coordinator. This group is subject to change during the WAP implementation phase.

The group met formally and informally as necessary.

Working Group—local, state, federal and nongovernmental

The role of the Working Group is to coordinate data regarding species of greatest conservation need, priority habitats, threats, conservation actions, and monitoring protocols. The Working Group was central to the planning process and data collection. Integrating the expertise and existing programs of other agencies and organizations from the region ensures that the most efficient and successful plans are implemented.

The group consists of the DC Fisheries and Wildlife Division and other federal, state, local conservation agencies and organizations, as well as NGOs, including:

1) Federal— provided species and habitat data
- o National Park Service (NPS)
- o US Geological Survey (USGS)
- o US Fish and Wildlife Service (USFWS)
- o US Department of Agriculture (USDA)

2) State— helped create consistency in terms of criteria and format and introduced the National Heritage Program data

o   Maryland Department of Natural Resources (MD DNR)

3) NGO— provided guidance on developing criteria and format
o   MD-DC Audubon
o   DC Audubon
o   The Nature Conservancy
o   Defenders of Wildlife
o   Association of Fish and Wildlife Agencies (AFWA)
o   Natural Heritage Program

Table 2. Working Group Participants and their Affiliations

Participant	Affiliation	Participant	Affiliation
Ira Palmer	DC Fisheries and Wildlife Division (DC FWD)	Shawn Carter	NPS—Center for Urban Ecology
Mary Pfaffko	DC FWD, DC Audubon	Richard Hammerschlag	US Geological Survey (USGS)— Patuxent Wildlife Research Center
Dhananjaya Katju	DC FWD, DC Audubon	Mary Paul	USGS—Patuxent Wildlife Research Center
Jon Siemien	DC FWD	Deanna Dawson	USGS—Patuxent Wildlife Research Center
Michael Kaspar	DC FWD, DC Audubon	Dan Murphy	US Fish and Wildlife Service
Sylvia Whitworth	DC FWD	Susan Greeley	US Department of Agriculture— National Arboretum
Basil Buchanan	DC FWD	Glenn Therres and staff	MD Natural Heritage Program
Susan Rudy	National Park Service (NPS)—National Capital Parks East	Judy Soule and staff	NatureServe
Ken Ferebee	NPS—Rock Creek Park	Doug Samson	The Nature Conservancy
James Rosenstock	NPS—National Capital Parks East	Dave Curson	MD-DC Audubon
Marcus Koenen	NPS—Center for Urban Ecology	Dave Chadwick	Association of Fish and Wildlife Agencies (AFWA)
Scott Bates	NPS—Center for Urban Ecology	Jeff Lerner	Defenders of Wildlife

Public Involvement Summary

As required by Element #8, the public will be involved in both the development and implementation of the WAP. This section describes the role of several different sectors of the District's public in the development phase. Chapter 7 describes the role of the public in the implementation phase of the WAP.

Educators and Students

Before WAP planning efforts began, the Aquatic Resources Education Branch of the DC Fisheries and Wildlife Division was engaging the public in fish and wildlife conservation via education and training efforts. The Branch staff trained fish and wildlife educators and taught District residents. Programs include fishing clinics and classroom activities at the Aquatic Resources Education Center (AREC). This provides a solid foundation from which to involve the public upon implementing the conservation actions of the WAP.

Conservation NGOs

Early in the WAP planning effort, DC Fisheries and Wildlife Division staff engaged NGOs with an interest in wildlife conservation. These NGOs were invited to be members of the Working Group. Some of these groups were familiar with conservation planning and had helped other states develop their WAPs. They commented and advised on both the content and format of the WAP during the development phase of the WAP, and are expected to continue to be involved throughout the implementation phase.

General Public

The general public was provided an opportunity to be involved in the development of the WAP. There were two public comment meetings, during which the public was invited to review the list of species of greatest conservation need and conservation actions. Both meetings were advertised via targeted emails to several conservation organizations. A draft WAP was made available before each meeting. A public notice will also be posted in the *Washington Post*, the *Washington Times*, the *DC Register* for a month, informing the public of how to view and comment on the document. The DC Advisory Neighborhood Commissions will also be notified, advising the public on how to view and comment on the document. In terms of the implementation stage of the WAP, the public will be invited to be involved in conservation actions such as volunteering to participate in wildlife surveys and habitat restoration.

Table 3. Level of Public Involvement in the Development of the WAP

Level of involvement	Type of activity	NGOs	Educators and Students	General Public
Inform	Meetings, Public notices	X	X	X
Involve	Comments/Feedback	X	X	X
Collaborate	Data sharing/Project coordination	X		

Selecting and Ranking Species

With funds from the State Wildlife Grants Program, the District will be able to focus on conserving species that have not traditionally received federal funding. To develop conservation actions for these species, Congress mandated the District to develop and implement the WAP for "species of greatest conservation need." The District was granted the authority to develop the selection process used to identify its species of greatest conservation need.[1] The list includes all wildlife taxa: birds, mammals, reptiles, amphibians, fish and invertebrates.

Before identifying species of greatest conservation need, the District's WAP Working Group compiled a comprehensive list of all wildlife species occurring currently or historically within the District. From this list, species of greatest conservation need were identified. The Working Group developed a list of criteria to guide the selection of those species. The group based its criteria on the set of criteria used by Teaming with Wildlife (TWW), given that TWW spent a great deal of time developing their criteria and that their criteria were closely aligned with criteria used by local and regional organizations.

Selection Criteria

The overall focus and scope of species includes the full array of wildlife species, including historically occurring species. Species with greatest conservation need shall be defined by:

Quantitative, concrete criteria:
- o Endangered, threatened, candidate species, including federally endangered species of Maryland that also occur in DC, species receiving Natural Heritage Program (NHP) combined global and state ranks of G4 and a low S rank.
- o Imperiled species, including globally rare species receiving NHP ranks of G1-G3.

Subjective dependent upon subject matter expertise:
- o Declining species
- o Endemic species
- o Disjunct species
- o Vulnerable species
- o Species with small, localized "at-risk" populations
- o Species with limited dispersal
- o Species with fragmented or isolated populations
- o Species of special, or conservation, concern
- o Focal species (keystone species, wide-ranging species, species with specific needs)
- o Indicator species

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[1] The authority for the DC Fisheries and Wildlife Division to determine the selection criteria for species of greatest conservation need is given in first Required Element of this WAP.

o "Responsibility" species (i.e. species that have their center of range within a state).

o Conservation areas (eg. migratory stopover sites, bat roosts, maternity sites, etc.).

Prioritization Process

The criteria used by the District were modified slightly from the TWW criteria by the District's prioritization process. The Working Group often gave priority to those species that were:

o Listed by local and regional conservation agencies and organizations,

o Feasible to conserve, and

o Urban specialist species.

Prioritizing species listed by local and regional organizations added a local dimension that takes into account factors such as the breeding and migration status of the species. Furthermore, in light of the size and geographic location of the District, it is important to capture greater regional concerns and remain generally consistent with the neighboring states with which the District shares priority species and habitats. Therefore, the District prioritized species included on the lists of local and regional conservation agencies such as the DC Fisheries and Wildlife Division, the National Park Service, the US Fish and Wildlife Service, and the neighboring states of Maryland and Virginia.

However, because the District is relatively small and urban, it is more limited than other states in terms of conserving wildlife. The District is home to a limited number of habitat types and acreage that can make conserving a species unfeasible. Therefore, feasibility was a limiting factor included in the District's prioritization process. In order to make best use of funds, any species that was determined to be unfeasible to conserve was excluded from the list. On the other hand, because the District has a large number of urban habitats, it has many opportunities to affect urban specialist species. Therefore, any species that can use urban landscapes was given priority because the District should take responsibility for urban specialist species.

The final listing was made using the following scoring process:

1. All species listed by Rock Creek Park and National Capital Parks—East, or advised by the US Fish and Wildlife Service as species of greatest conservation need were included on the list. All fish species listed by the DC Fisheries and Wildlife Division as species of greatest conservation need were also included on the list.

2. All species (except birds) that were listed by more than two agencies or organizations as species of greatest conservation need, or breeders that were listed by at least one agency or organization were included on the list. Agencies and organizations that were considered include:

o Maryland Department of Natural Resources

o Virginia Department of Game and Inland Fisheries

   o Endangered Species Act
   o Natural Heritage Program
   o American Fisheries Society
   o Atlantic States Marine Fisheries Commission

3. For birds, all species listed by more than five agencies or organizations as species of greatest conservation need were included. Agencies and organizations include:

   o Maryland Department of Natural Resources
   o Virginia Department of Game and Inland Fisheries
   o Endangered Species Act
   o Natural Heritage Program
   o Partners in Flight Conservation Plan for the mid-Atlantic Piedmont
   o Partners in Flight Landbird Conservation Plan
   o North American Waterbird Conservation Plan
   o North American Waterfowl Management Plan
   o Breeding Bird Survey

The list of species of greatest conservation need is located in Chapter 3. The list of species and their scores is located in Appendix 1.

Selecting and Ranking Habitats

After identifying species of greatest conservation need, the Working Group divided those species into their habitat types and locations using data from the DC Fisheries and Wildlife Division, the US Fish and Wildlife Service, the National Park Service, the US Geological Survey, Partners in Flight, MD-DC Audubon, and DC Audubon. Priority habitats were chosen based on the expert opinion of the Working Group members. GIS maps were produced to locate those habitats and can be found in Chapter 3. Because the exact location of certain species is sensitive information and undisclosed to the public, the mapping of their habitats may be limited.

The source of habitat condition data was the Working Group partners who have jurisdiction over the management of those habitats. Status and trend were determined using their expert opinion and by averaging the condition over all locations within each habitat type in their jurisdiction. Criteria for determining status and trend were based on the threats identified in Chapter 4. The trend timetable covers the current trend, as well as the expected trend over the next 5-10 years.

Scoring of habitat condition was based on a four-point scale (4=excellent, 1=poor). To avoid underreporting, we gave full weight to areas of fair or poor habitat condition. Specifically, on a four-point scale, in cases of 2.5 or 3.5, the score was rounded down to 2 or 3, respectively.

A table ranking the status and trend of habitat types is located in Chapter 3.

Habitat types are prioritized based on the following process:
- o # Species of greatest conservation need
- o Acreage
- o Habitats that have many potential conservation opportunities may be given weight during the implementation process

A table with the prioritized list of habitats is located in Chapter 3.

Selecting and Ranking Threats

The conservation actions included in this WAP are targeted at specific threats to habitats. The District's species of greatest conservation need and their habitats face considerable threats. The District is especially vulnerable to those threats caused by urbanization such as fragmentation and pollution. In fact, because the District's ratio of land area to human population, there are so many threats that it would be virtually impossible to address them all in one plan. Thus, while all the threats are important and have been listed in this WAP, in the interest of feasibility, only the highest-ranking threats were targeted. The Working Group developed a process to determine the top-ranking threats that would be feasible to address in this version of the WAP.

The first step was to list and rank all of the threats to each of the priority habitat locations within the 13 habitat types. The resident experts within the Working Group determined the threats and ranked each threat as "high," "medium," or "low" according to their expert opinion.

The second step was to average the ranks across habitat types. These averages are arranged into two summary threat tables—one for terrestrial habitats and one for aquatic habitats and include all threats. As explained above, due to feasibility limitations, only the top five threats were targeted. Chapter 4 describes the top five highest-ranking threats across all habitats. Chapter 5 describes the conservation actions being taken for the top five highest-ranking threats for each habitat type.

Programmatic Challenges

There can be many administrative and management challenges to implementing the conservation actions included in this WAP. This section presents some of the obstacles that must be overcome before the District will be able to effectively implement its conservation actions.

Shared jurisdictions
The DC Fisheries and Wildlife Division is responsible for the development and implementation of the WAP for the entire District. However, the District's land is divided into many jurisdictions. Thus, conservation actions must coordinate all of these land

managers. Determining the role of each and serving everyone's interest presents a challenge to a coordinated conservation effort.

The District also shares habitat with the surrounding states and region. It is home to several stopover points for migratory species that spend their lives traveling across the region. Since their habitats cross borders, the District is affected by factors across those borders including air and water quality. Therefore, the District must coordinate with land managers of the region and attempt to address cross-border pollution issues.

Communication
Communication among partners is essential. Communication helps, for example, to reduce redundancy in data collection and analysis. However, communication among a large group of agencies and organizations can be difficult. Moreover, these groups can have conflicting goals or fundamentally different approaches to conservation. While partnerships have been formed, the effort to maintain the partnerships will remain a challenge.

Information management
Information management format preferences vary across agencies and organizations. The District's planning process has been one of integrating data from several different sources. For the most part, data sharing was facilitated because all partners used similar information management formats. However, this may not be the case when sharing data with other conservation managers across the region or the nation. In order to effectively coordinate with those conservation managers, standardization among data management formats should be established.

Chapter 2 – District Overview

The District has an interesting dynamic in terms of the interface between humans and wildlife. It is home to both a bustling metropolis as well as a retreat for wildlife and recreationalists. Today, the District boasts more than 900 acres of city parks and more than 6,700 acres of national parkland (DC OP draft). While it can be difficult for humans and wildlife to coexist within the borders of one city, the District actually has an unexpectedly wide diversity of wildlife and habitats. This coexistence between humans and wildlife can improve and thrive with comprehensive strategic planning.

This chapter gives context to the District's WAP by providing an overview of the District's geography and land use. The chapter is divided into three parts: the District's ecoregions, land use, and regional context.

Ecoregions

An ecoregion is defined by the World Wildlife Fund as a large area of land or water that contains a geographically distinct assemblage of natural communities that

- o shares a large majority of species and ecological dynamics,
- o shares similar environmental conditions, and
- o interacts ecologically in ways that are critical for longtime persistence (http://www.worldwildlife.org/science/ecoregions.cfm).

The District is located between two ecoregions: the mid-Atlantic Piedmont and the mid-Atlantic Coastal Plain. Essentially, the ecoregions divide the District in half diagonally along the fall line, with the Coastal Plain covering the southeastern half and the Piedmont covering the northwestern half.

The District shares these ecoregions with the surrounding states of the mid-Atlantic region, including Maryland, Virginia, Pennsylvania, New Jersey and, in the case of the Coastal Plain, Delaware, making the District geographically similar to those states. This has many important implications for conservation planning. Issues important to habitats within the District are also important to the surrounding states. Therefore, coordination with those states should be a central component to developing conservation strategies.

The following section gives an overview of the characteristic geography and natural history of these two ecoregions.

Mid-Atlantic Piedmont Ecoregion
(Physiographic Area 10)
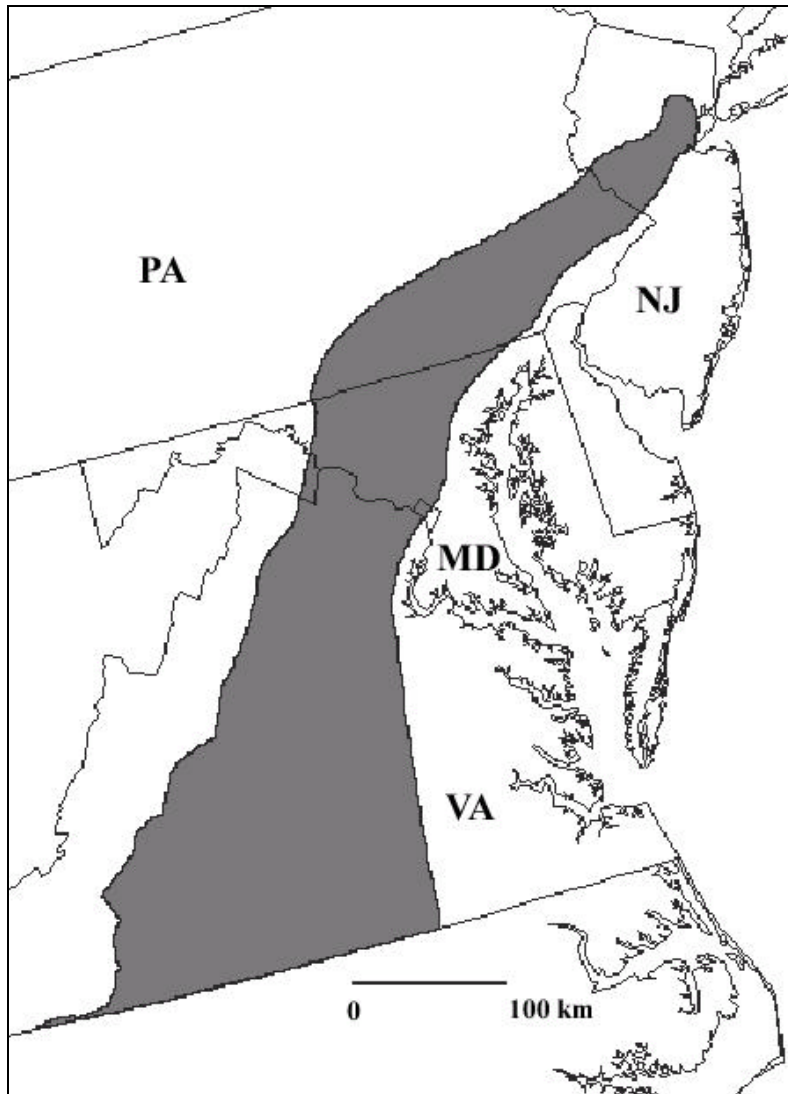
Figure 2.1 Physiographic Area 10 (Source: PIF)

The mid-Atlantic Piedmont extends into Virginia, Maryland, southeastern Pennsylvania and northern New Jersey. It currently covers approximately 66,491 sq km in total. The region is bordered by mid-Atlantic Coastal Plain to the east and the Appalachian Mountains to the west. Beginning at the fall line at 60m in elevation, the Piedmont extends west to the Blue Ridge and the Ridge and Valley regions of the Appalachian Mountains, reaching elevations of 300-600m. The topography of the Piedmont is higher, rolling and more rugged than the Coastal Plain and its soils are composed of erosion-resistant igneous and metamorphic rock, rather than the sands and clays of the Coastal Plain (Kearney 2003).

Mid-Atlantic Coastal Plain Ecoregion
(Physiographic Area 44)
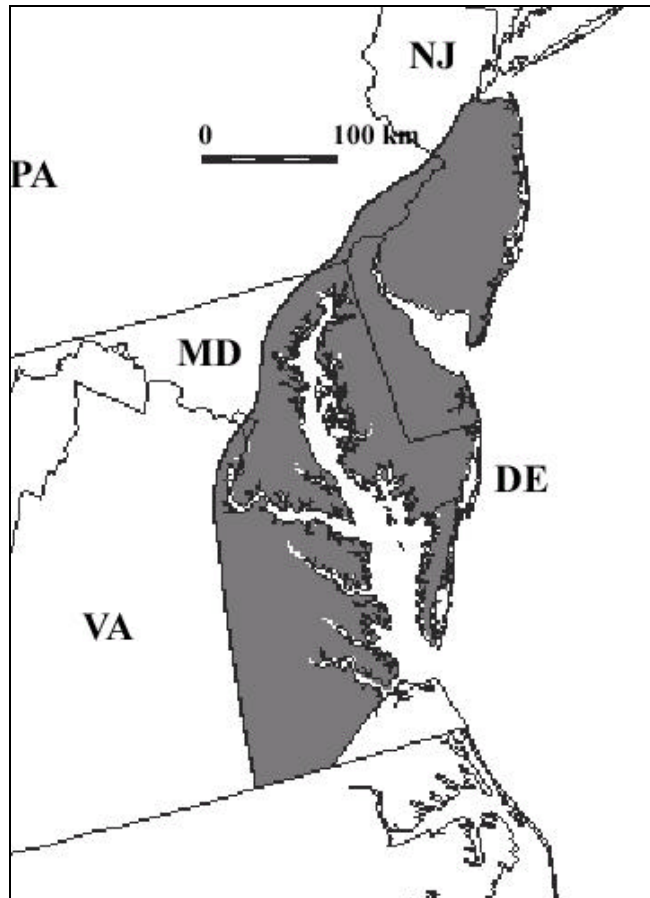
Figure 2.2 Physiographic Area 44 (Source: PIF)

The mid-Atlantic Coastal Plain extends into Virginia, Maryland, Delaware, Pennsylvania and New Jersey. It currently covers approximately 56,220 sq km in total. The region is bordered by the Atlantic Ocean to the east and the fall line to the west. From the west, rivers flow down from the Piedmont and mountains, including the Appalachian Mountains, where they slow down and release sediment onto the Coastal Plain. At this point, the low-lying plain reaches an elevation of less than 80m and is characterized by bays and tidal rivers, such as the Chesapeake Bay and Potomac River. The soils are primarily derived from the sediments deposited from the mountains and are slow draining, leading to the development of many types of expansive wetlands (Watts 1999).

In 1995, Bailey provided descriptions of the ecoregions of the U.S. Forest Service classification system (McNab and Avers 1994, Bailey 1995). The Nature Conservancy (TNC) adapted Bailey's system (1995) to classify ecoregions for its regional planning effort (Groves et al. 2002). The District falls within TNC's Chesapeake Bay Lowlands and the Lower New England Northern Piedmont Ecoregion (Figure 2.3).
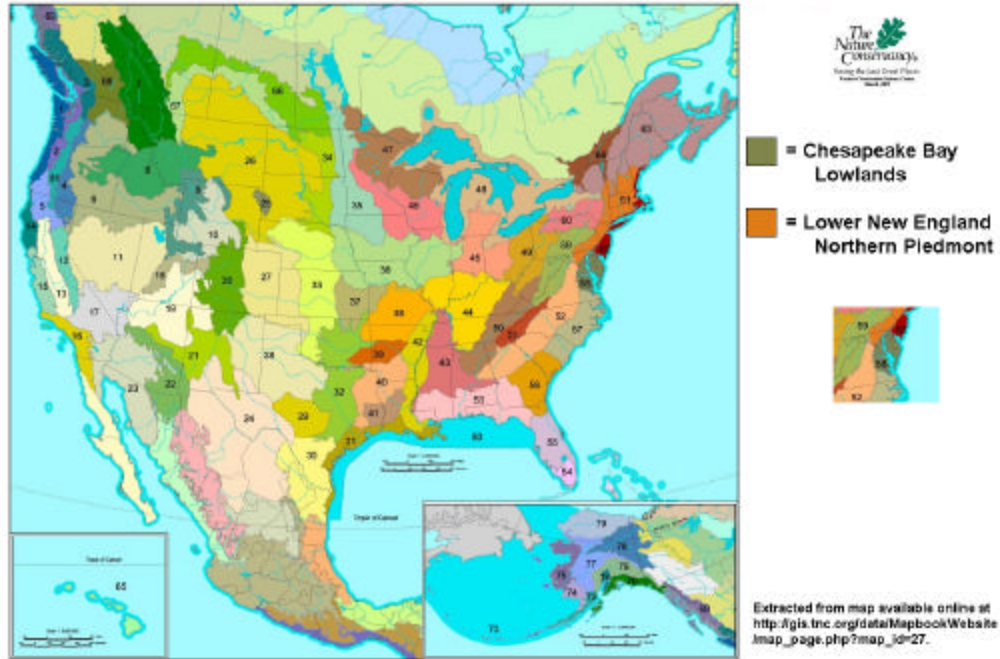
Figure 2.3 TNC Ecoregion System (Source: TNC)

In 1998, the North American Bird Conservation Initiative, in conjunction with Partners In Flight, developed its Bird Conservation Regions (BCR) based on TNC's Ecoregions. The District falls within two Bird Conservation Regions: the Piedmont (BCR #29) and the England/Mid-Atlantic Coast BCR (#30) (Kearney 2003, Watts 1999) (Figure 2.4).
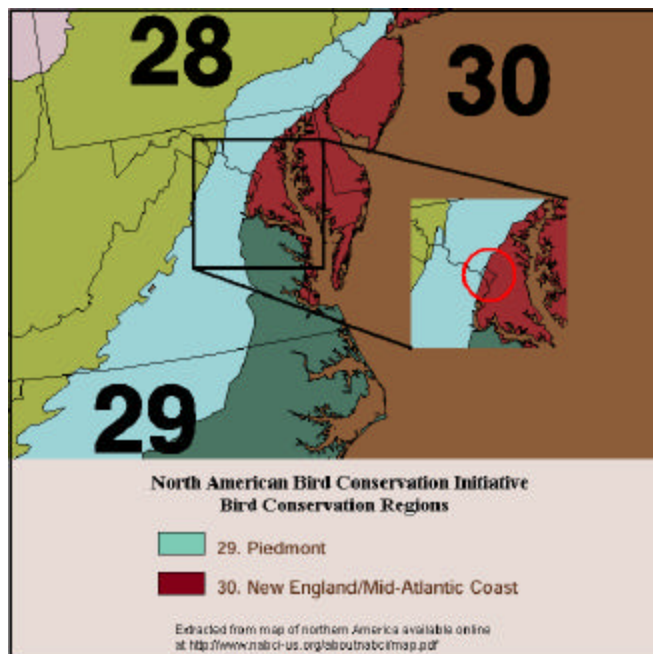
Figure 2.4 North American Bird Conservation Initiative Bird Conservation Regions (Source: NABCI)

Land Use

While the District is considered an urban center with a large amount of developed land, there are actually multiple other land uses. The DC Office of Planning implements a Comprehensive Plan that includes a land use element (DC OP draft). It identifies many elements of land use within the District. Figure 2.5 depicts the land use element "Parks and Open Space".

Figure 2.5 Land Use Map of DC (Source: DC Office of Planning 2006)

Regional Context

The District is home to many habitats for species of greatest conservation need. These habitats are part of an ecological system that is larger than the boundaries of the District, giving the District an important regional context. The District belongs to the mid-Atlantic region of the United States, which also includes Maryland, Virginia, Delaware, West Virginia and Pennsylvania (EPA http://www.epa.gov/region03/index.htm). When viewed as part of the region, the District occupies a comparatively small area of land. Therefore, it is important to view the District in the context of the larger geographical region to gain a full understanding of the needs of shared species and habitats.

The District is bordered by the states of Maryland and Virginia. Both of these states are home to common priority species and habitats. For example, the Chesapeake Bay is an important habitat that extends across the two states and the District. Furthermore, the District is home to migratory species that spend only part of their lives in the District and spend the other part with its neighbors.

Given the regional context, it is essential to coordinate not only with conservation agencies and organizations within the District, but also with conservation agencies and organizations from around the region. In response, the criteria used to determine species of greatest conservation need accounted for the concerns of the District's neighboring states, Maryland and Virginia, as well as regional conservation plans such as the Partners in Flight (PIF) conservation plans.

Chapter 3 – Species of Greatest Conservation Need and their Habitats

This chapter describes the status and trend of the District's species of greatest conservation need and their priority habitats.

Species of Greatest Conservation Need

Element #1 requires that the District provide information on the distribution and abundance of wildlife, including low and declining populations, that are indicative of the diversity and health of the District's wildlife. As such, the following section lists the District's species of greatest conservation need and indicates their status and trend.

As part of protecting the diversity of the District's wildlife, it is critical to conserve all types of wildlife species, including birds, mammals, reptiles, amphibians, fish and invertebrates. The District's species of greatest conservation need also include a variety of types including resident, breeding, migratory, endemic and federally protected species.

Resident and breeding species of greatest conservation need
The District's resident and breeding species keep the nation's capital diverse and ecologically healthy. Many of these species are economically important as well. For example, American Shad is a fish species of greatest conservation need that supported an important recreational fishery until it became over-harvested and one of the District's most threatened fish species.

Migratory species of greatest conservation need
The District is located such that it is a stopover point for many migratory species of greatest conservation need. For example, the Cerulean Warbler is a species of greatest conservation need that is a migrant. Maintaining the integrity of migratory stopover points benefits the entire migration path of the species. Conserving habitats located within the District is vital to the efforts made by other states that share the path of the species. In turn, the District must also deal with environmental conditions outside of its jurisdictions that provide the other migration stopover points of the species.

Endemic species of greatest conservation need
Despite the District's small and urban character, it is home to two known endemic species. The Hay's Spring Amphipod and Kenk's Amphipod have been found only in the Rock Creek Valley. They are restricted to shallow groundwater communities of only five springs along Rock Creek (Pavek 2002). Therefore, the District has the responsibility for ensuring their persistence.

Federally protected species of greatest conservation need
Within the District, there are six federally endangered wildlife species protected by the US Fish and Wildlife Service under the Endangered Species Act of 1973 (http://www.fws.gov/endangered/esa.html). They include the Bald Eagle, Bog Turtle,

Atlantic Sturgeon, Shortnosed Sturgeon, Dwarf Wedgemussel, and Hay's Spring Amphipod. The District has no federally endangered mammal or amphibian species of greatest conservation need.

The following table shows what percentage of the District's wildlife species are of greatest conservation need. It also shows the percentage of species by taxa.

Table 4. Summary Statistics of the District's Wildlife Species, by Taxa

Taxa	Total # species in DC	Total # SGCN	% SGCN
Birds	249	35	14
Mammals	53	11	21
Reptiles	47	23	49
Amphibians	29	16	55
Fish	90	12	13
Invertebrates	314	51	16
Total	**782**	**148**	**19**

Species selection

The selection of species of greatest conservation need was made using the best possible information and expertise available at the time. Whereas conditions and threats change over time as a result of conservation actions, new information, and changing conditions, the list is subject to change. As mentioned, as the District implements Required Elements #6 and 7 by monitoring and revising the WAP, a change in the population status or trend of a species may necessitate the modification of the list of species of greatest conservation need.

Table 5. Species of Greatest Conservation Need

Common Name	Scientific Name
Birds	
Acadian Flycatcher	*Empidonax virescens*
American Bittern	*Botaurus lentiginosus*
American Black Duck	*Anas rubripes*
American Woodcock	*Scolopax minor*
Bald Eagle	*Haliaeetus leucocephalus*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Bobolink	*Dolichonyx oryzivorus*
Broad-winged Hawk	*Buteo platypterus*
Brown Creeper	*Certhia americana*
Brown Thrasher	*Toxostoma rufum*
Cerulean Warbler	*Dendroica cerulean*

Common Name	Scientific Name
Chimney Swift	*Chaetura pelagica*
Eastern Meadowlark	*Sturnella magna*
Eastern Towhee	*Pipilo erythrophthalmus*
Field Sparrow	*Spizella pusilla*
Grasshopper Sparrow	*Ammodramus savannarum*
Great Horned Owl	*Bubo virginianus*
Hooded Warbler	*Wilsonia citrine*
Kentucky Warbler	*Oporornis formosus*
Least Bittern	*Ixobrychus exilis*
Louisiana Waterthrush	*Seiurus motacilla*
Marsh Wren	*Cistothorus palustris*
Northern Bobwhite	*Colinus virginianus*
Ovenbird	*Seiurus aurocapilla*
Prothonotary Warbler	*Protonotaria citrea*
Red-shouldered Hawk	*Buteo lineatus*
Scarlet Tanager	*Piranga olivacea*
Sora	*Porzana carolina*
Virginia Rail	*Rallus limicola*
White-eyed Vireo	*Vireo griseus*
Wilson's Snipe	*Gallinago delicata*
Wood Duck	*Aix sponsa*
Wood Thrush	*Hylocichla mustelina*
Worm-eating Warbler	*Helmitheros vermivorus*
Yellow-throated Vireo	*Vireo flavifrons*
Mammals	
Allegheny Woodrat	*Neotoma magister*
American Mink	*Mustela vison*
Eastern Chipmunk	*Tamias striatus*
Eastern Cottontail	*Sylvilagus floridanus*
Eastern Red Bat	*Lasiurus borealis*
Eastern Small-footed Myotis	*Myotis lebii*
Gray Fox	*Urocyon cinereoargenteus*
Northern River Otter	*Lutra canadensis*
Southern Bog Lemming	*Synaptomys cooperi*
Southern Flying Squirrel	*Glaucomys volans*
Virginia Opossum	*Didelphis virginiana*
Reptiles	
Bog Turtle	*Clemmys muhlenbergii*
Common Musk Turtle	*Sternotherus odoratus*
Corn Snake	*Elaphe guttata guttata*

Common Name	Scientific Name
Eastern Box Turtle	*Terrapene carolina*
Eastern Fence Lizard	*Sceloporus undulates*
Eastern Garter Snake	*Thamnophis sirtalis*
Eastern Hognose Snake	*Heterodon platirhinos*
Eastern Mud Turtle	*Kinosternon subrubrum*
Eastern Painted Turtle	*Chrysemys picta picta*
Eastern Ribbon Snake	*Thamnophis sauritus*
Eastern Worm Snake	*Carphophis amoenus amoenus*
Five-lined Skink	*Eumeces fasciatus*
Northern Black Racer	*Coluber constrictor*
Northern Brown Snake	*Storeria dekayi*
Northern Copperhead	*Agkistrodon contortrix*
Northern Ringneck Snake	*Diadophis punctatus edwardsii*
Queen Snake	*Regina septemvittata*
Redbelly Turtle	*Pseudemys rubriventris*
Rough Green Snake	*Opheodrys aestivus*
Scarlet Snake	*Cemophora coccinea copei*
Spotted Turtle	*Chrysemys guttata*
Timber Rattlesnake	*Crotalus horridus*
Wood Turtle	*Clemmys insculpta*
Amphibians	
American Toad	*Bufo americanus*
Bullfrog	*Rana catesbeiana*
Fowler's Toad	*Bufo fowleri*
Marbled Salamander	*Ambystoma opacum*
Eastern Mud Salamander	*Pseudotriton m. montanus*
Northern Cricket Frog	*Acris crepitans*
Northern Dusky Salamander	*Desmognathus fuscus*
Northern Spring Peeper	*Pseudacris crucifer*
Northern Two-lined Salamander	*Eurycea bislineata*
Pickerel Frog	*Rana palustris*
Northern Red Salamander	*Pseudotriton rubber ruber*
Redback Salamander	*Plethodon cinereus*
Red Spotted Newt	*Notophthalmus viridescens*
Spotted Salamander	*Ambystoma maculatum*
Upland Chorus Frog	*Pseudacris feriarum feriarum*
Wood Frog	*Rana sylvatica*
Fish	
Alewife	*Alosa pseudoharengus*
American Eel	*Anguilla rostrata*

Common Name	Scientific Name
American Shad	*Alosa sapidissima*
Atlantic Sturgeon	*Acipenser oxyrhynchus*
Blueback Herring	*Alosa aestivalis*
Bowfin	*Amia calva*
Central Stoneroller	*Campostoma anomalum*
Greenside Darter	*Etheostoma blennioides*
Hickory Shad	*Alosa mediocris*
Shortnosed Sturgeon	*Acipenser brevirostrum*
Silverjaw Minnow	*Ericymba buccata*
Warmouth	*Lepomis gulosus*
Invertebrates	
A Copepod	*Acanthocyclops Columbiensis*
A Copepod	*Acanthocyclops Villosipes*
A Copepod	*Attheyella (Canthocamptus) Illiniosensis*
A Copepod	*Attheyella (Mrazekiella) Illiniosensis*
A Copepod	*Attheyella (Mrazekiella) Obatogamensis*
A Copepod	*Bryocamptus Hutchinsoni*
A Copepod	*Bryocamptus Minutus*
A Copepod	*Bryocamptus Nivalis*
A Copepod	*Bryocamptus Zschokkei*
A Copepod	*Diacyclops Harryi*
A Copepod	*Diacyclops Nearcticus*
A Copepod	*Eucyclops Agilis*
A Copepod	*Macrocyclops Albidus*
A Copepod	*Paracyclops Fimbriatus Chiltoni*
Alewife Floater	Anodonta implicata
Appalachian Grizzled Skipper	*Pyrgus wyandot*
Appalachian Spring Snail	*Fontigens bottimeri*
Brook Floater	*Alasmidonta varicosa*
Crossline Skipper Butterfly	*Polites origenes*
Dwarf Wedgemussel	*Alasmidonta heterodon*
Eastern Comma Butterfly	*Polygonia comma*
Eastern Pondmussel	Ligumia nasuta
Edward's Hairstreak	*Satyrium edwardsii Fontigens bottimeri*
Emerald Spreadwing	*Lestes dryas*
Fine-lined Emerald	*Somatochlora filosa*
Frosted Elfin	*Callophrys irus*
Great Spangled Fritillary Butterfly	*Speyeria cybele*
Green Floater	*Lasmigona subviridis*
Grey Petaltail	*Tachopteryx thoreyi*

Common Name	Scientific Name
Hay's Spring Amphipod	*Sygobromus hayi*
Kenk's Amphipod	*Stygobromus kenki*
Lilypad Forktail Damselfly	*Ischnura kellicotti williamsoni*
Little Glassywing Butterfly	*Pompeius verna*
Mocha Emerald Dragonfly	*Somatochlora linearis*
Monarch Butterfly	*Danaus P. Plexippus*
Mottled Duskywing	*Erynnis martialis*
Pizzini's Cave Amphipod	*Stygobromus pizzinii*
Potomac Groundwater Amphipod	*Stygobromus tenuis potomacus*
Question Mark Butterfly	*Polygonia interrogationis*
Red Admiral Butterfly	*Vanessa atalanta rubria*
Regal Fritillary Butterfly	*Speyeria idalia*
Sedge Sprite	*Nehalennia irene*
Sphagnum Sprite	*Nehalennia gracilis*
Spiny-foot Copepod	*Attheyella villosipes*
Tidewater Mucket	*Leptodea ochracea*
Tiger Spiketail Dragonfly	*Cordulegster errones*
Triangle Floater	*Alasmidonta undulata*
Unicorn Clubtail Dragonfly	*Arigomphus villosipes*
Variegated Fritillary Butterfly	*Euptoieta claudia*
Yellow Lampmussel	*Lampsilis cariosa*

Status and Trend

Element #1 requires the WAP to provide information on low and declining populations. Many of the District's species of greatest conservation need have one of the following population status and trends:

o   Imperiled, vulnerable or declining
o   Stable, but habitat is at risk
o   Imperiled, vulnerable or declining in surrounding region, but undetermined within the District
o   Stable in surrounding region, but undetermined within the District, or
o   Undetermined within the District, but subjectively determined "of greatest conservation need" by resident experts

In cases for which the species have been determined to be imperiled, vulnerable, or declining, or if their habitat is at risk, actions will be implemented to conserve those species or habitats. In cases for which the status and trend is less understood, research and monitoring will be undertaken as a strategy of this WAP until populations, threats and effective actions can be identified. The following table gives a species-by-species indication of these research needs by providing information on their status and trend.

Table 6. Status and trend of Species of Greatest Conservation Need

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
Birds									
1	Acadian Flycatcher				X				X
2	American Bittern	X				X			
3	American Woodcock				X				X
4	American Black Duck				X				X
5	Bald Eagle	X							X
6	Black-crowned Night-Heron	X							X
7	Bobolink				X				X
8	Broad-winged Hawk	X							X
9	Brown Creeper				X				X
10	Brown Thrasher	X							X
11	Cerulean Warbler				X				X
12	Chimney Swift		X						X
13	Wilson's Snipe				X				X
14	Eastern Meadowlark	X							X
15	Eastern Towhee		X						X
16	Field Sparrow	X							X
17	Grasshopper Sparrow				X				X
18	Great Horned Owl	X							X
19	Hooded Warbler				X				X
20	Kentucky Warbler				X				X
21	Least Bittern	X							X
22	Louisiana Waterthrush	X							X
23	Marsh Wren	X							X
24	Northern Bobwhite	X							X
25	Ovenbird	X							X
26	Prothonotary Warbler	X							X
27	Red-shouldered Hawk	X							X
28	Scarlet Tanager	X							X
29	Sora Rail				X				X

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
30	Virginia Rail	PE							X
31	White-eyed Vireo	X							X
32	Wood Duck		X						X
33	Wood Thrush	X							X
34	Worm-eating Warbler				X				X
35	Yellow-throated Vireo	X							X
Mammals									
36	Allegheny Woodrat	PE							X
37	American Mink	X							X
38	Eastern Chipmunk		X						X
39	Eastern Cottontail		X						X
40	Eastern Red Bat		X						X
41	Eastern Small-footed Myotis	X							X
42	Gray Fox	X							X
43	Northern River Otter	X							X
44	Southern Bog Lemming	X							X
45	Southern Flying Squirrel		X						X
46	Virginia Opossum		X			X			
Reptiles									
47	Bog Turtle	PE				X			
48	Common Musk Turtle		X						X
49	Corn Snake				X				X
50	Eastern Box Turtle	X			X				X
51	Eastern Fence Lizard	PE			X				X
52	Eastern Garter Snake		X						X
53	Eastern Hognose Snake	PE							X
54	Eastern Mud Turtle		X						X
55	Eastern Painted Turtle		X						X
56	Eastern Ribbon Snake		X						X
57	Eastern Worm Snake		X						X
58	Five-lined Skink		X						X

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
59	Northern Black Racer		X						X
60	Northern Brown Snake		X						X
61	Northern Copperhead Snake	X							X
62	Northern Ringneck Snake		X						X
63	Queen Snake	X							X
64	Redbelly Turtle		X						X
65	Rough Green Snake		X						X
66	Scarlet Snake	PE							X
67	Spotted Turtle	PE							X
68	Timber Rattlesnake	PE							X
69	Wood Turtle	PE							X
Amphibians									
70	American Toad		X						X
71	Bullfrog		X						X
72	Fowler's Toad		X						X
73	Marbled Salamander	X							X
74	Mud Salamander	X							X
75	Northern Cricket Frog	X							X
76	Northern Dusky Salamander	X							X
77	Northern Spring Peeper		X						X
78	Northern Two-lined Salamander		X						X
79	Pickerel Frog		X						X
80	Northern Red Salamander	X							X
81	Redback Salamander		X						X
82	Red-spotted Newt	X							X
83	Spotted Salamander		X						X
84	Upland Chorus Frog	X							X
85	Wood Frog	X							X
Fish									
86	Alewife	X					X		
87	American Eel	X				X			

	Species of Greatest Conservation Need	Status				Trend			
		Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
88	American Shad	X						X	
89	Atlantic Sturgeon	PE							
90	Blueback Herring	X					X		
91	Bowfin	X							X
92	Central Stoneroller	X							X
93	Greenside Darter	X							X
94	Hickory Shad	X						X	
95	Shortnosed Sturgeon	PE							
96	Silverjaw Minnow	X							X
97	Warmouth	X							X
Invertebrates									
98	A Copepod *Acanthocyclops Columbiensis*				X				X
99	A Copepod *Acanthocyclops Villosipes*				X				X
100	A Copepod *Attheyella (Canthocamptus)*				X				X
101	A Copepod *Attheyella (Mrazekiella) Illiniosensis*				X				X
102	A Copepod *Attheyella (Mrazekiella)*				X				X
103	A Copepod *Bryocamptus Hutchinsoni*				X				X
104	A Copepod *Bryocamptus Minutus*				X				X
105	A Copepod *Bryocamptus Nivalis*				X				X
106	A Copepod *Bryocamptus Zschokkei*				X				X
107	A Copepod *Diacyclops Harryi*				X				X
108	A Copepod *Diacyclops Nearcticus*				X				X
109	A Copepod *Eucyclops Agilis*				X				X
110	A Copepod *Macrocyclops Albidus*				X				X
111	A Copepod *Paracyclops Fimbriatus Chiltoni*				X				X
112	Alewife Floater				X				X
113	Appalachian Grizzled Skipper				X				X
114	Appalachian Spring Snail				X				X
115	Brook Floater				X				X
116	Crossline Skipper Butterfly				X				X
117	Dwarf Wedgemussel				X				X

Species of Greatest Conservation Need	Status				Trend			
	Low	Medium	Abundant	Unknown	Declining	Stable	Increasing	Unknown
118 Eastern Comma Butterfly				X				X
119 Eastern Pondmussel				X				X
120 Edward's Hairstreak				X				X
121 Emerald Spreadwing				X				X
122 Fine-lined Emerald				X				X
123 Frosted Elfin				X				X
124 Great Spangled Fritillary Butterfly				X				X
125 Green Floater				X				X
126 Grey Petaltail				X				X
127 Hay's Spring Amphipod				X				X
129 Kenk's Amphipod				X				X
130 Lilypad Forktail Damselfly				X				X
131 Little Glassywing Butterfly				X				X
132 Mocha Emerald Dragonfly				X				X
133 Monarch Butterfly				X				X
134 Mottled Duskywing				X				X
135 Pizzini's Cave Amphipod				X				X
136 Potomac Groundwater Amphipod				X				X
137 Question Mark Butterfly				X				X
138 Red Admiral Butterfly				X				X
139 Regal Fritillary Butterfly				X				X
140 Rock Creek Groundwater Amphipod				X				X
141 Sedge Sprite				X				X
142 Sphagnum Sprite				X				X
143 Spiny-foot Copepod				X				X
144 Tidewater Mucket				X				X
145 Tiger Spiketail Dragonfly				X				X
146 Triangle Floater				X				X
147 Unicorn Clubtail Dragonfly				X				X
148 Variegated Fritillary Butterfly				X				X
149 Yellow Lampmussel				X				X

Notes to table on following page

Notes:
  Low—population is imperiled or vulnerable
  Medium—population appears to be stable
  Abundant—population is over carrying capacity
  Unknown—population is undetermined
  PE—possibly extirpated

Sources for species status and trend data are located in Chapter 6—Conservation Actions—Species. All status and trend data for this table for the fish species of greatest conservation need was provided by Jon Siemien, Chief, Fisheries Research Branch, DC Fisheries and Wildlife Division.

Habitat Types and Conditions

One of the most exciting features of the District is that while it is a bustling metropolis, it also has a variety of vibrant natural areas ranging from urban landscapes with historic monuments and memorials to deep hardwood forests for birdwatching to rivers for fishing and boating. 13 identified habitat types are considered priority habitats for conservation.

Table 7. Priority Habitat Types

Habitat Types	
Terrestrial	Hardwood Forest
	Early successional/ Shrub-scrub/ Edge
	Grasslands/ Managed Meadows
	Urban Landscapes
Aquatic	Rivers and Streams
	Forested Wetlands, Riparian Woodlands, Floodplains
	Emergent Tidal Wetlands
	Emergent Non-tidal Wetlands
	Tidal Mudflats
	Vernal Pools
	Springs and Seeps
	Submerged Aquatic Vegetation
	Ponds and Pools

Habitat types are ordered based on the prioritization process, as described in Chapter 1. In sum, habitat types that house greater numbers of species in greatest conservation need, as well as a larger acreage of land are of greater conservation priority. The following Summary Chart lists the habitats in order of their priority:

Table 8. Status and Trend of Habitat Types

Habitat Type	Status				Trend			
	Excellent	Good	Fair	Poor	Decreasing	Stable	Increasing	Unknown
Terrestrial								
Hardwood Forests			X		X			
Grasslands/ Managed Meadows			X		X			
Early successional/ Shrub-scrub/ Edge			X		X			
Urban Landscapes		X					X	
Aquatic								
Rivers and Streams			X			X		
Emergent Non-tidal Wetlands			X		X			
Forested Wetlands/ Riparian Woodlands / Floodplains			X			X		
Emergent Tidal Wetlands			X				X	
Tidal Mudflats			X				X	
Springs and Seeps			X			X		
Submerged Aquatic Vegetation			X				X	
Vernal Pools			X		X			
Ponds and Pools			X			X		

Note: The source of habitat condition data and the description of the ranking process is located in Chapter 1—Approach.

Table 9. Habitat Types Prioritized

Rank	Habitat Type	# Species	Acreage
1	Rivers and Streams	62	~4645
2	Hardwood Forests	45	~6864
3	Emergent Non-tidal Wetlands	40	<500
4	Grasslands/ Managed Meadows	23	<1000
5	Forested Wetlands/ Riparian Woodlands/ Floodplains	22	<1000
6	Early successional/ Shrub-scrub/ Edge	19	<15000
7	Emergent Tidal Wetlands	12	<2000
8	Urban Landscapes	10	~24,000
9	Tidal Mudflats	10	<600
10	Springs and Seeps	10	<100
11	Submerged Aquatic Vegetation	8	<1000

12	Vernal Pools	7	<200
13	Ponds and Pools	6	<500

Figure 3.1 Priority Habitat Types for the District of Columbia
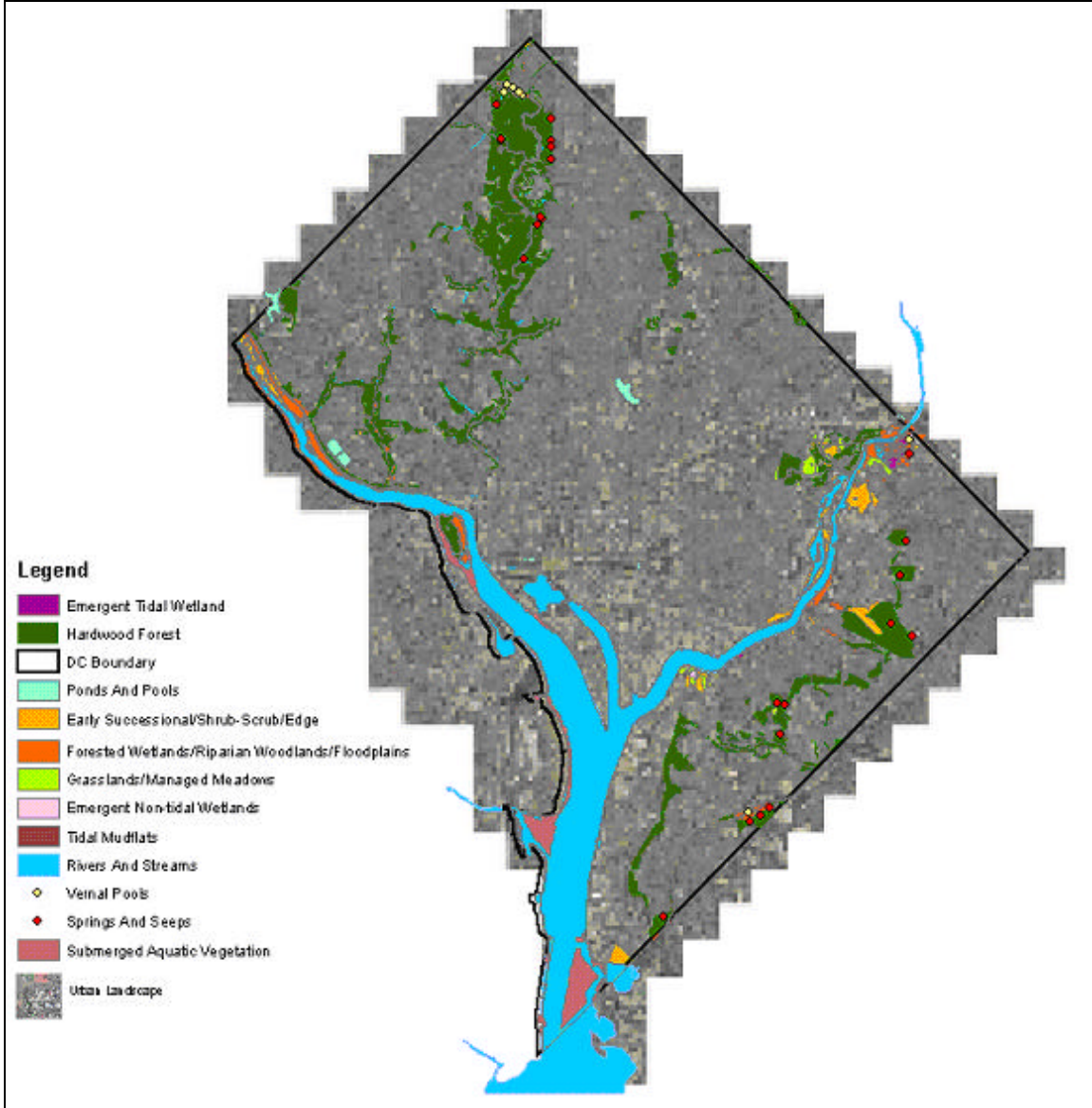
Terrestrial Habitats

Hardwood Forest

Hardwood forests house 45 species of greatest conservation need, making hardwood forests the second highest priority habitat. Five major types of hardwood forest are found within the District, including chestnut oak forests, mixed oak—beech forests, tulip poplar forests, loblolly pine—mixed oak forests, and Virginia pine—oak forests.

1. **Chestnut oak forests** occur on ridgetops, convex upper slopes, and south-facing slopes, and are often associated with the mid-Atlantic Piedmont. Soils found in these forests are rocky, well-drained, acidic, sandy loams with a poorly developed organic layer and bedrock close to or at the surface. A conservation concern of these types of forests is that surface runoff and erosion is common (TNC 1998).

   Dominant vegetation includes:
   - o   Canopy— Chestnut oak, Black gum
   - o   Sub-canopy— Serviceberry, Sassafras
   - o   Shrub layer— Blueberry, Black huckleberry
   - o   Herbaceous— sparse

2. **Mixed oak—beech forests** are mixed hardwood upland forests that occur on mesic to dry-mesic slopes or gentle gradients, primarily on or in close proximity to the mid-Atlantic Coastal Plain. Soils found in these forests are typically well-drained, acidic sandy loams, which may be derived from parent material of relatively greater fertility. This type of forest is of conservation concern because, for example, it has been mapped in Glover Archbold Park, which is a priority habitat location of this WAP, and the characteristics of the soil may play a role in the proliferation of non-native species at this site (TNC 1998).

   Dominant vegetation includes:
   - o   Canopy— Beech, White oak, Tulip poplar
   - o   Sub-canopy— American holly, flowering dogwood
   - o   Shrub layer— Maple-leaved viburnum
   - o   Herbaceous— Bellwort, Virginia creeper, Solomon's seal, Christmas fern

3. **Tulip poplar forests** occur along streams and on mesic, mid-slope to low-slope sites that have been cleared and/or cultivated. They have been found on areas mapped as Manor loam soils that are deep, well-drained and underlain by acidic rock. These types of forests could be of conservation concern because they are successional forests that follow cropping or clear-cut logging or other severe disturbances, including fire (TNC 1998).

   Dominant vegetation includes:
   - o   Canopy— Tulip poplar
   - o   Sub-canopy— Boxelder

> o   Shrub layer— Spicebush, Blackberry, Multiflora rose, Porcelain berry
> o   Herbaceous— Lesser celandine

4. **Loblolly pine—mixed oak forests** occur on mid to lower slopes on broad flats or in sheltered ravines, and are associated with the mid-Atlantic Coastal Plain. Soils within the District are well-drained to excessively drained gravelly sandy loams. This type of forest could be of conservation concern because it has a relatively high diversity of tree species (TNC 1998).

> Dominant vegetation includes:
> o   Canopy— diverse; no dominate species; species include Black cherry, Sweet gum, Post oak, Turkey oak, Willow oak, Loblolly pine
> o   Sub-canopy—
> o   Shrub layer—
> o   Herbaceous— sparse

5. **Virginia pine—oak forests** occur on middle to upper slope positions at elevations below 3,000 feet. Within the District, these forests usually occur on well-drained soils of hilltops. These types of forests could be of conservation concern because they were once common in 1977, but have now almost all succeeded to hardwood forests.

> Dominant vegetation includes:
> o   Canopy— Virginia pine, Oaks, Tulip poplar
> o   Sub-canopy— Oak
> o   Shrub layer— Maple-leaved viburnum
> o   Herbaceous— sparse

An overarching conservation concern of all hardwood forest habitats is changes to the composition and vegetation structure. Some species specialize in specific vertical vegetation structures so that changes to the structure creates habitat unfit for those species. For example, the Wood Thrush is a species of greatest conservation need that requires a well-developed subcanopy and midstory vegetation with a relatively open understory and decaying leaf litter (PIF 1999).

One cause of a change in a forest's vertical structure is overbrowsing of the understory by deer. In fact, overbrowsing is a serious conservation threat within the District. Currently Rock Creek Park is assessing the damage to the understory by deer overbrowsing and has produced an Internal Scoping Report. Overbrowsing may be a serious threat to hardwood forest habitat and may require the production of a deer management plan. DC Fisheries and Wildlife Division staff plans to partner with the National Park Service to address the threat of overbrowsing across the District.

Currently, overbrowsing is not one of the top five threats to hardwood forest habitats and hopefully through the National Park Service's efforts and the conservation actions of this WAP, deer overbrowsing will never become a higher-ranking threat. However, a high-

ranking threat in emergent tidal wetland habitats is goose overbrowsing. The Anacostia Watershed Society is working with the Patuxent Wildlife Research Center, the DC Fisheries and Wildlife Division, the DC Watershed Protection Division, the National Park Service, MD Department of Natural Resources and other agencies and organizations to address this threat.

Grasslands/ Managed Meadows

Grasslands are home to 23 species of greatest conservation need and are a habitat that is at risk within the District and surrounding region. Grasslands are composed of vegetation that does not mature into successional growth or shrubland. They are primarily composed of grasses and can only sometimes support scattered shrubs and trees. Managed meadows are natural areas that are similar in ecological structure to grasslands but are managed by agencies and organizations by practices such as mowing.

While the availability of grasslands declines, it appears to be one of the last remaining strongholds for the Grasshopper Sparrow in the northeast. Furthermore, species that rely on open grasslands for breeding are among the species with the highest rates of population decline such as the Bobolink (PIF 1999). Therefore, grassland species as well as their habitat, especially large patches of grasslands, are in need of conservation.

### Early Successional/ Shrub-scrub/ Edge

Early successional/ shrub-scrub/ edge habitats are home to 19 species of greatest conservation need. These habitats are habitats that have not matured into forest because of periodic natural or human disturbances. They are characterized by natural or semi-natural woody vegetation with aerial stems, generally less than six meters tall, with individuals or clumps not touching or interlocking. Both evergreen and deciduous species of true shrubs, young trees, and trees or shrubs are small or stunted because of environmental conditions. Shrubs dominate this habitat, with shrub canopy accounting for 25 to 100 percent of the cover. Shrub cover is generally greater than 25 percent when tree cover is less than 25 percent.

Some species depend on the type of vegetation that thrives in areas that have not matured into forest. For example, the American Woodcock is a species of greatest conservation need that prefers moist early successional habitat scattered with alder, dogwood, crab apple and hawthorn. It feeds at twilight or night by probing damp ground in fields or woods for earthworms, grubs, slugs and insects. Because of these specific habitat requirements, the American Woodcock serves as a good indicator species for early successional habitat suitable for many other species (PIF 2003).

Urban Landscapes

Urban landscapes are home to at least 10 species of greatest conservation need. After further research, more species are expected to be found using this habitat. Urban landscapes include both built and natural areas that are managed for human use. Usually

these areas are mowed, trimmed, experience a great deal of foot traffic, and are exposed to wind because they are cleared. These areas consist of the remaining land not identified under the other twelve habitats listed in this WAP, including golf courses, school campuses, backyards, cemeteries, land surrounding memorials and monuments, and non-vegetated areas such as roads, residential and commercial buildings, and parking lots. These areas are divided among the District's 8 wards, which would be equivalent to counties in a state.
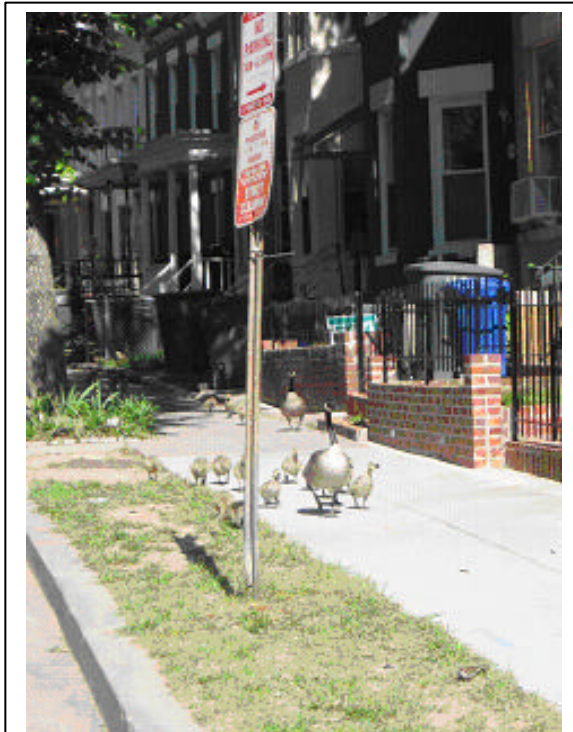
Canada geese adapting well to the urban setting. Canada goose management is a component of the DC Wildlife Action Plan.

While some urban landscapes are built space, they still provide habitat for wildlife and are important areas for conservation planning. Within the extremely urbanized setting, the natural areas could provide important wildlife habitat and migratory corridors. There are several options for transforming urban landscapes into habitat, including using native plants in landscaping, strategic mowing, limiting pesticides, turning off lights in buildings and educating the public as to keeping pets inside and as to the value of wildlife (CRBC 1999).

Because the District has a large acreage of urban landscapes, it has a responsibility for conserving species that specialize in urban habitats. For example, the District has a high responsibility for ensuring that the Chimney Swift maintains stable populations since it is a species that specializes in urban habitats.

Currently, conservation agencies and organizations within the District lack information regarding the species of greatest conservation need that use these areas. However, urban landscapes represent a large portion of the District's land use and have a high potential for providing habitat and management opportunities. Thus, a strategy of this WAP is to start the research and surveys that are necessary to develop the expertise on the wildlife component of these urban landscapes in order to identify impacted species of greatest conservation need and to determine the most effective conservation actions.

Aquatic Habitats

Rivers and Streams

The District is home to two rivers—the Potomac and Anacostia—and several streams. They provide habitat for 62 species of greatest conservation need, making it the highest priority habitat. All wildlife taxa utilize the rivers and streams in some way, whether it is

to drink, forage, breed, travel, or live. All life depends on water so the health of the District's rivers and streams affects all species of greatest conservation need. It is critical to have clean and healthy river and stream habitat.

They also perform many other ecological functions. They form natural corridors that connect otherwise isolated habitats. They connect the neighboring states to the District's habitats. They carry sediment and pollution downstream across borders. They are important for recreational activities such as fishing, swimming, wildlife observation, and boating and are aesthetic amenities for residential development and public open space. Drainage conveys urban waste and runoff from the land, especially during floods.

Vegetation (Ceanothus) along C&O Canal

However, the reliance on rivers and streams as conduits for stormwater and wastewater, as well as stream channelization and the alteration of the stream's watershed, has greatly diminished their ability to perform their functions. As a result, this habitat for wildlife faces erosion, degraded water quality and frequent flooding (CRBC 1999). Erosion and pollution are two of their greatest threats.

Emergent Non-tidal Wetlands

Emergent non-tidal wetlands are home to 40 species of greatest conservation need and the third highest priority habitat type. Emergent non-tidal wetlands are newly-formed wetlands that are not subject to tides (Environmental Technical Services Co. 1999). While this type of wetland does not support fish populations because it does not become inundated with water, it is habitat for invertebrate species that live in the substrate and the reptile, amphibian and the bird species that feed on those invertebrates.

Forested Wetlands / Riparian Woodlands / Floodplains

Together, forested wetlands, riparian woodlands and floodplains are home to 22 species in greatest conservation need.

1. **Forested wetlands** support vegetation with roots that are adapted to saturation during the growing season. Nationwide, forested wetlands account for the greatest amount of wetland loss and are experiencing changes in plant composition. The mid-Atlantic Coastal Plain accounts for nearly 7.4% of these wetlands. Between the 1950s and 1970s, nearly 2.5 million hectares of forested wetlands were lost. Much of this loss was due to the harvest of wetland forests or to filling or draining of forested wetlands for conversion to agriculture or urban development (PIF 1999).

   The Prothonotary Warbler is a breeding bird of greatest conservation need that inhabits mature forested wetlands of the Coastal Plain. They require a relatively low, open canopy, a high density of small stems, cavities, and prefer the flooded rather than drier areas. Because of these highly specific habitat requirements, they are a

good indicator species for permanently forested wetlands. Therefore, conserving enough habitat to support their populations would also provide enough habitat for other species of greatest conservation need such as the Yellow-throated Vireo (PIF 1999).

2. **Riparian woodlands** are woodlands on either side of rivers and streams. They create recreational activities such as fishing and camping (BLM 1999). These areas help purify the water by:
    - o   removing sediments,
    - o   reducing the risk of flooding,
    - o   reducing bank erosion, and
    - o   providing water, food and habitat for a diversity of plant and wildlife species

3. **Floodplains** are low plains adjacent to stream banks, rivers, lakes or oceans and are subject to temporary or irregular flooding (Floodplain Management Association 2005). Floodplains are shaped by the frequency and duration of flooding, by nutrient and sediment deposition, and by the permeability of the soil. Flooding usually occurs during early spring when the snow is melting or during times of unusually heavy rainfall. The flooding of the area is important for the plant and wildlife species that inhabit or utilize the floodplain. These areas are of conservation concern because when they are developed or disturbed, overflowing and flooding can occur on the banks (Twin Groves Museum in the Classroom 2000).

    Within the District, floodplains are associated with the mid-Atlantic Piedmont and the soils tend to be strongly acidic and moderately well-drained to somewhat poorly-drained Codorus silt loam with smaller deposits of sand and gravel. Woody debris typically covers 15% of the ground surface, whereas a leaf litter layer may be thin to absent. Floodplains within the District tend to be small with an average of about 30-40 acres (TNC 1998). The canopy cover is 50-90%, but the understory is more open than hardwood forests due to the frequent flooding (CRBC 1999).

    Dominant vegetation includes:
    - o   Canopy— Sycamore
    - o   Sub-canopy— Box elder
    - o   Shrub layer— Spicebush
    - o   Herbaceous— Garlic mustard, Jewelweed

Emergent Tidal Wetlands

Emergent tidal wetlands are home to 12 species of greatest conservation need. They are lands that are inundated by tidal waters. They can be seasonally, temporarily, and semi-permanently flooded. Emergent vegetation is important for water quality because it acts as a filter for sediment and other substances. Common plant species include wild rice, duck potato, American lotus, polyganum species, soft rush, pickerelweed, sedges,

bulrush, nuphar, common boneset, spikerush, wool-grass, spatterdock, swamp milkweed, and stiff march bedstraw (APG 2005).

More than 90% of the Anacostia River's historic wetlands have been destroyed or altered, due to land conversion, urban development and dredging and filling (AWRC 1991). The Wetlands Act of 1972 has been able to slow the trend wetland conversion across the country (PIF 1999). Locally, one of the top five threats to emergent tidal wetlands is overbrowsing by resident Canada Goose populations. The geese eat the wild rice and other native vegetation, which diminishes the habitat for other animal species and increases opportunities for non-native invasive plant species.

Vegetation (Baptisia) along the C&O Canal.

The Anacostia Watershed Society is working with the Patuxent Wildlife Research Center, the DC Fisheries and Wildlife Division, the DC Watershed Protection Division, the National Park Service, MD Department of Natural Resources and other agencies and organizations to address this threat. The National Park Service has begun work toward producing a goose management plan. However, management options in the District are limited because all wildlife is protected under the Water Pollution Control Act of 1984.

Tidal Mudflats

Tidal mudflats are home to 10 species of greatest conservation need. They are wetlands that occur between vegetated marsh and the water's edge and are alternately exposed and submerged by the tide. Tidal mudflats occur where wave energy is low and herbaceous vegetation covers less than 10% of the mud (FWC 2005). They are important for wildlife because they provide habitat and at the same time improve habitat quality by purifying the water. Many invertebrates live in the mud and provide food for birds and mammals when the tides are out (http://www.petalumawetlandspark.org/HTML/Station7.html).

Springs and Seeps

Springs and seeps of the District are a very important habitat because they are home to two endemic and one federally endangered species of greatest conservation need. The Hay's Spring amphipod is both endangered and endemic and Kenk's amphipod is endemic to Rock Creek. Springs and seeps within the District are required by several other species of greatest conservation need, particularly rare subterranean amphipods and copepods. A comprehensive inventory of groundwater invertebrate species within the District is needed to identify all of the species, threats, and conservation needs of this habitat, but resident expert opinion of the WAP Working Group expects such an inventory to reveal springs and seeps to remain a priority habitat.

Springs and seeps occur where groundwater flows to the surface. A spring has a concentrated flow, whereas a seep has a diffuse flow (CRBC 1999). Springs occur when the water table is higher than the ground surface and pressure forces the water out of the land (http://pasture.ecn.purdue.edu/~agenhtml/agen521/epadir/grndwtr/spring.html). They serve as a water source for almost every kind of wildlife species. The District's springs were once the best source of drinking water in the 1700s and 1800s. Today, those springs have disappeared due to the diversion of rainwater, direct piping into the sewers, filling or contamination (Pavek 2002).

Seeps are areas where groundwater continuously surfaces and flows down a slope. They support habitats made up of tiny mosses, lichens, ferns and flowering plants that cling to the surface of the slope (http://www.nps.gov/dewa/pphtml/subnaturalfeatures21.html).

Submerged Aquatic Vegetation

Submerged aquatic vegetation (SAV) in the District is a very important habitat type for both resident and catadromous fish. It is utilized by both aquatic and terrestrial species, of which eight are on our list of species of greatest conservation need. SAV provides food and habitat for many aquatic species, as well as helps to prevent erosion and sedimentation. Many species depend upon SAV for foraging or spending their juvenile life stages. SAV is decreasing throughout the District's waterways, which has a negative impact on both aquatic habitats and species of greatest conservation need (http://www.chesapeakebay.net/info/baygras.cfm).

This habitat is made up of permanently submerged vegetation and can be a mix of from one or two species in small patches, to seven to ten species in larger patches; the large mat had seven species in 2003. The largest patch of SAV in the District is located just upstream of the Woodrow Wilson Bridge. Species commonly found in the SAV beds in the District include *Hydrilla verticillata, Ceratophyllum demersum*, *Myriophyllum spicatum*, *Vallisneria americana*, *Heteranthera dubia*, and *Najas minor, Najas guadalupensis, and Myriophyllum spicatum*.

The SAV beds in the District are constantly changing, both in size and location, in response to several environmental variables all related to water quality. This prime aquatic habitat is constantly threatened by poor water quality related to high suspended solid loads because these solids block light from penetrating to the plants. During dry years, or during years when solids loading is high before or after the active growing season, the SAV can become established. During years when the loadings are high during the growing season however the plants either do not develop to the stage where seeds or shoots are not produced, or can die off entirely. Once the SAV density declines, more river, stream and pond bottom is exposed to further erosion and resuspension of sediment. Depending on the amount of precipitation in any one year then, our SAV beds can either flourish or decline. In 2002 there were 699 acres of SAV and after a record wet year in 2003 the acreage was down to 24 acres.

Presently the District is actively monitoring its SAV beds and plans are being developed to try test plantings. Potential partners include the Earth Conservation Corp, National Park Service, and the Anacostia Watershed Society in planting efforts. Enhanced SAV populations could not only help stabilize river, stream and pond bottom, but also enhance essential habitat for our aquatic and terrestrial species with the greatest conservation need.

Wood frog egg mass from an important vernal pool amphibian breeding habitat.

Vernal Pools

Vernal pools are seasonal bodies of water that flood each year for a few months during the spring and dry up by the end of summer. Because they are not permanently flooded, they do not support fish populations. Instead, they provide important breeding habitat for many species of amphibians. Some species, such as the spotted salamander and wood frog, are obligate vernal pool species, meaning that they require vernal pools to breed (http://www.nhaudubon.org/conservation/vernal.htm).

Vernal pool habitat in the District is by definition a transitory habitat, but even while transitory it provides habitat for seven of the District's species of greatest conservation need. The habitat is most often found in woodland areas but some are also found in the rocky floodplain area of the Potomac River.

Threats encountered by local vernal pool habitats can be as varied as surface runoff contamination caused by nearby development, or poaching of species which inhabit these habitats. Threats also include changes in nearby land use, or climatological changes, which can alter the hydrology of the surrounding area. Since vernal pool habitat is so reliant on an area's hydrology, if the hydrology changes the habitat can either be disrupted where it will no longer support its previous species diversity or it may totally disappear. In an urban area like the District, developmental pressures are constantly threatening the continuation of these marginalized habitats.

Spotted salamander egg mass in important amphibian vernal pool breeding habitat.

Vernal pool management is new to the DC Fisheries and Wildlife Division. Therefore, partnerships will be critical for guidance in the inventory and management of priority habitats, with an eye on restoration and even the creation of new habitats. Potential partners include the National Park Service and the US Fish and Wildlife Service. Over the next five years, the DC Fisheries and Wildlife Division hopes to develop a permanent system for tracking these habitats in the District. Currently, Rock Creek Park conducts monitoring surveys of vernal pools and amphibian egg masses occurring within the park.

Ponds and Pools

Pond and pool habitat in the District, while a relatively minor habitat type, supports six species of greatest conservation need. These habitats consist of small impoundments which are not presently actively surveyed or managed by the DC Fisheries and Wildlife Division. They often contain some submerged aquatic vegetation, another priority habitat, and can potentially support bird, fish, invertebrate, amphibian, reptilian, and mammalian species.

The pond and pool habitats are endangered mainly from threats which are directly or indirectly related to development. Nearby development can directly effect surface runoff contamination into the systems, and if runoff is extreme there can also be erosion and erosional deposition of sediments into the habitats. As with any system supporting SAV, erosional deposition generally leads to increased suspended solids in the water column and thus decreased light penetration. With a decrease in light penetration there is a decreased chance for SAV to become established or be maintained.

Because the District is highly urbanized, ponds and pools have a high potential for providing habitat to many aquatic species of greatest conservation need within urbanized areas. However, pond and pool habitat, like that of vernal pools, is not currently surveyed or managed by the DC Fisheries and Wildlife Division. Therefore, partnerships, especially the National Park Service and the US Fish and Wildlife Service, are essential for guidance in inventory and management of pond and pool habitats, with an eye on restoration and even creation of new pond and pool habitats.

Priority Habitat Locations

Below is a list of all priority habitats locations divided into the habitat types listed above. The selection process of priority habitat locations was explained in Chapter 1.

Terrestrial Habitats

Hardwood Forests

- o Glover Archbold Park
- o National Arboretum
- o Kenilworth Park (River Trail)
- o Shepherd Parkway
- o St. Elizabeth Hospital
- o Catholic University
- o Oxon Cove Park
- o Rock Creek Park
- o Fort Circle Parks
- o Oxon Run Parkway
- o Suitland Parkway
- o Veteran's Hospital
- o National Zoo
- o Lincoln Wetland Complex (between Nat. Arboretum & Anacostia Park)

Grasslands / Managed Meadows

- o Anacostia Park
- o Oxon Run Parkway

- o Fort Circle Parks
- o Kenilworth Park
- o National Arboretum
- o Oxon Cove

- o Poplar Point
- o Rock Creek Park
- o Veteran's Hospital area

Early Successional / Shrub-scrub/ Edge

- o Kingman Island
- o Poplar Point
- o Fort Dupont (along Old Golf Course
- o Anacostia Park (East Bank)

- o National Arboretum
- o Kenilworth Aquatic Gardens
- o Fort Lincoln
- o Right of Ways

Urban Landscapes

- o The National Mall
- o Anacostia Park
- o National Arboretum
- o Hains Point Golf Course

- o Cemeteries
- o School campuses
- o Langston Golf Course
- o Wards 1-8

Aquatic Habitats

Rivers and Streams

- o Potomac River
- o Anacostia River
- o Rock Creek and tributaries
- o Oxon Run

- o Hickey Run
- o Fort Dupont
- o Pope's Branch
- o Watts Branch

Emergent Non-tidal Wetlands

- o Poplar Point
- o Lincoln Wetland Complex
- o National Arboretum
- o Kenilworth Aquatic Gardens

- o Oxon Run Parkway
- o Fort Dupont
- o C&O Canal

Forested Wetlands / Riparian Woodlands / Floodplains

- o Watt's Branch
- o Oxon Run Parkway
- o Oxon Cove
- o Kenilworth Aquatic Gardens

- o Kingman Island
- o National Arboretum
- o Anacostia Park
- o C&O Canal

o   Rock Creek Park
o   Lincoln Wetland Complex

o   Theodore Roosevelt Island

Emergent Tidal Wetlands

o   Anacostia River
o   Kenilworth Aquatic Gardens

o   Kingman Island
o   Theodore Roosevelt Island

Tidal Mudflats

o   Anacostia Park
o   Kenilworth Marsh
o   Kingman Island

o   Oxon Cove
o   Theodore Roosevelt Island

Springs and Seeps

o   Rock Creek Park
o   Oxon Run Parkway

o   Fort Circle sites
o   National Arboretum

Submerged Aquatic Vegetation

o   Potomac River
o   Anacostia River
o   Kenilworth Aquatic Gardens

Vernal Pools

o   Kenilworth Aquatic Gardens
o   Fort Dupont
o   National Arboretum
o   Rock Creek National Park

o   Oxon Run Parkway
o   Heritage Island
o   C&O Canal

Ponds and Pools

o   McMillan Reservoir
o   Kenilworth Aquatic Gardens
o   National Arboretum
o   Soldier's/ Veteran's home
o   Constitution Gardens

o   Lincoln Wetland Complex
o   Rock Creek Cemetery
o   Del Carlia Reservoir
o   Langston Golf Course