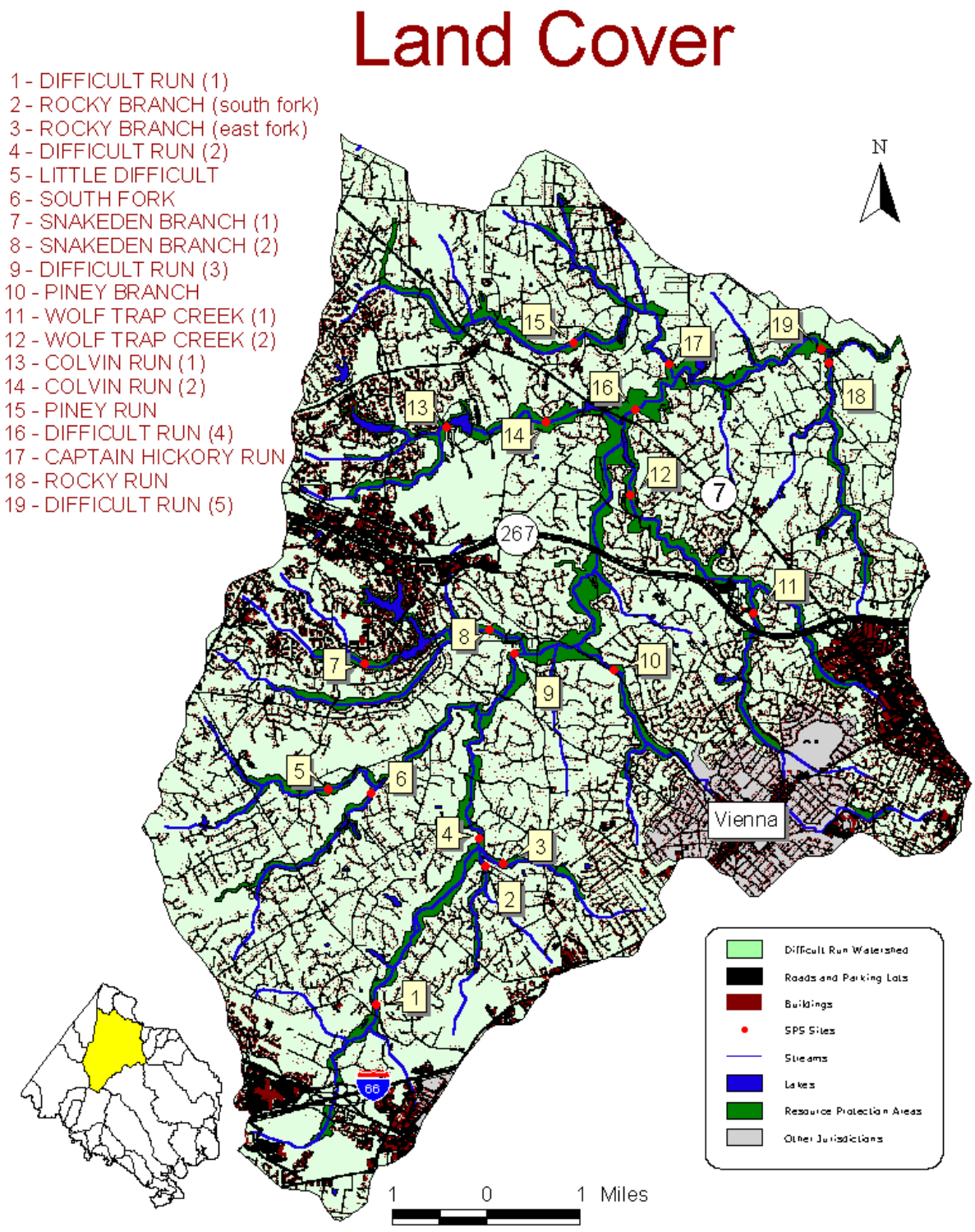
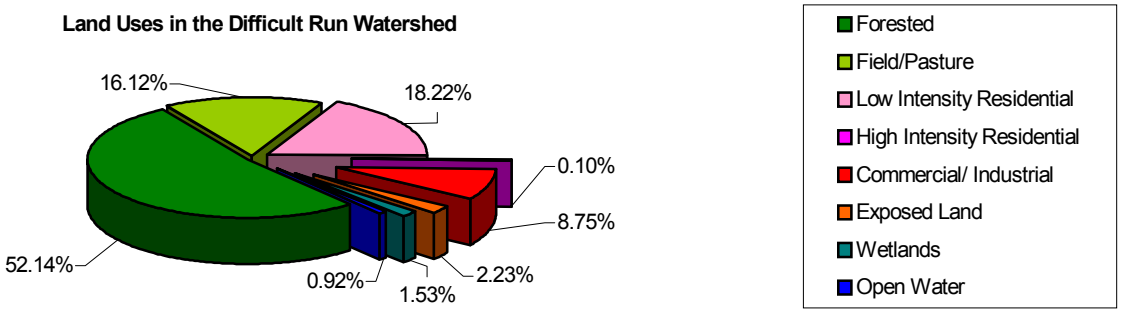
DIFFICULT RUN WATERSHED SUMMARY


Land Cover
1 - DIFFICULT RUN (1)
2 - ROCKY BRANCH (south fork)
3 - ROCKY BRANCH (east fork)
4 - DIFFICULT RUN (2)
5 - LITTLE DIFFICULT
6 - SOUTH FORK
7 - SNAKEDEN BRANCH (1)
8 - SNAKEDEN BRANCH (2)
9 - DIFFICULT RUN (3)
10 - PINEY BRANCH
11 - WOLF TRAP CREEK (1)
12 - WOLF TRAP CREEK (2)
13 - COLVIN RUN (1)
14 - COLVIN RUN (2)
15 - PINEY RUN
16 - DIFFICULT RUN (4)
17 - CAPTAIN HICKORY RUN
18 - ROCKY RUN
19 - DIFFICULT RUN (5)
N
Vienna
267
7
66
Difficult Run Watershed
Roads and Parking Lots
Buildings
SPS Sites
Streams
Lakes
Resource Protection Areas
Other Jurisdictions
1 0 1 Miles

CHAPTER 3

Watershed Description

Difficult Run is the largest watershed contained within the County, with an area of just over 58 square miles. The watershed lies entirely within the Piedmont physiographic province and is characterized by rolling hills and rough terrain, commonly with slopes of 10% or more. Slightly over 5% of the watershed area is not under County jurisdiction including the City of Fairfax, the Town of Vienna, and the U.S. Government lands within Great Falls Park and the Wolf Trap Farm Park for the Performing Arts. The watershed also contains several large impoundments including Lakes Audubon (33 acres), Thoreau (42 acres), Anne (28 acres) and Fairfax (21 acres). Other impoundments include Fox, Timber, Spring, Woodside and Newport lakes, and a variety of small regional ponds.



Development levels vary widely throughout the watershed. With the gathering of small headwater systems near the Fairfax County Government Center, the City of Fairfax, and the major interchange of Routes 50 and 66, Difficult Run begins its journey to the Potomac River. Over the next 17 miles of its length, the system is influenced by a diverse group of tributary systems that reflect a wide array of subwatershed conditions, ranging from forested basins to highly developed urban environments.

Streambank erosion was common at many locations in the Difficult Run watershed.

The system's first two major tributaries flow from areas where the intensity of development is moderate to low. The first of these, Rocky Branch, flows from the east and drains a region that includes Oakton, an area with levels of imperviousness ranging from 15 to 20%. In contrast, the Little Difficult Run drainage to the west includes many multi-acre residential lots spread throughout a subwatershed that, on the whole, has imperviousness levels that are still under 10%.

Further downstream, Difficult Run picks up tributary inputs from intensively developed regions with levels of imperviousness over 20%. Flowing from the west, Snakeden Branch and Colvin Run begin in the urbanized area of Reston and then meander through moderate-density residential communities. Similarly, Piney Branch and Wolf Trap Creek empty

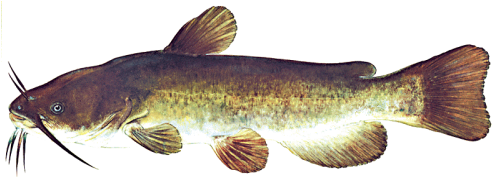
into Difficult Run in areas of low-intensity development but are generated from headwater systems that drain the highly developed urban/suburban expanse of Vienna and Tyson's Corner. The Dulles Toll Road (Route 267) bisects the watershed at this point, crossing over the mainstem on its way between major urban centers.

Before reaching its confluence with the Potomac River, Difficult Run receives the input of two other major tributary systems, Captain Hickory Run (and its own major tributary, Piney Run) and Rocky Run. Each of these drain moderately developed areas containing large expanses of forest cover interspersed with low-density communities comprised of multi-acre lots. Levels of imperviousness within these subwatersheds range between 10 and 15%.

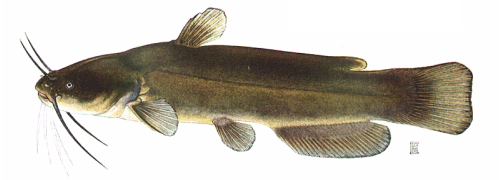
Captain Hickory Run, one of the highest quality tributaries in the County.

The lowermost section of Difficult Run is sheltered within Difficult Run Stream Valley Park, a protected area adjacent to Great Falls National Park.

Midge Larvae
Family *Chironomidae*
Habitat Classification: burrowers
Feeding Group: collector-gatherers, predators
Tolerance: moderate - tolerant
The Midge larvae are some of the most resilient aquatic insects sampled. The chironomids were the second most common macroinvertebrate sampled, with the aquatic worms being the most common. The bright red chironomids are hemoglobin rich which allows them to thrive in systems with low dissolved oxygen.



Brown Bullhead
Ameiurus nebulosus
Size: to 12 inches
Habitat: ponds, impoundments, pools and sluggish streams
Feeding Group: omnivorous
Tolerance: tolerant
This hardy fish is able to breathe air by "gulping," using its swim bladder as a crude lung. It can thus tolerate high water temperatures, which deplete the oxygen. It uses its "whiskers" as taste organs to find food in dark, murky waters. Some live to be 9 years old.



Yellow Bullhead
Ameiurus natalis
Size: to 13 inches
Habitat: pools of streams and rivers, ponds and lakes
Feeding Group: omnivorous
Tolerance: tolerant
This species assocites with cover, often dense vegetation. Spawning occurs in shallow circular nests excavated near cover or in open settings, in calm water. It is native to Virginia waters.

Longear Sunfish
Lepomis megalotis
Size: to 6 inches
Habitat: warmwater ponds, pools of streams and rivers
Feeding Group: invertivore
Tolerance: intolerant
The breeding male Longear is one of Virginia's most brilliantly colored sunfish. This sunfish feeds on aquatic and terrestrial insects. It is native to the Great Lakes and Mississippi Basin and has been introduced elsewhere.

DATA SUMMARY

Stream Name and Site Code	Composite: Site Condition Rating	Environmental Variables: Index of Biotic Integrity	Habitat Score	Fish Taxa Richness	Current Percent Impervious Surfaces	Projected Percent Impervious Surfaces
1 Difficult Run 1 (DFDF01)	Fair	Fair	Poor	High	21.9	46
2 Rocky Branch south (DFRB02)	Good	Excellent	Poor	High	12.2	20
3 Rocky Branch east (DFRB01)	Fair	Fair	Poor	High	16.0	18
4 Difficult Run 2 (DFDF02)	Poor	Poor	Poor	High	16.2	35
5 Little Difficult (DFLD01)	Fair	Good	Poor	Moderate	8.6	17
6 South Fork (DFSF01)	Poor	Poor	Poor	Moderate	8.9	15
7 Snakeden Branch 1 (DFSB01)	Very Poor	Very Poor	Very Poor	High	27.4	45
8 Snakedan Branch 2 (DFSB02)	Fair	Good	Good	Moderate	24.1	46
9 Difficult Run 3 (DFDF03)	Good	Fair	Fair	Moderate	12.4	23
10 Piney Branch (DFPB01)	Very Poor	Poor	Poor	Moderate	22.7	34
11 Wolftrap Creek 1 (DFWC01)	Poor	Poor	Fair	Low	24.8	41
12 Wolftrap Creek 2 (DFWC02)	Very Poor	Poor	Very Poor	Moderate	25.2	36
13 Colvin Run 1 (DFCR01)	Poor	Good	Very Poor	Moderate	27.0	48
14 Colvin Run 2 (DFCR02)	Poor	Poor	Poor	High	20.9	39
15 Piney Run (DFPR01)	Fair	Good	Poor	Low	13.3	22
16 Difficult Run 4 (DFDF04)	Fair	Good	Poor	Moderate	17.0	29
17 Captain Hickory (DFCH01)	Excellent	Good	Excellent	High	11.0	19
18 Rocky Run (DFRR01)	Good	Poor	Good	Moderate	14.7	21
19 Difficult Run 5 (DFDF05)	Good	Good	Fair	Moderate	15.7	27

Difficult Run Fish Species List

Common Name	Number of Sites Where Species Occurred (19 Total Sites)	Common Name	Number of Sites Where Species Occurred (19 Total Sites)
Blacknose Dace	19	Margined Madtom	8
Creek Chub	19	Yellow Bullhead	7
Tessellated Darter	18	Green Sunfish	6
White Sucker	18	Redbreast Sunfish	4
American Eel	17	Spottail Shiner	3
Rosyside dace	16	Fathead Minnow	2
Longnose Dace	14	Pumpkinseed	2
Central Stoneroller	13	Brown Bullhead	1
Common Shiner	13	Eastern Mudminnow	1
Bluegill	12	Fallfish	1
Cutlips Minnow	12	Fantail Darter	1
Satinfin Shiner	12	Golden Shiner	1
Swallowtail Shiner	10	Longear Sunfish	1
Largemouth Bass	9	Warmouth	1
Northern Hogsucker	9		

CHAPTER 3

Watershed Condition Summary

More so than perhaps any other watershed in the County, the Difficult Run drainage exhibits an extremely wide range of biological, habitat and land use conditions.

A total of 29 fish species were found within the watershed. Fish community assemblages at sampling locations generally exhibited taxa richness values in the moderate range, with only 2 of the 19 sampling sites scoring in the low category. On average, fish communities in the system were more diverse than many of the other County watersheds.

Overall rankings of benthic macroinvertebrate communities exhibited considerable variability throughout the watershed. Taxa richness, one component of the IBI, showed a similar pattern, with scores ranging from a low of 3 taxa in the upper Snakeden Branch (above Lake Audubon) to a high of 18 taxa in the south fork of Rocky Branch. Only 4 sample locations yielded diversity ratings that corresponded to those found at reference sites, and most communities were dominated by tolerant oligochaetes (aquatic worms), with tolerant individuals comprising 95% of the sample obtained from Piney Branch.

Habitat ratings were generally low throughout the watershed, with many systems ranking in the poor category. Two notable exceptions to this pattern were Captain Hickory Run and Rocky Run, both lightly developed drainages close to the mouth of Difficult Run. Of the 10 visually assessed components of the RBP score, sediment deposition and bank stability ratings were consistently low systemwide, reflecting the impact of stream flow volumes.

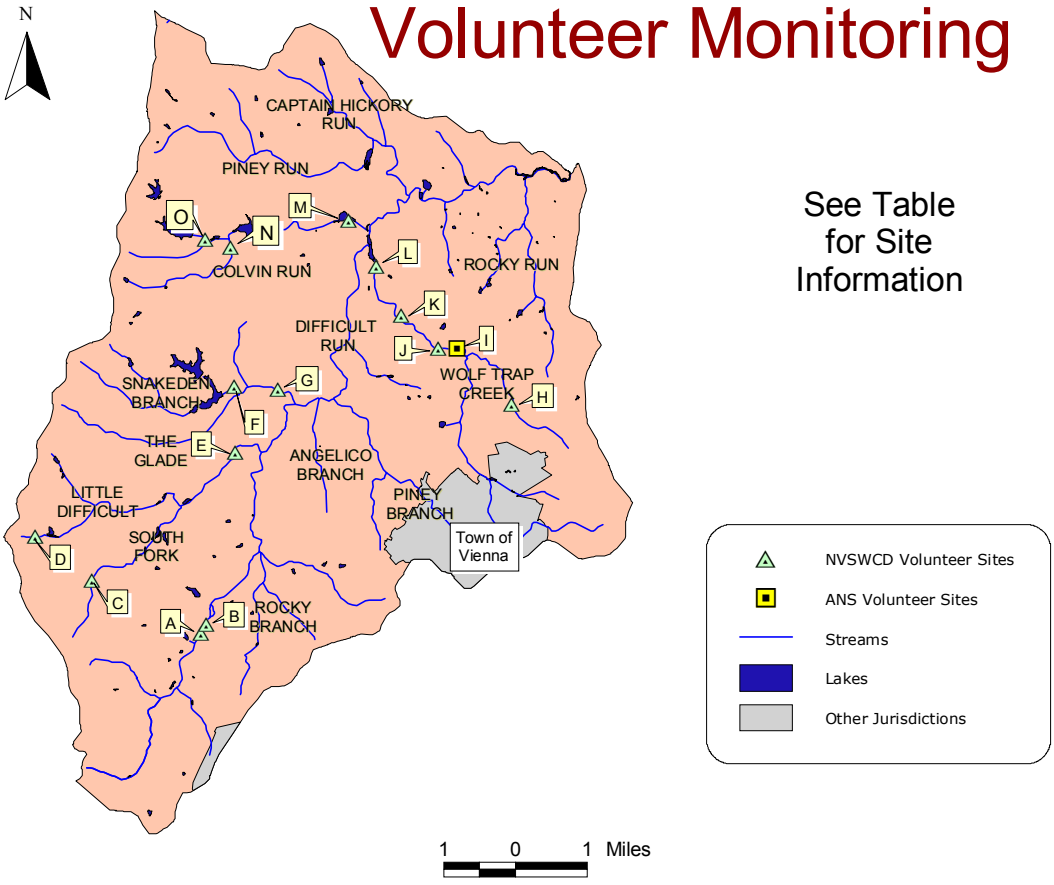
Development intensity throughout the watershed is highly variable as well, ranging from 8.2 to 27.4%, with the ultimate composite ratings reflecting this pattern. Several subwatersheds are in poor or very poor condition, with the lowest composite ratings seen in Snakeden Branch, Piney Branch and Wolftrap Creek, each a drainage with high impervious cover values and correspondingly low biological and habitat ratings. On the other end of the spectrum, Captain Hickory Run and Rocky Run drain regions of low- to moderate-intensity development and exhibit high levels of biological integrity. To a lesser extent, the same is true of Piney and Little Difficult Runs and of both the south and east forks of Rocky Branch.

These ratings seem to indicate that the watershed has been degraded, especially in localized areas, but overall still supports and maintains fairly healthy aquatic communities. More importantly, the watershed contains a variety of individual subwatersheds that remain of very high quality, a situation that is likely reflected in the mainstem environment itself, which still maintains some areas of high biological and habitat integrity, especially in its downstream reaches.

CHAPTER 3

Volunteer Data Summary

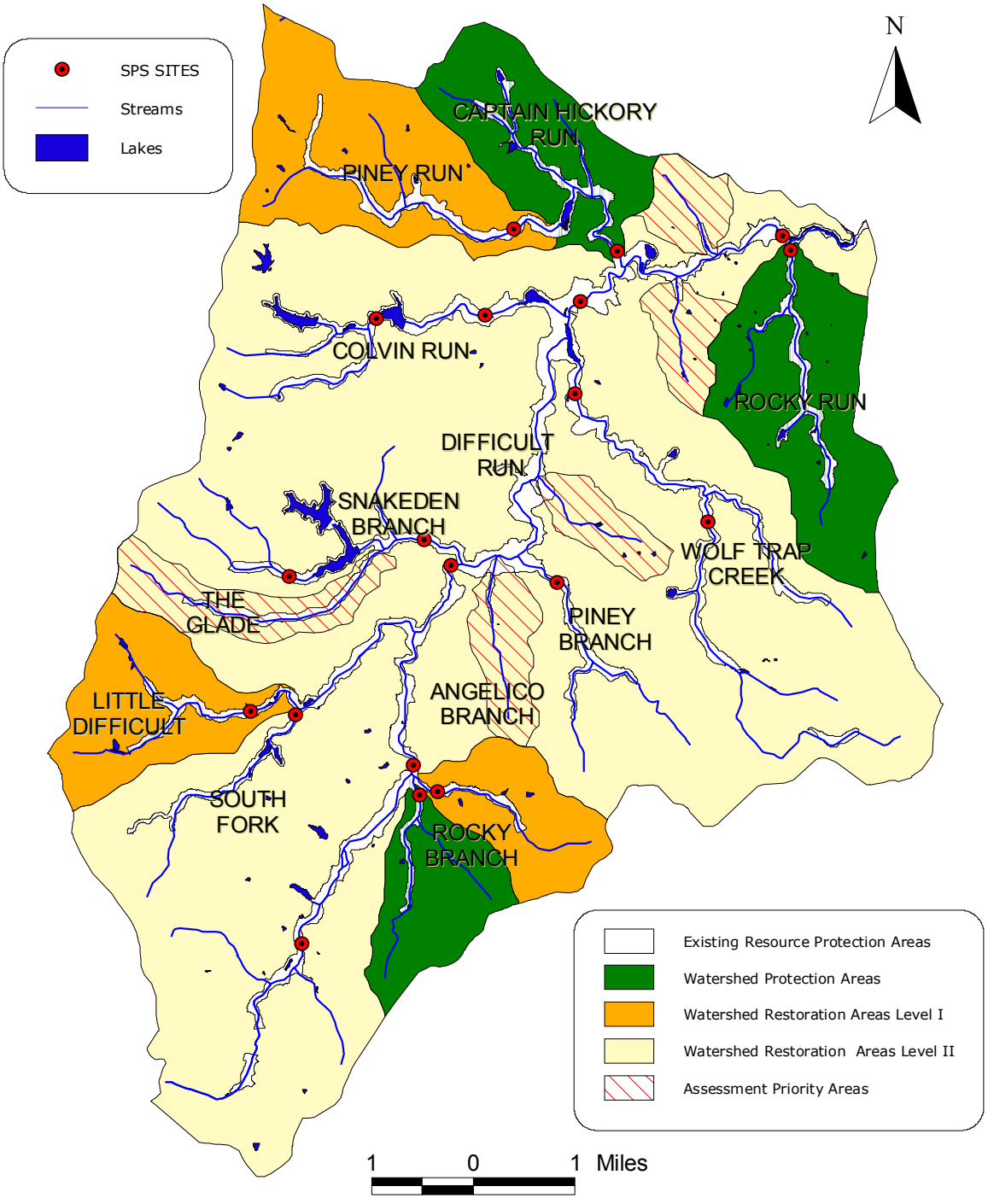
The Difficult Run Watershed currently has 15 active volunteer monitoring stations. The Northern Virginia Soil and Water Conservation District (NVSWCD) coordinates 14 of these, half of which are new additions to the program this year and have been sampled only once. The remaining site, located on Wolftrap Creek in Wolftrap Farm Park, is monitored by the Audubon Naturalist Society (ANS).



Results from the volunteer data show a wide range of water quality in the watershed as did the SPS study. The volunteer data generally supports the findings of SPS with most of the watershed in the "fair" category. Exceptions to this are the sites along Wolftrap Creek, which have shown repeated water quality ratings in the "good" range and the presence of such sensitive taxa as mayflies and stoneflies. Data from the ANS site on Wolftrap Creek also show the repeated presence of mayfly larvae. The repeated discovery of these sensitive taxa warrants future investigation of this tributary as part of an ongoing SPS program. If conditions of high biodiversity and a healthy benthic community are subsequently identified, alternative management strategies for that system may be recommended.

Letter Code	Site Code	# times sampled	Last sampled	WQR (SOS only)	Trends noted
A	DR26	1	9/10/00	Excellent	Too few samples
B	DR25	1	10/23/00	Fair	Too few samples
C	DR24	1	7/1/00	Fair	Too few samples
D	DR22	1	7/14/00	Poor	Too few samples
E	DR23	1	8/3/00	Good	Too few samples
F	DR11	2	11/26/99	Fair	Too few samples
G	DR03	8	3/25/00	Fair	Fair in early Spring, otherwise Good/Excellent
H	DR05	9	7/30/00	Fair	Poor in late Fall - Spring, otherwise Fair
I	012	4	7/19/99	N/A	Some mayfly larvae, otherwise moderately tolerant taxa
J	DR08	5	7/8/00	Excellent	Fair/Poor in late Fall - Winter, otherwise Good/Excellent
K	DR09	6	10/12/00	Good	generally Excellent
L	DR06	5	8/12/00	Fair	generally Fair
M	DR18	2	8/20/00	Good	Too few samples
N	DR27	1	11/5/00	Poor	Too few samples
O	DR20	2	10/22/00	Poor	Too few samples, but both were Poor

Management


SPS SITES
Streams
Lakes
N
CAPTAIN HICKORY RUN
PINEY RUN
COLVIN RUN
ROCKY RUN
DIFFICULT RUN
SNAKEDEN BRANCH
WOLF TRAP CREEK
THE GLADE
PINEY BRANCH
ANGELICO BRANCH
LITTLE DIFFICULT
SOUTH FORK
ROCKY BRANCH
Existing Resource Protection Areas
Watershed Protection Areas
Watershed Restoration Areas Level I
Watershed Restoration Areas Level II
Assessment Priority Areas
1 0 1 Miles

CHAPTER 3

Management Category Description

The Difficult Run watershed is highly diverse in land use and biological condition and, as such, requires an equally diverse approach in its management. Rocky Run and Captain Hickory Run are designated as protection areas due to their high biological and habitat quality. Although the south fork of Rocky Branch received a high rating overall and is similarly designated as a Watershed Protection Area, its poor habitat condition suggests the need for active management that focuses on restoration of instream habitat quality and the development of effective stormwater controls that minimize further degradation. Further study is also needed in the Rocky Run subwatershed to identify and mitigate the factors responsible for the poor condition of its benthic community.

Little Difficult Run and the east fork of Rocky Branch are categorized as priority Watershed Restoration Level I Areas. Piney Run falls into this category as well but is of special concern due to its potential influence on Captain Hickory Run, the system into which it flows. In all three watersheds, management should focus on the instream environment since all received poor scores in the habitat category. Such efforts should be monitored for their impact on the aquatic insect and fish communities of each respective system.

The remaining portions of the watershed are classified as Watershed Restoration Level II Areas. Issues of greatest concern include the system headwaters in the southern extent of the watershed and the urban centers of Reston, Vienna, and Tysons Corner. Stormwater management controls, through retrofitting, maintenance, or installation of new facilities, should be implemented where feasible. Such an approach would have the greatest potential for enhancement of conditions in downstream environments.

As is the case countywide, all five mainstem sites remain classified as Watershed Restoration Level II Areas due to the cumulative impacts of tributary conditions on these areas. However, the three lowermost mainstem sampling sites already rank as Good or Fair in overall site condition, a situation that should elevate the priority of the entire drainage relative to other watersheds in the County. Implementing strategies that focus on tributary systems first, an approach that is applicable countywide, becomes especially important. The first step in the process should be an expansion of the stream monitoring program to include those subwatersheds specified as Assessment Priority Areas. Due to the scale of this study, there were inevitable gaps in our coverage of the County's streams. Volunteer monitoring of headwater streams in these areas could aid in future assessments of the watershed.

CHAPTER 3

OTHER INITIATIVES

The Difficult Run Community Conservancy

The Difficult Run Community Conservancy is an organization of citizens interested in the Difficult Run stream and watershed with the following goals:

- Promote recognition of Difficult Run as a living system.
- Increase protection of, and public access to, Difficult Run Stream Valley corridor.
- Educate the public and members about issues in Difficult Run.
- Encourage and provide stewardship opportunities.
- Promote community involvement.
- Provide a communication network about issues concerning the watershed.

The Difficult Run Community Conservancy is a new organization that anticipates working with homeowners associations, other organizations and local government to improve, conserve and protect the natural resources of the Difficult Run watershed.