

TABLE OF CONTENTS

Shenandoah National Park: Fish In Sensitive Habitats Project Final Report (Four Volumes)

Contents of Volume I

Page 1 **Contents of Volumes II, III, and IV and the available CD-ROM**

Page 3 **Abstract**

Page 5 **Executive Summary**

Prepared by Arthur J. Bulger
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

C. Andrew Dolloff
Dept. of Fisheries and Wildlife Sciences,
Virginia Tech, Blacksburg, Virginia 24061-0321.

Page 17 **Chapter 1 - Project Overview and Summary of Results**

Prepared by Arthur J. Bulger and Bernard J. Cosby
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

Page 51 **Chapter 2 - Application of Research Findings for Resource Management in
Shenandoah national Park Using the MAGIC model**

Prepared by Bernard J. Cosby
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

Page 73 **Appendix I - Maps of the SNP:FISH Catchments
Catchment Boundaries, Stream Networks, Sampling Sites
Distributions of Vegetation and Bedrock Geology**

Prepared by Rick Webb
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

Contents of Volume II

Page 1 Chapter 3 - Synoptic Stream Water Chemistry

Prepared by Rick Webb
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

Page 51 Chapter 4 - Discharge and Water Chemistry at the Three Intensive Sites

Prepared by Keith N. Eshleman
University of Maryland, Center for Environmental Sciences
Appalachian Laboratory
Frostburg, MD 21532

Kenneth E. Hyer
Department of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

Page 93 Appendix I - Watershed and Stream-Sampling Site Information

Prepared by Rick Webb
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

Page 119 Appendix II - Analysis Methods and Data

Prepared by Rick Webb
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903

Contents of Volume III

Page 1 **Chapter 5A - Influence of Water Quality and Physical Habitat on Brook Char and Blacknose Dace in Three Streams with Different Acid Neutralizing Capacities in Shenandoah National Park, Virginia**

Prepared by C. Andrew Dolloff and Kurt R. Newman
Dept. of Fisheries and Wildlife Sciences,
Virginia Tech, Blacksburg, Virginia 24061-0321.

Page 33 **Chapter 5B - Condition, Production, and Population Dynamics of Brook Char and Blacknose Dace in Acid-Sensitive Shenandoah National Park Watersheds**

Prepared by C. Andrew Dolloff and Kurt R. Newman
Dept. of Fisheries and Wildlife Sciences,
Virginia Tech, Blacksburg, Virginia 24061-0321

Page 73 **Chapter 5C - Response of Brook Char (*Salvelinus fontinalis*), and Blacknose Dace (*Rhinichthys atratulus*) to Acidification in a Laboratory Stream**

Prepared by C. Andrew Dolloff and Kurt R. Newman
Dept. of Fisheries and Wildlife Sciences,
Virginia Tech, Blacksburg, Virginia 24061-0321

Page 91 **Chapter 5D - Extensive Inventory of Physical Habitat and Fish Populations in Five Streams with Different Acid Neutralizing Capacities in Shenandoah National Park, Virginia**

Prepared by C. Andrew Dolloff and Martin K. Underwood
Dept. of Fisheries and Wildlife Sciences,
Virginia Tech, Blacksburg, Virginia 24061-0321

Contents of Volume IV

- Page 1** **Chapter 6A - Susceptibility of the Early Life Stages of Brook Trout, *Salvelinus fontinalis*, and Adult Blacknose Dace, *Rhinichthys atratulus*, to Acidification in Shenandoah National Park**
- Prepared by S.E. MacAvoy and A.J. Bulger
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903
- Page 43** **Chapter 6B - Susceptibility of Blacknose Dace, *Rhinichthys atratulus*, to Acidification in Shenandoah National Park**
- Prepared by T. Dennis and A.J. Bulger
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903
- Page 95** **Chapter 6C - Stream Chemistry and Fish Species Richness in Shenandoah National Park**
- Prepared by A.J. Bulger, M. Steg, T. Dennis and S.E. MacAvoy
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903
- Page 103** **Chapter 7 - Modelling the Biological Effects of Water Quality Changes in the Streams of the FISH Catchments**
- Prepared by B.J. Cosby
Dept. of Environmental Sciences
Clark Hall, University of Virginia
Charlottesville, VA 22903