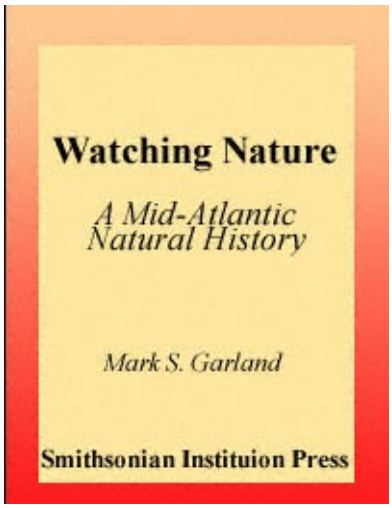

---

title:
author:
publisher:
isbn10 | asin:
print isbn13:
ebook isbn13:
language:
subject
publication date:
lcc:
ddc:
subject:

Watching Nature

A Mid-Atlantic Natural History

Mark S. Garland

With Art by John Anderton

Image not available.

SMITHSONIAN INSTITUTION PRESS
WASHINGTON AND LONDON

Disclaimer:
Some images in the original version of this book are not available for inclusion in the netLibrary eBook.

Editor: Catherine Puckett Haecker
Production editor: Jack Kirshbaum
Designer: Janice Wheeler
Typesetting and maps: Blue Heron Typesetters, Inc.

Library of Congress Cataloging-in-Publication Data
Garland, Mark S.
Watching nature : a Mid-Atlantic natural history / Mark S. Garland
: with art by John Anderton.
p. cm.
Includes bibliographical references and index.
ISBN 1-56098-742-1 (paper)
1. Natural historyMiddle Atlantic States. 2. Natural historyVirginia.
3. Natural historyWest Virginia. 1. Title.
QH104.5.M45G37 1997
508.75dc20 97-846

British Library Cataloging-in-Publication data available

Manufactured in the United States of America
02 01 00 99 98 97 5 4 3 2 1

The paper used in this publication meets the minimum requirements of the American National Standard for Permanence of Paper for Printed Library Materials Z39.48-1984.

To the memory of
Robert Coleman Garland,
my father and my best friend.

CONTENTS

PREFACE

This book is a love story. It's an expression of my love of exploring nature in the region I call home, the mountains from West Virginia to Pennsylvania, the coast from southern New Jersey through Virginia, and many places inbetween. It's a book about those places that I lovemountains, rivers, beaches, marshes, forests, and fields. It's also a book about what I love to exploretrees and flowers, birds and butterflies, salamanders and rocks. I hope, too, that there is some practical value to the book, that it can help lead others to fascinating places and wonderful discoveries. More than that, I hope this book expresses the wonder I find every day in this amazing world, and that it inspires the reader to explore, discover, love, and protect our natural environment.

You'll find no cookbook for nature study here, no explicit directions to particular places with long lists of what you'll see. Others have done this, and I've listed many of their excellent books in the references. But I invite you to join me as I ramble through these pages, telling stories and sharing favorite finds from many of our region's premier natural areas. Its my hope that you'll find here a full sense of placethe big picture. I'll feel successful if I nurture some basic understandings of the complex assemblages of rocks and dirt and plants and animals that are nature in the mid-Atlantic region.

I've had a lot of help putting this book together. Thanks to all who have spent time in the field with me. I've had the good fortune to take field trips to many parts of the mid-Atlantic with literally thousands of people over the

last 25 years. I can't express my gratitude to them all, but I'd like to single out some people whose teaching, encouragement, inspiration, and companionship in the field have been especially helpful:

Kim Bierly, John Bjerke, Rich Bray, Ronald L. Canter, Paige Cunningham, Kathy Dale, Janet Dierker, Margaret Donnald, Morrill Donnald, Miles Drake, Nathan Erwin, Tom Feild, Neal Fitzpatrick, Cris Fleming, Vagn Flyger, Harry C. Garland, Mary T. Garland, Robert C. Garland, Robert T. Garland, Rob Gibbs, Denise Gibbs, Laura Gaudette Green, Helen Kavanagh, Ivan Klein, Roger Klinger, Tamar Krichevsky, Larry Lang, Helen G. Mackintosh, Stephanie Mason, Donald H. Messersmith, Karyn Molines, Gary Mozel, William L. Murphy, Lola Oberman, Richard Orr, Joseph Patt, Gary Pendleton, Robert Michael Pyle, Tim Ray, Joel Rhymer, Michael Rosen, Jack Schultz, Lora Seraphin, Marti Seraphin, Michael E. Seraphin, Michael R. Seraphin, Stanwyn G. Shetler, Robert C. Simpson, Richard H. Smith, Darryl Speicher, David W. Sturman, Mark Swick, William H. Triplett, John Trott, Keith Van Ness, Natalie Venneman, Leo Weigant, Jan Westervelt, Tony White, Hal Wierenga, Claudia Wilds, Erika Wilson, and Emmett L. Wright.

I give special thanks to Ken Nicholls, former executive director of the Audubon Naturalist Society, for encouraging me to take nature writing seriously. I also thank members of the editorial staff of the *Audubon Naturalist News,* particularly Kathryn Karsten Rushing, Leslie D. Cronin, and Barbara Tufty, who nurtured me when I was a beginning writer. Portions of this book are modified from articles that originally appeared in the *Audubon Naturalist News,* a publication of the Audubon Naturalist Society. Thanks to those who made comments on early drafts of this manuscript, Kent and Marcia Minichiello, and anonymous reviewersthis is a far better book thanks to their valuable suggestions. Thanks to John Anderton for his amazing illustrations; I hope the words are worthy of his fine art. The staff at Smithsonian Institution Press has earned my deep gratitude and respect. Thanks to Peter Cannell for his vision and for his confidence in me. Thanks also to Jack Kirshbaum, Janice Wheeler, Catherine Puckett Haecker, Ken Sabol, Kate Gibbs, and the rest of that fine staff.

Because I have a tendency to be absentminded, it's likely that I've forgotten a few important people; I hope they will forgive me. In spite of all this excellent assistance, there certainly could be some errors in the text, and these, of course, are solely the responsibility of the author.

1
Allegheny to Atlantic
An Overview of Mid-Atlantic Natural History

Nature is all around us. It is the landscape on which we live, the climate that brings us weather, the plants and animals that share the planet's surface with us. Those plants produce the oxygen we breathe and support the life of all animals, including ourselves, either directly or indirectly. We are part of nature, and our lives depend on nature every moment of every day. Our busy lives make it easy to forget nature, however, especially if we live in urban and suburban areas. This book is for people who don't want to forget.

The region covered by this book is an irregularly shaped area surrounding Washington, D.C. and Baltimore. These major cities lie in the midst of the

Image not available.

Beaver and pond

great megalopolis of the eastern U.S., an extensively developed and densely populated region that stretches along much of the East Coast. At first glance this region may seem like a poor one for nature study, yet it includes a surprising number of highly diverse natural areas to explore, including elements of southeastern ecosystems, northern boreal environments, and a variety of transitional habitats. Areas less than 150 miles away from Washington, D.C. include varied highlands of the Allegheny Mountains and the Blue Ridge, surprisingly pristine river systems from the Potomac to the Pocomoke, rich coastal and marine environments of the Atlantic Ocean and the Chesapeake Bay, and southern forests with subtropical affinities. The region's central location in eastern North America, combined with the cooling effect of altitude and the warming influence of the ocean, enables all but the most extreme habitats of the eastern half of the continent to exist in one place or another.

Naturalists living in the Washington-Baltimore region have many plants and animals at hand to learn about and to observe, and have many habitats to explore. That's what I've been doing for much of my life, and with this book I hope to provide a general overview of the natural history of this region, loosely defined as that portion of the mid-Atlantic within a 4-hour drive of the Washington, D.C. and Baltimore metropolitan centers. Along the way I'll tell a few stories of my own explorations. This chapter provides a general framework for such a study. Subsequent chapters embellish this introduction, focusing on some seasonal natural history highlights and looking at specific natural areas of interest. My intent is to provide a starting point for an understanding and appreciation of nature in this region.

Basic Mid-Atlantic Ecology

The mid-Atlantic region is neatly divided geologically into these four provinces: the Allegheny Plateau, Ridge and Valley, Piedmont, and Coastal Plain. These fundamental subdivisions are used not only to define area and geological origins, but also to describe plant and animal communities, for each of the four provinces is home to ecosystems whose characteristics are distinctly different from each other.

The ecological communities found in any given region are influenced by a combination of climatic factors and features of the landscape, both now and in the past. Landscape, climate, and history determine a region's plant

communities, which, in turn, influence the wildlife found in each place. All these factors influence past and present human settlement and development of the region, which profoundly affect all our ecosystems, on local and global scales.

I use the following basic framework to develop an understanding of any region's natural history. First, examine the landscape and climate. Next, study the plant and animal communities. Finally, factor in the influence on the landscape wrought by peopleboth destructive and protective activities. Let's follow this model for the mid-Atlantic.

Geology

Roughly 250 million years ago, during the late Paleozoic era and just before the rise of dinosaurs, the combined land mass of Europe and Africa pushed against that of the Americas. This pressure, which continued for millions of years, caused an enormous uplift of the eastern edge of North America; the entire landscape was pushed tens of thousands of feet upward. Close to the impact zone, the existing sedimentary and igneous rocks were twisted and folded, broken along large planes called faults, and physically changed into metamorphic rocks by tremendous subterranean heat and pressure. Farther west less pressure resulted in gentle folds, fewer faults, and less metamorphism.

What goes up must come eventually down. As the land began to rise, erosive forces increased. The mountains wore down even as they rose, though not as quickly. The uplift of eastern North America, known as the Appalachian orogeny, ended more than 200 million years ago, but erosion continues to this day. The present landscape of eastern North America reflects those uplift periods of long ago and their continuous erosion.

Because the westernmost uplifted areas were relatively removed from the pressure front, they showed less folding and soon eroded down to highly resistant layers. These layers slowed the erosive rate dramatically, leaving an elevated landscape that exists today as the Allegheny Plateau. The westernmost areas considered in this book include the West Virginia Highlands and Garrett County, Maryland, both areas on the Allegheny Plateau.

East of the Allegheny Plateau lies the Ridge and Valley province, a region of

long, parallel ridges separated by broad, low valleys. Here the pressures of mountain building were more severe, resulting in greater twisting

Image not available.

Map 1.
Mid-Atlantic Region

Image not available.

and faulting of the bedrock. Resistant rock layers occur here as they do on the Allegheny Plateau, but they are heavily fractured. Because fractures are subject to much more rapid erosion than are unbroken rock layers, erosion has been far more substantial in the Ridge and Valley region than on the Allegheny Plateau. In contrast to the broad highlands and narrow, elevated valleys of the Allegheny Plateau, the Ridge and Valley features narrow ridges, most considerably lower in elevation than the highlands of the plateau, and broad, low valleys, many less than 1,000 feet in elevation. The Great Valley, which is also called the Shenandoah Valley in Virginia and the Hagerstown Valley in Maryland, is the broadest of these lowlands. The Blue Ridge, home to Shenandoah National Park and a section of the Appalachian Trail, forms the eastern edge of the Great Valley and, in most places, the eastern edge of the Ridge and Valley province. Most of the mountains of Virginia discussed in this book lie in the Ridge and Valley province, as do areas in eastern West Virginia, most of western Maryland, and much of central Pennsylvania.

The next region to the east is the Piedmont province, the term derived from French words meaning *foothill*. Here the landscape is lower and gently rolling with a few prominent ridges or isolated peaks that are called monadnocks. This region felt the full force of the Paleozoic collision of continents, when its rocks were twisted, gnarled, faulted, and metamorphosed. Erosive forces have taken the heights of the Piedmont almost down to sea level, with only the most erosion-resistant rocks showing significant relief, as at Sugarloaf Mountain in Maryland and Bull Run Mountain in Virginia.

The eastern edge of the Piedmont is called the Fall Line. It is at this geologic boundary between the resistant rock of the Piedmont and the softer sediments of the Coastal Plain that creeks and rivers tumble over their last falls and reach elevations within a few feet of sea level. It's easy to draw the Fall Line on a political map; most major mid-Atlantic cities developed on the Fall Line, including Richmond, Fredericksburg, Washington, D.C., and Baltimore.

All of the regions listed thus far have been eroded landscapes, where Earth's surface is primarily expressed as raised bedrock minus material that has been eroded away. East of the Fall Line lies the Coastal Plain province, which is basically a depositional landscape where bedrock occurs below sea level. The land that we see at the surface in the Coastal Plain province is material eroded from the highlands to the west and deposited here. A lot of material can wash down from the mountains in more than 200 million years! The entire

landscape from the Fall Line to the Atlantic coast and, to some

extent, to the edge of the Continental Shelf, 50 or more miles offshore, is built up from material eroded down from the highland regions to the west. Along many parts of the Atlantic coast these sediments are more than 2,000 feet thick.

Climate

The mid-Atlantic region is part of the warm, moist-temperate climate zone. Significant variation in precipitation exists in different portions of the region, though all areas have enough rainfall for forests to exist as the climax vegetation. (In ecology, *climax* refers to the ecosystem that eventually develops in the absence of disturbance.) Instead of pronounced wet and dry seasons, precipitation is fairly equally spread throughout the year. Temperature variations are more extreme, with highland areas significantly colder than coastal areas in every season. All parts of the mid-Atlantic see subfreezing temperatures every winter.

Microclimates and their effects can be observed in many places. Microclimates exist in places where a small area's annual temperature or rainfall differ from surrounding areas because of unusual topographic features. Some areas with interesting microclimatic variations are noted later in this book, but here I look only at the general trends for each region.

The Allegheny Plateau is the coldest and wettest province of the four. Its colder temperatures are a result of altitude and distance from the sea. Much of the Allegheny Plateau is above 3,000 feet (900 meters) in elevation, and higher elevations are cooler than lower ones. When all other factors are equal, a rise of 1,000 feet (300 meters) corresponds to a temperature drop of about 3.5 degrees Fahrenheit. The Atlantic Ocean off the coast of the eastern United States is relatively warm because Gulf Stream currents move subtropical waters northward along the coast. The land closest to these warm ocean waters benefits from this moderating influence on its climate.

Much of our region's precipitation is borne on prevailing westerly winds. In all seasons, but most frequently during winter, moisture-laden low pressure systems regularly move across the continent. These air masses are forced to rise as they reach the Allegheny Plateau mountain system. As the air rises and cools, its moisture-holding capacity decreases, condensation occurs, and it rains or snows. Although Washington, D.C. averages about 40 inches (100 centimeters) of precipitation per year, the average is over 50 inches (127

centimeters) at weather stations on the Allegheny Plateau.