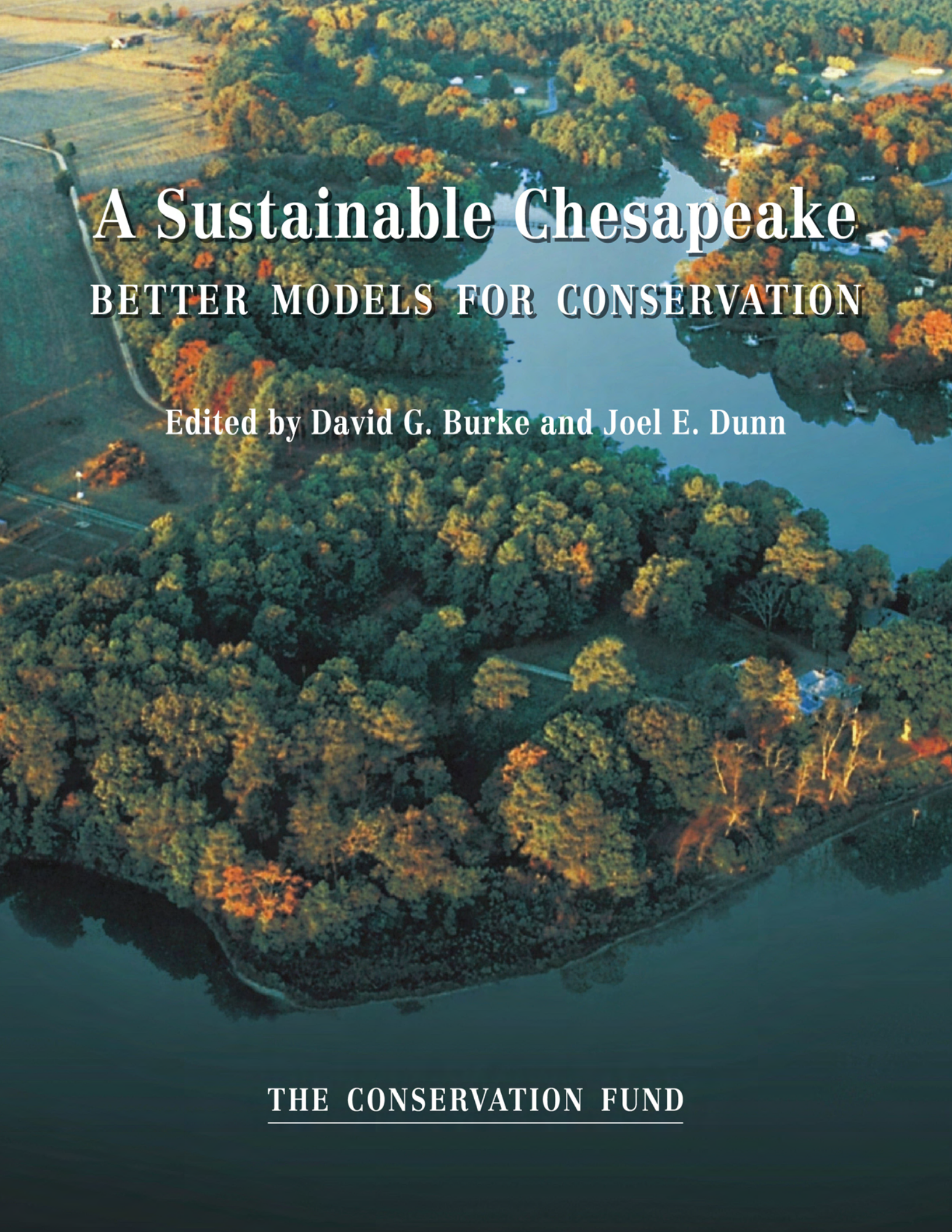

A Sustainable Chesapeake

BETTER MODELS FOR CONSERVATION

Edited by David G. Burke and Joel E. Dunn

THE CONSERVATION FUND

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Hull Springs Farm near Erica, Virginia. Courtesy of Longwood University Foundation

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Forward

In envisioning the future we desire, we gain inspiration from the words that Captain John Smith wrote in 1612 to describe the Chesapeake Bay: "…Heaven and earth never agreed better to frame a place for man's habitation…".

Much has changed since Smith wrote those words. The Chesapeake region has provided a fine place for mankind. It has inspired us, consoled us, and nurtured us. We have thrived here. Yet each of us has extracted our own ecological costs, borrowing from the immense richness of this natural system. Now is the time for us to repay the loan.

A Sustainable Chesapeake: Better Models for Conservation shows us places to begin.

A few years ago David Burke, whose work I've long admired, approached me with the idea of compiling a collection of new initiatives that could guide future conservation planning in the Chesapeake region. I was pleased to provide my early support. The idea behind this book is to promote and detail emerging conservation innovations. It is intended to energize those of us who are seriously motivated to restore the Bay at this critical moment, when scientists tell us the Bay has reached a tipping point and is fighting a win-or-lose battle for its health in the face of continued pressures from a growing population and new stresses from a rapidly changing climate.

Government-led efforts have never been and will never be enough to protect and restore the Bay. So, in addition to the great efforts of our state and federal agencies to rescue this ecosystem, we need widespread participation in proven conservation actions by individuals, businesses, and communities. A Sustainable Chesapeake reports on a collection of best models of conservation progress taken by these groups. It provides us with a blueprint to guide our engagement in the restoration of the Chesapeake, America's largest estuary and one of the nation's Treasured Landscapes.

The Chesapeake's beauty is subtle, but it is grander to me than any canyon or mountain. Here is a natural masterpiece composed of the most diverse and productive ecosystems in this country. Long sweeps of shorelines, great rivers, rich woods, productive farms, and thriving towns paint this landscape. Vital chapters of American history were written here: rich American Indian cultures were followed by Capt. John Smith's explorations of the Bay and the founding of the first successful English colony; our nation's economy took root here; wars that defined the young republic–the Revolution, 1812, the Civil War–all turned here.

It is my hope that people and organizations will adopt and apply the concepts and techniques featured in this book to improve their local environment and accelerate a watershed-wide recovery of the Bay and its system of great rivers. Whether facing the challenges of pollution, loss of open space, deforestation, sea level rise, or invasive species, the models demonstrate how people have solved natural resource challenges. These stories give us welcome news and provide new conservation knowledge that is applicable in communities across the Chesapeake Bay watershed.

Someday our grandchildren will thank us for our work. That will be reward enough.

Patrick F. Noonan

Preface

We live and work along the shores of the Chesapeake Bay. Like many people throughout the watershed, our individual identities have been influenced by the natural and cultural history of our land and water.

The Bay watershed includes more than 64,000 square miles of land and 100,000 miles of streams and rivers encompassing parts of six states including Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the entire District of Columbia. Each sub-watershed is uniquely defined by its own local culture that has been shaped over time by the Chesapeake's air, water, vegetation and wildlife. Our communities take pride in the diversity and beauty of the region's landscapes and acknowledge the environment's great influence on our well-being, creativity and economy.

Across our watershed, there is near universal agreement that the Bay ecosystem is vital to our quality of life. Nevertheless, we are currently witnessing a profound watershed wide ecosystem collapse evidenced by deforestation, rapid conversion of open space, loss of fish and wildlife populations and dangerously poor water quality. Tragically, as a result of industrial, residential and agricultural pollution, many of our prime rivers and streams are no longer fishable or swimmable. Despite one of America's longest and most intensely coordinated efforts to protect and restore the estuary, ecosystem health and productivity continue to sharply decline.

As with many conservation professionals, we are working to reverse these trends by restoring and sustaining the natural resources in our watershed. We feel strongly that environmental sustainability is a matter of intergenerational responsibility, and we are committed to finding ways to meet the needs of the present without compromising the opportunity of future generations. The goal of this publication is to provide the Chesapeake community with models of successful projects that have moved us one step closer to a sustainable future, which can be replicated in communities across the watershed.

The case studies and topic areas featured in this publication are primarily the result of choices made by the editors in consultation with a handful of knowledgeable people who pointed us in the right direction and encouraged us to further investigate their suggestions. The institutional focus and environmental interests of our publication sponsors also influenced the topic areas and types of case studies we highlighted. Several commendable efforts brought to our attention could not be included in this publication due to time constraints and financial limitations. We are well aware of the incomplete and subjective process we pursued in bringing these stories to light. However, since we made these selections we have observed at least two of our featured case studies have or will soon receive national recognition. We hope more will be recognized and that philanthropic organizations will lend their continued support to these on-going conservation initiatives.

Several individuals and organizations have acknowledged the need to provide greater information about exemplary conservation efforts. In this day of the internet some would say all one needs to know is already online or in print. But, as avid internet users ourselves, we found projects of interest to us were incomplete or highly technical promulgated by and of greater use to academics and specialists, not typical conservationists. We also investigated some very impressive sounding projects that we subsequently discovered lacked practical value or real substance. We

also found that people who were doing great things on the conservation front lacked the opportunity and temperament to write their story and share it with the world. By personally screening these case studies the editors hope to bring something of value to our reader audience.

Along with others in the environmental community, we have observed the recent strong push to regulate and enforce our way into a cleaner Chesapeake Bay and healthier watersheds. This argument has strong merit given the poor success of the voluntary approach to restoration. At the same time we remained convinced that the inspired stewardship of private landowners and the business community has an equally important role to play. It is precisely during these times when a powerful movement to force restoration is in the forefront, that we should continue to seek attractive, cost-effective, incentive driven and voluntary conservation actions that move us closer to a sustainable Chesapeake Bay.

PRINCIPLES UNDERLYING THE BETTER MODELS CASE STUDIES

Realistically, the editors anticipate that only a few determined souls will read this entire publication. We hope many will use it as a resource to generate and adapt ideas for locally engineered conservation solutions. To underscore the underlying principles these case studies rest upon, we have summarized two to four statements for each of the six topic areas covered: climate change solutions, stream restoration, green infrastructure, incentive driven conservation, watershed protection and stewardship. Necessarily, the principles do not encompass all that could be summarized from the featured case studies. However, we hope they will help guide the general conduct of conservationists along a path of more sustainable natural resource management. For convenience, the principles found within the introduction of each chapter are summarized below.

CLIMATE CHANGE

- **Use the best available data, assessment protocols and geospatial planning tools:** The scientific and technological dimensions of climate change prediction and mitigation techniques are complex and dynamic. Planners and managers charged with addressing the impacts of climate must rigorously document the data, assumptions and methods used in their decision making processes. They must also identify natural and public resource management priorities and risks in response to climate change. Plans should be modified or updated in accordance with advances in science and technology.

- **Encourage local government innovation and application of regional adaptation strategies:** The magnitude and seriousness of the potential impacts from climate change will be different based on varying physiographic and economic conditions and settlement patterns. Government policy makers should encourage and support a diversity of adaptation approaches that will collectively advance our capacity to address threats to the local environment and built infrastructure.

- **Improve public awareness of climate change risks and adaptation responses:** A significant degree of public skepticism and inertia still persists regarding the risks and challenges society will confront as a result of climate change. The slow pace of observable change works to reinforce public apathy. New communication and education strategies and incremental goals for change must be developed to redefine the actions different sectors of society should adopt to prevent potentially disastrous results.

STREAM RESTORATION

- **Avoid increasing the need for stream restoration by managing upstream stormwater:** Many streams are degraded because of a lack of stormwater management practices in the upstream catchment area that treat the quantity and quality of runoff. Preventative measures should be implemented first, such as infiltrating stormwater runoff closest to its source and maintaining adequate natural riparian buffers for existing and anticipated future development conditions.

- **Engage citizens in the design and implementation of urban stream restoration projects:** Although the practice and scientific dimensions of stream restoration are highly complex, the design process should extend beyond experts and include citizen engagement to incorporate tangible benefits for the community.

- **Budget for post-monitoring of stream restoration projects to assess performance and improve future results:** Stream restoration is part science and part art. Many restoration techniques have become standard practice and others are emerging or yet to be discovered. Our scientific knowledge of how these techniques perform within their landscape and hydrological settings is incomplete, but can be greatly expanded through well designed and documented scientific monitoring protocols.

GREEN INFRASTRUCTURE

- **Plan at multiple scales to protect the complete green infrastructure network:** Identifying the green infrastructure land network and devising protection strategies needs to occur at all geographical and jurisdictional levels and requires intergovernmental and private landowner collaboration and monitoring of progress at regular intervals.

- **Select appropriate implementation tools:** Conservation of the green infrastructure land network involves careful consideration and selection of implementation tools tailored to fit specific circumstances. The most commonly used methods are: public land acquisition; donated conservation easements; landowner best management practices; and land use controls which limit both direct and indirect impacts to a variety of green infrastructure physical and functional components.

- **Stimulate action through credible analytical techniques and public participation:** The use of thorough, defensible assessment methods and well chosen environmental indicator data have a proven track record. Simple presentation graphics communicating study results enhance citizen and decision-maker understanding of the values of and need for protection of green infrastructure networks. Providing opportunities for public participation in the decision making process increases the likelihood of acceptance and stimulates implementation actions.

INCENTIVE DRIVEN CONSERVATION

- **Complement and reinforce environmental regulations and land use controls with incentive driven conservation:** A combination of regulations, land use controls, and incentive driven conservation measures are needed to restore the Bay watershed. The power of a well defined, diverse system of financial and social recognition incentives will continually inspire entrepreneurial and voluntary conservation actions by citizens, NGOs and businesses. Movement toward a "greener" economy, where fully developed markets are established for the purchase of ecosystem services, holds great promise for regenerating the rapidly depleting natural resource base of the watershed.

- **Accelerate site specific and area-wide conservation needs with market-based solutions:** Open markets and government regulated markets have been created around the demand for nutrient reduction, endangered species habitat conservation, carbon reduction, wetland creation, and afforestation and reforestation. Landowners can align their land management needs with these emerging market-based opportunities and simultaneously help the Bay. Government decision-makers can facilitate and steer market-based solutions to accelerate the pace of conservation in targeted geographic areas to help achieve predetermined environmental outcomes.

WATERSHED PROTECTION

- **Use watershed assessment tools to direct growth management policy:** Historical settlement patterns and poor planning and development policies have left a legacy of harmful environmental impacts across the watershed. New GIS resource inventory and watershed assessment techniques bring powerful science based insights that can vastly improve government land use planning and growth management decisions —allowing us to escape, reduce or reverse the damaging effects of poor development choices.

- **Strengthen local advocacy efforts by using scientifically-based data and legal strategies:** Even small neighborhood organizations and marginally funded environmental advocacy groups can make their voices heard and redirect ill-conceived development plans. Advocacy actions that are supported by scientific data and legal strategies provide strong credibility, improve awareness of potential environmental consequences and can broaden public support for positive change.

- **Create solutions to environmental problems using market forces:** A nationwide trend in economic development focuses on the expansion of natural industry "clusters" that yield synergistic and competitive advantages in the global market place. Cluster industries in our watershed, such as poultry production and mining, produce "waste" products that can be converted into environmental resources to leverage rapid, positive changes and enhance the local economy.

STEWARDSHIP

- **Review and realign land management plans and practices at regular intervals to incorporate sustainability measures:** Scientists, researchers and field practitioners are constantly discovering new and better ways to manage land that employ less energy intensive methods, reduce life cycle operating costs, improve environmental performance and yield better results. Whether the land is being used to grow a lawn, produce farm products or manage a forest, regular consultations with experts that share a concern for sustainable management practices should be conducted to develop robust stewardship plans.

- **Harness biological processes to reduce pollution, benefit wildlife and people:** Native plants and the natural biological functions they perform are a practical, low cost, enduring solution to a wide array of watershed problems. There are many circumstances where vegetative solutions can be readily incorporated into terrestrial and aquatic environments or artificially engineered systems to remove or reduce pollutants, stabilize eroding landscapes, improve air quality, shelter wildlife and provide aesthetic and recreational benefits to people.

- **Maintain native flora and associated biodiversity:** Increased

commerce and mobility of people across the planet has caused the introduction of numerous invasive exotic plant and animal species that have disrupted and, in many instances, irretrievably altered native ecosystems. Maintaining native flora requires an active effort to remove invasive species. Native plant communities are critical to keeping diverse, sustainable landscapes that support naturally adapted plant communities and associated wildlife.

CONCLUSION

We are grateful to all of our featured authors and the resource managers, staff and financial supporters who are engaged in these conservation initiatives. These people have graciously sacrificed their time to show us what good conservation entails and what is possible for others to learn and do based on their work.

We sincerely hope our reader audience will take the time to explore and use at least some of the techniques and ideas of greatest interest. We ask that readers remember this publication as a potential resource now and in the future as you or your colleagues move forward on a path of sustainable resource management in the Chesapeake Bay watershed.