

Documenting and Protecting Biodiversity on Land Trust Projects


— *an introduction and practical guide* —



Written by

CHRISTOPHER R. WILSON

Published by
 Land Trust Alliance
Together, conserving the places you love

With funding from
 Sweet Water Trust

Documenting and Protecting Biodiversity on Land Trust Projects

— an introduction and practical guide —

CHRISTOPHER R. WILSON

Published by the Land Trust Alliance

With Funding from Sweet Water Trust

First Edition

Copyright 2011 by the Land Trust Alliance

All Rights Reserved

All images (maps, tables, graphs, photographs, illustrations, etc.) are used with permission.

Designed by Peter Holm, Sterling Hill Productions

Copyedited by Kate Mueller

ISBN 978-0-943915-04-3

Contents

List of Charts, Maps, Tables, v

List of Abbreviations, vii

Acknowledgments, ix

Introduction, 1

1. Land Trusts' Role in Protecting Biodiversity on Private Lands, 5

You Can't Protect What You Don't Know About, 6

It's the Professional Thing to Do, 7

Barriers to Biological Assessments, 9

2. Biodiversity: What Should We Protect and Why?, 11

What's Threatening Biodiversity?, 13

Why Is Biodiversity Important?, 13

What Is Biodiversity?, 14

Conserving Biodiversity, 18

3. Priority Biological Features, 20

Endangered Species Programs, 21

Bird Conservation Programs, 22

Clean Water Programs, 25

Natural Heritage Programs, 26

Ecological Communities • Natural Community Classification •

Conservation Status Ranks • Element Occurrence Quality Ranks

4. Priority Geographic Areas, 37

State Wildlife Action Plans, 38

The Nature Conservancy's Ecoregional Assessments, 42

Connectivity-Based Landscape Conservation Plans, 46

Additional Landscape-Scale Conservation Plans, 51

*National Plans • Local, State, and Regional Plans • Limitations of
Landscape-Scale Conservation Plans*

5. Conducting an Off-Site Review of Biological Information, 55

Start Early!, 55

Initial Landowner Interview, 56

Submit an Information Request to the Natural Heritage Program, 57

Review Mapping from Conservation Plans, 62

Assess Wetland and Stream Information, 65

Assess the Conservation Context, 69

Assess Land Cover Types, 72

Preparing for Fieldwork, 75

6. On-site Biological Features Inventories, 98

Is a Biological Inventory Necessary?, 98

What Do Biological Inventories for Land Trust Projects Involve?, 99

Natural Community and Habitat Inventories, 101

Natural Community Inventories • Habitat Inventories

Species Inventories, 105

Plants • Birds • Amphibians • Reptiles • Mammals • Fish •

Butterflies and Dragonflies • Other Species Groups

Finding the Right Person for the Job, 113

Getting the Most from a Biologist, 115

Communicate the Project Background • Communicate Your Needs to a Biologist • Potential Rare Species • Sensitive Areas, Special Management Zones, and Buffers • Natural Heritage Program Reporting • Final Report and Mapping

7. Using Biological Assessments to Protect Biodiversity, 123

Project Selection and Fundraising, 123

It Pays to Know: Biological Information Can Help Fundraising, 123

Drafting Conservation Easement Language for Biodiversity Protection, 125

Preparing the Baseline Documentation Report, 130

Developing a Management Plan, 131

Conservation Easement Monitoring, 133

Conclusion, 134

References, 136

List of Charts, Maps, Tables

Charts

- Proportion of U.S. Species at Risk, 11
- Proportion of Species at Risk by Plant and Animal Group, 12
- Major Threats to Biodiversity, 13
- Compositional, Structural, and Functional Components of Biodiversity, 16
- Four Geographical Scales of Biodiversity, 17
- Connecting Natural Areas, 48

Maps

- Example: Key Habitats Map, 41
- Example: Focus Areas Map, 41
- Example: The Nature Conservancy's Ecoregions of the United States of America Map, 43
- Example: The Nature Conservancy's Ecoregional Portfolio for the Northern Appalachian/Acadian Region, 44
- Example: The Nature Conservancy's Ecological Portfolio for the Southern Rocky Mountains Ecoregion, 45
- Example: Wildlands Network's Spine of the Continent Initiative, 50
- Example: Wildlands Network's Design for the Southern Rocky Mountains Ecoregion, 52
- Perry Reservation: USGS Topographical Map, 58, 84
- Example: Natural Heritage Information Request Report, 60, 85
- Perry Reservation: Key Wildlife Habitat Map; NH Wildlife Action Plan, 63, 86
- Perry Reservation: Highest Quality Wildlife Habitat Map; NH Wildlife Action Plan, 63, 87
- Perry Reservation: TNC Ecoregional Portfolio; Lower New England/Northern Piedmont, 64, 88
- Quabbin to Cardigan Initiative (Q2C), 64, 89
- Perry Reservation: Wetland Features; National Wetland Inventory, 68, 90
- Perry Reservation: Conservation Context, 71, 91
- Perry Reservation: NatureServe Ecological Systems, 73, 92
- Example: Fine-Scale Natural Community Mapping, 93, 102
- Example: Natural Community Mapping, 94, 103
- Example: On-the-Ground Wildlife Habitat Mapping, 95, 104

Example: Designating Multiple Zones of Use in a Conservation Easement, 96, 118

Example: Map of Priority Conservation Areas on a Project, Priority Conservation Areas, 97, 120

Tables

Example: Partners in Flight Species Assessment, 23

Example: Partners in Flight Species Assessment Action Codes, 24

Example: National Vegetation Classification Hierarchy, 29

Example: Natural Community Classification Description, 30

Example: Global Conservation Status Ranks, 31

Example: State Conservation Status Ranks, 32

Example: Atlantic White Cedar Swamp Ecological Integrity Rank Table, 35

Example: List of Species of Greatest Conservation Need, 39

Example: Species of Greatest Conservation Need: Priorities, Threats, and Conservation Actions, 40

Example: Natural Heritage Information Request Report, 60

Wetlands and Deepwater Habitats Classification, 66, 67

National Wetlands Inventory Codes, 69

List of Abbreviations

BDR	Baseline Documentation Report
BRC	Blue Ridge Conservancy
CDOW	Colorado Division of Wildlife
CMP	Conservation Measures Partnership
EO	Element Occurrence
ESA	Endangered Species Act
FGDC	Federal Geographic Data Committee
GAP	Gap Analysis Program
GIS	Geographic Information System
GPS	Global Positioning System
IRC	Internal Revenue Code
IRS	Internal Revenue Service
NCED	National Conservation Easement Database
NHD	National Hydrography Dataset
NMFS	National Marine Fisheries Service
NVC	National Vegetation Classification
NWI	National Wetlands Inventory
NWT	Northeast Wilderness Trust
PAD-US	Protected Area Database of the United States
PIF	Partners in Flight
Q2C	Quabbin to Cardigan Initiative
SGCN	Species of Greatest Conservation Need
SWAP	State Wildlife Action Plan
TNC	The Nature Conservancy
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
WAP	Wildlife Action Plan

Acknowledgments

This handbook was made possible through generous financial support provided by the Sweet Water Trust. I am particularly grateful to Walker Buckner and Eve Endicott of Sweet Water Trust, as well as the staff and board of the Santa Lucia Conservancy, for their enthusiastic support and encouragement of this project. Rob Aldrich of the Land Trust Alliance and Kendall Slee of Kendall Slee Communications served as the primary editors and guided this project to completion.

The handbook benefitted greatly from the experiences, insights, and feedback from the following individuals who reviewed the handbook in sections or in its entirety:

Rob Aldrich, Land Trust Alliance, Washington, D.C.
Paul Beier, Northern Arizona University
Mark Berman, Wildlands Network, North Carolina
Judy Boshoven, Defenders of Wildlife, Living Lands Project,
Virginia
Pat Comer, NatureServe, Colorado
Kyle Copas, NatureServe, Virginia
Andrew Cutko, Maine Natural Areas Program, Maine
Amielle DeWan, Defenders of Wildlife, Living Lands Project,
Virginia
Eve Endicott, Sweet Water Trust, Massachusetts
Kenyon Fields, Wildlands Network, Washington
Mitch Hartley, U.S. Fish & Wildlife Service, Atlantic Coast Joint
Venture, Massachusetts
Mark Lapin, Middlebury College, Vermont
Arvind Panjabi, Rocky Mountain Bird Observatory, Colorado
Conrad Reining, Wildlands Network, Vermont
Kendall Slee, Kendall Slee Communications, Colorado
Kim Vacariu, Wildlands Network, Arizona
Rick Van de Poll, Ecosystem Management Consultants, New
Hampshire
Marla S. Wilson, Humane Society Wildlife Land Trust, California

The following individuals provided advice, insights, examples, maps, or figures that contributed to the quality and usefulness of this handbook:

Connor Bailey, Rocky Mountain Wild, Colorado
Mark Berry, Downeast Lakes Land Trust, Maine
Jason Bulluck, Virginia Natural Heritage Program
Kevin Caldwell, Mountains-to-Sea Ecological, North Carolina
Steven Carter, North American Land Trust, Pennsylvania
Jeff Corser, New York Natural Heritage Program, New York
John Davis, Adirondack Council, New York
Lee Echols, North American Land Trust, Georgia
Eric Hiegl, Blue Ridge Conservancy, North Carolina
Timothy Howard, New York Natural Heritage Program
Andrew Johnson, North American Land Trust, Pennsylvania
Janet McMahon, Ecologist, Maine
Jason McNees, NatureServe, Virginia
Paul Myers, TetraTech, Maine
James Northup, Northeast Wilderness Trust, Vermont
Rob Riordan, NatureServe, Virginia
Breece Robertson, The Trust for Public Land, New Mexico
Michael Scisco, BioGeoCreations, New Mexico
Tom Segerstrom, Jackson Hole Land Trust, Wyoming
Paige Bonaker Singer, Rocky Mountain Wild, Colorado
Peter Smith, North American Land Trust, North Carolina
Liz Thompson, Vermont Land Trust, Vermont

I also received advice or assistance from the following organizations: Society for the Protection of New Hampshire Forests, Colorado Natural Heritage Program, New Hampshire Natural Heritage Bureau, Montana Natural Heritage Program, and The Nature Conservancy, Eastern Regional Science Office.

Introduction

People value nature for different reasons and usually for a variety of reasons. I value the big, beautiful mystery of it. The more you search, the more you realize every species, natural community, or landform has a long, beautiful story behind it, and science and the human mind are only prepared to comprehend the first few pages.

An endangered salamander stares back at me from her rock crevice in the North Carolina mountains. I think about how she coevolved with the specific type of forest that surrounds us, which is one of the most diverse in the world. An early version of this forest type used to span the northern hemisphere of the Pangaea supercontinent hundreds of millions of years ago, and now the best remaining examples exist where I stand and in China. The salamander has probably existed as a species for more than 20 million years and might only be around a little while longer. Then I realize, at that moment, I'm probably the only person on the planet having face time with this species and on its terms.

I became a biologist because I crave these experiences, but they come at a cost. You become deeply aware of how tragic the biodiversity crisis really is. You feel compelled to do something about it, and you hope others can be convinced to find value in the information you provide and actually use it for the greater good.

In the United States alone, we have lost between 100 and 500 species since European settlement. The current global species extinction rate is 1,000 to 10,000 times the normal background rate throughout the earth's biological history. Such a spike hasn't happened since a large asteroid struck the earth 65 million years ago. Now we are the asteroid.

There are all sorts of perfectly practical and utilitarian reasons why the loss of species should concern everyone. But I like to think of it this way: Losing species and ecosystems in the name of growth and progress is like selling your organs. You can make a quick buck, but you have lost parts of yourself. You have to assume they have value, regardless of whether you understand them.

The biodiversity crisis is driven primarily by habitat loss, which is no surprise. In the United States, only 42 percent of the land remains covered with natural vegetation, more than half the wetlands have been filled since the



Jeff Corser

Introduction

American Revolution, and we continue to lose about 1.6 million acres of open space each year to development.

We have all witnessed the disappearance of these places. The woods around my house in south Florida, where I played as a child and went hunting with my dad, have become subdivisions and strip malls. The blissful wildflower meadows of the Colorado Front Range, where I learned botany, suffered the same fate. Fortunately, communities around the country have stepped up and taken action by forming land trusts to protect the natural lands they love. This movement has grown exponentially in recent years and focuses on working with willing landowners to protect private lands for the public good. This is particularly important for biodiversity conservation because private lands hold a disproportionate number of rare or at-risk species and ecosystems compared with public lands.

This handbook evolved from my experiences working as a consulting and staff biologist for land trusts across the country and from my involvement with biodiversity sessions at Rally, the Land Trust Alliance's National Land Conservation Conference. During this time, I have noticed that:

1. Land trust workers often wish to incorporate biological information and protections into their projects but, since they are usually not biologists, are not sure how to proceed.
2. Biologists and consultants, who wish to help land trusts, are not clear on what types of biological information the land trusts need, how the data will be used, and how land trusts operate.
3. Landowners are unsure of how their land protection project will benefit from such information.

This book is meant to help bridge these gaps between conservation science and its application to the protection of private lands. The goal is to help land trust practitioners and landowners understand what biodiversity is, how it's conserved, how the important biological attributes of a project are identified and documented, and how to translate this information into protection and management. It is also meant to help biologists, consultants, and landowners understand the role and responsibilities of land trusts, what types of biological information are most useful, and how this information is used in the land protection process.

In a rush to make a land protection deal happen, biological assessments and inventories are sometimes viewed as unnecessary, complicated, and expensive. To the contrary, they can bolster land protection projects and can be easier and less expensive than most people think. Besides identifying strategic, high-

Introduction

quality projects that maximize conservation benefits, an analysis of biological conservation values can facilitate the land protection process by enhancing grant applications and inspiring interest from funders. Biological reports can also help defend the project from future legal challenges, which can be of particular interest to landowners claiming tax deductions for the donation or bargain sale of a conservation easement.

Losing species and ecosystems in the name of growth and progress is like selling your organs. You can make a quick buck, but you have lost parts of yourself.

This book reviews free data sources that allow land trusts to assess a wide range of biological attributes easily, quickly, and inexpensively at the very beginning of the land protection process, when such information is most useful. The use of on-the-ground biological inventories is also discussed, including what type of biologist to use, when such studies are recommended, what they should entail, and how to gain the most useful information for the least amount of time and money.

Finally, the book discusses biological reports and how they inform land trust activities, such as project selection, fundraising, drafting conservation easement language, compiling baseline documentation, and writing management plans. The text emphasizes how the biological analysis process can help land trust projects conform to *Land Trust Standards and Practices*, the Internal Revenue Code (IRC), and Internal Revenue Service (IRS) Treasury Regulations, and ultimately contribute to conserving biodiversity.

“This book falls into that rare category of ‘necessary.’ For people concerned about preserving the fabric of this earth in a time of tempestuous change, Chris Wilson has provided a mandatory manual. It will do much good in the world.”

BILL MCKIBBEN, Author of *The End of Nature* and *Deep Economy*, Advisor to Northeast Wilderness Trust

“Everybody talks about saving nature. Here’s your operating manual for getting the job done. It clearly explains how to assess biodiversity on a property, what it takes to maintain or restore it, where to find expert help at each stage, and why this all matters. Add solid advice on subjects from fundraising for projects to complying with regulations, and you have a book that belongs in every land trust office. The sooner, the better.”

DOUGLAS H. CHADWICK, wildlife biologist, author of *The Wolverine Way*, and a founding board member of the conservation land trust Vital Ground.

“This book should serve as an important resource to land conservation practitioners hoping to maximize their conservation impact. It provides a concise introduction to many important facets of the rapidly changing world of biodiversity conservation; where information can be quite powerful, and bringing the right information to your decisions can make all the difference.”

PATRICK COMER, Chief Ecologist, NatureServe

THE LAND TRUST ALLIANCE promotes voluntary land conservation and strengthens the land trust movement by providing the leadership, information, skills and resources land trusts need to conserve land for the benefit of communities and natural systems. www.landtrustalliance.org.

SWEET WATER TRUST is a grant-making foundation whose mission is to support land conservation that safeguards wild lands and waters, native wild flora and fauna, and living soils. Since its establishment in 1991, Sweet Water Trust has been actively involved in conservation work in New England and upstate New York, focusing in recent years on the forests of the Northern Appalachians, including neighboring lands in Canada. www.sweetwatertrust.org.