



# QUANTIFIED

JOE WHITWORTH

Redefining  
Conservation  
for the Next  
Economy



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REDEFINING CONSERVATION  
FOR THE NEXT ECONOMY

Joe Whitworth



Washington | Covelo | London

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*For Liz, Ellie, Anna, and Henry.  
And all others who build from here.*





# Contents

*Note to Readers* xi

*Acknowledgments* xiii

Introduction 1

Chapter 1: A New Conservation for a New Era 7

Chapter 2: Leading in a World of Permanent Scarcity 27

Chapter 3: Holding the Line Is Holding Back Environmentalism 50

Chapter 4: Real Cowboys Fix Rivers 71

Chapter 5: It's the Environment, Stupid 91

Chapter 6: Throwing Money at the Problem (and Missing) 113

Chapter 7: Lessons from an Aussie Water Shock 135

Chapter 8: Getting Clear on the Big Muddy 156

Chapter 9: It's Now and It's Us 179

*Notes* 191

*Further Reading* 219

*Index* 223



## A Note to Readers

As president of The Freshwater Trust, I long ago committed to innovating beyond what was known in order to do what was needed. This led us to engage technology and create new methods to accelerate the pace and scale of restoration of freshwater ecosystems. Where some saw our commitment to experimentation and evolution as bordering on maniacal, others encouraged me to share these new tools with a broader audience by distilling them into a book. Having never written a book, I turned to Andrea Carlos, an accomplished journalist with an abiding interest in conservation, and despite having a farm remodeling project under way at the time, she agreed to help. A superb collaborator, she is a key reason why this project got done. This is how we worked together: After distilling the key elements of the book framework, I laid out the original thought line of how the economy and the environment must integrate in the face of twenty-first-century realities. Thereafter, Andrea and I figured out the right stories, research, and expert interviews needed to create the countless drafts, which we passed back and forth to hone the manuscript into its current state. Although I would not describe the work as easy, we both feel that the partnership rendered some great stuff; we hope you will agree.



# Acknowledgments

I get paid to tell the truth—not necessarily an easy thing in a world that does not always want to hear it but something I feel compelled to do nevertheless. Our ability to do so depends on three basic factors: We need to want to do it, we need to know how to do it, and we need to be in a position to do it. Each of us is a composite of our experiences and relations—shaped greatly or slightly by every single interaction—and book writing is no different. Neither this work nor my perspective would be here without all the arguments, discussions, and learning graciously afforded to me throughout my life. My exceptional mom would say, rightly, that the events and people leading up to this publication are the real catalysts here, and I am forever grateful for what they have given me.

Before writing this book, I did not know what drove me. I did not have a singular, mind-blowing wilderness experience that propelled me into this work but rather a quiet and steady influence from my grandpa and dad, delivered over minutes, hours, days, and years. Neither of them will ever read this book, but both can clearly be read in me. In wrestling with this project, I gained a perspective on my relations with them that will forever guide my mind.

The people I work with provide me with more energy and insight than anyone has a right to, and I count myself fortunate to be able to work with such committed intellect. This includes the staff, top to bottom, of The Freshwater Trust since the day I walked in the door. As individuals and as

a group, we remain interested not in stuff that sounds cool or merely looks good; we need it to work for real. I hope to have the privilege of working alongside many of these colleagues for years to come. Those who directly helped inform and shape this project include Caylin Barker, Brett Browncombe, Matt Desmond, Joe Furia, Marley Gaddis, Tony Malmberg, Adrian McCarthy, Mark McCollister, Jason Miner, Gustavo Monteverde, Jim Myron, David Pilz, Karin Power, David Primozich, Erin Putnam, Nicole Spencer, Haley Walker, and Tim Wigington. The guy who gave me the final push to get it done was Alan Horton, a trusted colleague fully committed to changing the world for the better.

Because my vocation is the avocation of others, I meet folks in a unique head space: They want to bring their intellect and resources to bear on the big problems we face as a society. There have been many who helped along the way, but those who pushed me hardest, informed me best, and supported me unstintingly include Hank Ashforth, Roger Bachman, Reed Benson, Tim Boyle, Andy Bryant, Dave Chen, John Colosimo, Scott Demorest, Rocky Dixon, Matt Donegan, Gary Fish, Paul Fortino, Al Jubitz, Art Kayser, Mike Keiser, Don Krahmer, Randy Labbe, Dave Laurance, Lynn Loacker, Luis Machuca, Marty Myers, Jan Newman, Tim O'Leary, Brad Preble, Scott Sandbo, Bill Smith, Tony Trunzo, John von Schlegell, and David Willmott. I found myself returning frequently to discussions and scenarios with this group as I wrote, and I thank them for their good counsel.

Colleagues and friends both inside and near the conservation community provide a deep well of inspiration, but fixed in my mind are a group whose conversations I turned to repeatedly whenever I had difficulty navigating, which happens when you undertake a book project: Bill Bakke, Ricardo Bayon, Mike Blumm, Fred Boltz, Paul Brest, Alexandra Cousteau, David James Duncan, Marshall English, Peter Gleick, Robert Glicksman, Martin Goebel, John Goldstein, Bill Hatcher, Deb Hatcher, Kenny Helfrich, Rick Henslee, Dan Keppen, Jim Klug, Ben Koldyke, Gregg Lemkau, Ian Lombard, Patrick Maloney, Ned McCall, Nancy McKlveen, John Nordgren, Patrick O'Toole, Wendy Pabich, Dick Pedersen, Jim Prosser,

Andrew Purkey, Dan Rohlf, Jason Scott, Mary Scurlock, Susan Phinney Silver, Peter Stein, Robert Stubblefield, Gene Sykes, Dan Winterson, and James Workman. The beacons provided by this group of advocates, doers, innovators, scientists, and scholars truly kept me focused and the project on track in trying to describe the needed evolutions in accounting, agriculture, economics, and the environmental movement. Any errors, miscalculations, and other such failings are my own.

My editor, Emily Davis, was in many ways the best part of doing this project. Her accessibility and willingness to work through the daunting task of laying out a plan to redesign conservation and integrate it into a durable economy make her legendary in my mind. The most difficult thing I never knew existed—copy editing—was flawlessly tackled by Sharis Simonian. On the marketing side, Julie Marshall and Jaime Jennings made it their jobs to put this book in your hands—they not only did it, they made it look easy. This is my first book, and as publisher, Island Press nailed it.

In the end, I wrote this with not past but future generations in mind. Whenever I came to a point where I could honor those who got us this far while pointing out where we must go next, I did exactly that. But in all conflicts between what we used to need and what we need now, I intentionally sided with those who must face the complex problems ahead: you.





# Introduction

The seeds of my current work were first planted by my grandfather more than 40 years ago. A corn and bean farmer along Blackbird Creek in the Missouri River Basin, he used to say that no man has the right to take more from the land than what the land itself can withstand. Over decades, he learned that if he took care of the land, it would take care of him. In a fundamental way, he understood that commerce and environmental stewardship were forever entwined, that prosperity requires both a strong economy and a healthy environment.

As a young college graduate, I entered a world that sends a quite different message. Not only are the economy and the environment seen as completely separate, but they are *at war*. The message is that you can have either a strong economy or a strong environment but not both. This view of the world has never sat well with me. And when I see evidence that both our economy and our environment are in decline, I'm reminded that Grandpa Whitworth had it right.

Yet despite my grandfather's good intentions, Blackbird Creek has since been listed in violation of the Clean Water Act.<sup>1</sup> In fact, its entire length suffers from agricultural runoff, including the stretch of creek that bordered my grandfather's property. Like most farmers, my grandfather intended to do right by the land. Yet he was caught up in an economy that didn't bother to connect the dots. Fertilizer was cheap. Conventional wisdom was to farm all the way down to the stream. And an ongoing need to

pay off bank loans required him to keep increasing the number of bushels he produced. Unfortunately, my grandfather's experience is still the rule, not the exception, in today's world. It's just the system.

### **A Finite Sandbox**

Like my grandfather, most people do not fully understand or connect their actions to the impact they have on the environment. Producing cheap food requires lots of fertilizer and pesticides. And because we all enjoy cheap food, our nation's rivers are literally choking from these nutrients. Take the Mississippi River, for example. The world's fourth longest river, it has become so saturated with fertilizers from agricultural runoff that every year it creates an enormous water ghost covering as many as 8,000 square miles—the size of New Jersey—where the river drains into the Gulf of Mexico. Within that dead zone, there's not enough oxygen to sustain fish or other marine life. In their place are enormous quantities of toxic algae, leaving an ugly layer of scum to shadow the depths below.

We're taking more from the land than it can withstand, and in the long term that's bad for the economy. With the world's population projected to reach 10 billion by 2050, we'll have more people to feed, clothe, house, and employ than in any time in human history. *And then we'll have to do it every year thereafter.* That means we cannot undercut the resource base from which we draw. We have a limited sandbox in which to play. Our natural resources are finite. They are the basis of our prosperity; we can't just use them up.

Yet that's exactly what we've been doing. In the last 150 years since the Industrial Revolution, we've focused almost exclusively on growing our economy, extracting whatever we need to do so at the expense of the environment. And now we're at a point where the environment is hurting—seriously hurting. Setting aside all romantic reasons for saving nature, the fact is, we cannot have a thriving economy without a resilient resource base underlying it. It just won't work. We need basic systems operating properly, and right now, they are deeply compromised as a result of humans making a living on Earth.

We're in a game of catch-up, and to restore the right balance, we must train a laser focus on achieving gains for the environment in the same way that we've obtained financial gains in the past. Simply put, we have to rebuild the health of the environment on whose services both our economy and our very existence depend. In my mind, this is not a war where we must halt the evil economy in the name of a beautiful environment as foretold by eco-warrior legend. This is an obvious imperative.

### **Busywork or Actual Results?**

Growing up in a small town in downstate Illinois, I was also influenced by my dad, a carpenter. I spent my summers as a grade-schooler earning a dollar a day running back and forth to the truck getting the right tool for the job at hand—a great way to understand the tools and learn the trade. The way it worked was pretty simple. People called my dad when they had a problem. We would show up on the job site, check out the situation—the gutter would be broken, the roof would be leaking, the floor would have fallen through—and if Dad did his job right, the problem would be fixed by the end of the day. But if we walked off that job site and the problem wasn't fixed, we'd have to come back the next day and then the day after that until it was. Dad didn't get paid unless and until he fixed the problem.

Being exposed to job site after job site all the way through high school, I learned that when there's a problem, you fix it. Yet when I started working on water issues, I soon recognized that we weren't getting the job done. Yes, we were raising money every year. Yes, we were staying busy. Yes, we were helping. But we weren't actually fixing the problem.

When you're a carpenter, the first thing you do is size up a problem. Is it a leaky roof or a cracked foundation, and what tools do I need to fix it? Sizing up our twenty-first-century water problems, I eventually reached the conclusion that the tools we've been using aren't enough to solve the challenges we face. It's like trying to paint an entire house with a 1-inch paintbrush when what you really need is a spray gun. In the same way, the tools we're using to protect the environment aren't getting us where

we need to be. Despite the hard work by a lot of uber-smart, totally dedicated, gifted people, the reality is that we're not achieving the gains we need for the environment. In fact, the environment continues to lose ground at a rapid pace.

### **Taking a Quantum Leap Forward**

I have written this book for the same reason that I work on water issues: I want to take my grandfather's good intentions about the environment and convert them into action while still allowing people like him to earn a decent living. And I want to harness my dad's fix-it work ethic to restore our rivers and streams within my lifetime. Unless we change the course we are on, we simply won't get it done.

There's an incredible array of tools available to us, but we have yet to seize them. Instead, we remain stuck in Conservation 1.0—an unacceptable rate of innovation for smart folks living in the age of Google. Most of the major advances the environmental movement has made date back to the 1970s, when the Clean Water Act was passed and issues such as clean water and air drew national attention. True, there's been a tremendous amount of advocacy and litigation since then. But the improvements have been incremental. Perhaps we've moved on to Conservation 1.1 or 1.2, when what we really need is a quantum leap forward. The bottom line is that the environmental movement hasn't been innovative, and we need to be innovative if we're to address the complex environmental problems in front of us.

To use an example that most environmentalists hate, consider the oil and gas industry. Historically, oil was extracted by drilling vertically. Vertically, vertically, vertically—for more than a century. But over time, the work the industry could get done diminished. The oil began to dry up, and the return on investment began to decline. Rather than throwing up their hands, oil and gas executives regrouped and innovated. They looked sideways at the issue and came up with a new way of getting at the oil that involves drilling horizontally rather than vertically. No matter how you

feel about the substance of this example, you cannot argue with the form. Horizontal fracking opened up a whole new oil boom.

In the same way, we need to realize that the same old environmental playbook is no longer working and find a way to open up new possibilities. We've spent the last 45 years using the same old tools and strategies, even as the return on our investment has diminished. Yet drilling down harder on our problems using these same methods isn't going to work. We've got to wake up and realize that we're not getting at the issue and that we have to move sideways, at an angle, or in some other way. In short, we need to tackle our environmental problems from a different direction, and that requires a brand-new approach.

Whatever our role working on environmental issues, we must all have a come-to-Jesus meeting with ourselves and our organizations. We must take a hard look at where we're at, admit where things aren't working, and then revamp our approaches to get the results we want. And we must innovate and measure our results to make sure our chosen path is working.

*Quantified* is about doing exactly that. It's about changing our approach to conservation on a fundamental level. It's about widening the focus to bring about environmental gains alongside the financial ones that have been the central emphasis of our global economy. And it's about moving past the current "let's stop more bad things from happening" mentality to achieve lasting, quantifiable improvements for the environment. Although many of the examples in this book come from my field of focus, water, the principles of quantified conservation apply to environmentalists working on any issue. They also apply to the entire spectrum of players concerned about the environment, including government administrators, farmers and ranchers, business leaders, philanthropists, social investors, and anyone who cares about bringing about a more prosperous future.

We humans can do astounding things when we focus on challenging problems. Not all the obstacles may be known or the details written down, but we have the tools we need to start the journey. What is certain is that we cannot afford to stay stuck in an extraction-based past that

treats our natural resources as limitless. We must forge ahead and create a conservation-based future that balances a prosperous economy with a thriving environment. And we can. By reading this book, I hope you will walk away with a strong set of organizing principles with which to evaluate our present crisis and build a more resilient future.

## A New Conservation for a New Era

IMAGINE WALKING INTO a job interview at a major manufacturing company. You've already gotten the tour of the administrative offices and are surprised by the absence of modern technology, let alone the large stacks of papers heaped on employees' desks. You've just completed the interview, answering all of the CEO's questions. Now it's your turn to ask some questions.

"Of all the widgets you manufacture," you begin, "which have been the most and least profitable?"

"I'm not sure," the CEO says.

You try to hold back your amazement. "Who are your biggest competitors?" you ask.

"Oh, there's a handful," she says, her voice trailing off.

You shift in your seat, trying to hide your discomfort. "What are your long-term goals for the company, and what threats could undermine your success?"

"We've been meaning to develop a business plan. It's just that we've been so busy managing our day-to-day affairs."

In today's world, it's hard to picture a business of any kind making these mistakes. What twenty-first-century corporation could survive if it neglected to define its objectives or analyze its progress? How long would it take for a business to tank if it failed to gauge market trends?

Yet this is exactly the way we approach our environmental problems. We lack real awareness of the situation; we don't fully understand the current state of our natural areas or what our actions might mean for their future. We don't precisely define our goals for improving the environment or use innovation and technology to help us achieve them. Nor do we adequately analyze our progress to make sure we're obtaining quantifiable results. It's like driving without a dashboard. We don't know how fast we're moving or whether we'll ever reach our destination.

The consequences of the current approach are devastating. Despite well-intended efforts by numerous environmentalists, policymakers, and philanthropists, the health of planet Earth continues to deteriorate at a startling rate. Sure, the environmental movement has won many notable battles. Yet, over time, the significance of these wins has declined to the point where we are now rapidly losing the war. Although today's environmental realities have changed, modern environmentalism keeps plugging away with the same outdated toolkit, and it is reaping an ever smaller return on its investment.

So how has the situation changed since the dawn of the environmental movement? Consider the following:

- World population has doubled to 7.2 billion.
- U.S. population has grown by more than 55 percent to 316 million.
- The amount of pesticides used in the United States has tripled to 1.1 billion pounds per year.<sup>1</sup>
- The number of worldwide dead zones has spiraled from roughly 30 to more than 500.<sup>2</sup>
- The total number of freshwater species has declined by 50 percent.<sup>3</sup>
- Global Atlantic salmon catches have fallen by 80 percent.<sup>4</sup>
- Total acreage of U.S. wetlands has decreased by more than one third.<sup>5</sup>



- The amount of U.S. land consumed by urban development has doubled.<sup>6</sup>
- Annual carbon dioxide emissions that contribute to global warming have risen by more than 80 percent.<sup>7</sup>

If a time machine landed a human being from 1970 on today's planet, this passenger would find himself thrown into an almost unrecognizable world. The planet we live on today is dramatically different from that of a generation ago, when the modern environmental movement was born. To address today's realities, we need a radically different approach, not just an extension of the one we've used in the past.

To put it bluntly, we need to wake up and smell the future—because it's already here. We have entered a new environmental era, one with far more daunting problems than we faced 50 years ago. Yet we continue to muddle along like the manufacturing company described at the beginning of this chapter, doing things the same old way, failing to adapt to the new reality before us.

Adapting to the new reality requires implementing bold, innovative approaches that are a true match for the severity of the problems we face. It also means being adamant about obtaining results. For the environmental movement to continue to be relevant, it needs to remake itself into a more agile force that continually reevaluates the current situation and then adapts its practices to achieve the highest possible return on its conservation efforts.

It's not just environmentalists who need to change. Governments and philanthropists working on these issues need to get serious about demanding results. And agriculturalists and businesses need to recognize that it's in their own interest to conserve natural resources on which their livelihoods depend. If we're to survive a future in which 10 billion humans call planet Earth home, we must all work to solve our problems, and we need to begin now.

The good news is that, with the right focus and tools, we can achieve a more resilient environment. Think about all the human and financial