

Introduction to Natural Resource Planning



Charles Yoe



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Preface

Here are three things you should know about this book: First, it was written to help keep the art and practice of planning alive. Second, it is not terribly academic. If it is terribly anything, I hope it is terribly practical. Third, I did not want to write it alone and as it turns out I did not.

Here's how I became a planner. Ed and Dave were setting up a keg of beer in the office as I walked to my job interview in the evaluation and economics branch of the Planning Division of the Baltimore District of the U.S. Army Corps of Engineers. It was the morning of the office Christmas party way back when people had kegs at office Christmas parties. I thought I might like it there even before the interview began. I did. That job was the most fun I ever had in an office. I signed on as an economist but within a year I was a planner; not a good one, but an enthusiastic one. I like to think I got better as I went along.

If I did, it was because of Bob, Mr. T, Nels, Harry, Stu, Ken, Milt, Dan, Raleigh, Ed, Dave, Ron, Steve (God rest you, friend), Phil, John, Mike, George, Cliff, T, Tom, Johnny, Pearl, Al, and Ed. It was the seventies, and there were few women planners. Women were still secretaries, and Paula, Patty, and Sandy were as good as the best planners in the office. They are all, in many ways, the coauthors of this book. I learned from them and I learned with them and it was exciting, important, and fun.

I wanted my good friend, Ken Orth, to write this book with me. He is a world-class planner. He has thought about the “stuff of planning” throughout his career, and he is smarter about how to actually do planning than anyone I know. We wrote a planning manual together many years ago. It was good work. I thought we might have a little more good work left in us, so I lured him to my house in Maryland from his house in Georgia one day and plied him with some very good black lagers. He turned me down. The Beatles were his first love, and he has been documenting Beatle album (plus) parody art for years. That project was more important than the tedium of a textbook—go figure.

The truth is this book would not exist without him. His voice is heard throughout it. There is no part of this book he has not touched. Perhaps the only good thing about his declining to join me formally is if he had we'd likely still be arguing the value of the all possible combinations formulation method or whether compare and contrast are two separate activities or one and the same. He's the Beatles, I'm the Stones. He read the draft and told me what sucked and what was good. I almost always took his advice, but I did keep some of the parts he said sucked, and I hope he was wrong about them. I cannot thank him enough for his lists of things, the arguments, the agreements, the collaboration and support, but most of all the friendship. I am most grateful for the opportunity to have worked with him and hope to do so again in the future.

This is not a very academic book. You will be appalled at the paucity of references you'll find, so let me try to explain that. When I decided to write this book, I thought I'd start by defining planning. About 20 pages in, with dozens

of articles cited, I still didn't have a satisfactory definition. It was then I decided I didn't want to write that carefully researched book and I figured you didn't want to read it either. My experience says planning is (or ought to be) standing in the present and envisioning the possible futures for the purpose of finding a route to one that appeals to us. That same experience also says there is no one right way to do planning, but there are a whole bunch of wrong ways and if you don't know for sure exactly how you're doing it you're likely to end up doing it one of those wrong ways. And so, I wrote from experience, but not necessarily my experience. It is more the experience of all the planners I benefited from working with.

I have tried to keep this text practical, almost, but not quite, a "how to" manual. The examples draw heavily on my water resources planning background. I am sorry if I missed your interest area, natural resources planning is just too broad, and I hope that does not get in the way of your understanding. I should leave planning history to the scholars, but it seems to me planning was once going to solve a lot of society's problems. There was a great period of planning that seemed, in the final quarter of the last century, to give way to brute force politics and the economic and other exigencies of globalization. During that time, planning often felt devalued to me and I fear, but cannot prove, that we began to lose some ability to practice the art of planning. This book was written to help prevent that from happening.

In 2007, Congress asked the U.S. Secretary of the Army to revise the nation's water resources planning guidance. Several draft versions were created with significant changes. Missing from the drafts was the how to do it piece. Leaving a variety of agencies to figure out how to implement the policy was a bit unnerving coming off a few decades during which planning practice seems to have regressed. That got Ken and me to thinking about how our own thoughts on the art of planning had evolved and changed and it looked, to me at least, to be a good time to put it all in writing.

This feels to me like an exciting time to be doing planning again, especially natural resources planning. There are amazing technologies available to planners, and there is a wide and growing array of fascinating resources problems and opportunities that need our attention. Resource planning issues are being taken up by private and public interests all over the world and at all levels of involvement. The only thing that seems missing is some of that communal experience we had begun to lose. Keeping that flame alive is the real purpose of this book.

I want to repeat, there is no one way to do planning but there are some better ways and they should not get lost. Planning policy and procedures sometimes seem to threaten the art of planning by strangling the fun out of it. That ought not to happen. So it seems to be a good time for an art and practice of planning textbook. Here, you'll find a process I have named "Five By Two" (an oblique Rolling Stones reference) that I hope planners from outside the natural resources arena will find useful as well. Good planning is just good planning.

Planning is important work. It is social decision making. It changes lives. It forms the future. It is a career where you ought to have fun. Every planner, but especially young planners, ought to be able to feel excited about the important work they can do. This book is by the past keepers of that flame, and it is for the future keepers of that flame.

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Charles Yoe, PhD, is a professor of economics at Notre Dame of Maryland University and an independent risk analysis consultant, but at heart he is a planner and educator. He began his planning career with the U.S. Army Corps of Engineers and has since worked with a number of U.S. and other government agencies as a planner, consultant, risk analyst, and trainer in a wide range of areas touching natural resources, including food and feed, natural disasters, public works infrastructure, homeland security, ecosystem restoration, resource development, biotechnology in crops, all manner of water resources, ecosystem services, and the like.

Envisioning the Future



We live in an uncertain world. Even in a world of perfect certainty—where we knew the truth of climate change, the future price of energy, or the outcome of the next election—planning for that future would be a difficult challenge. We would still have to deal with differing social values. But the world is not certain and planning is all the more difficult, important, and necessary because of this simple fact. Planning is one of our most underrated means of social intercourse and collective action. Planning gives us the ability to envision the future through all the uncertainty. Done well, it empowers us to choose a better future.

1

The genesis for this book is steeped in the water resources planning policy of the U.S. government. For much of my career that policy was articulated in something called “the P&G” (Water Resources Council 1983). The P&G articulated principles and standards for water resources planning. They also offered a rather serviceable six-step planning process that I have spent years unpacking with friends and colleagues for ourselves and others (Yoe and Orth 1996; Orth and Yoe 1997). In Section 2031 of the Water Resources Development Act of 2007, Congress directed the Secretary of the Army to revise the P&G. This book is written, in part, to try to get planning right in case the bureaucrats in Washington don’t.

This book is about small “p” planning. This includes the principles, standards, process, and practice of planning; it’s what to do and how to do it. It is the art and practice of planning. Capital “P” Planning is the policy guidance of organizations, the budget process, the necessary administrivia that is sometimes important but not nearly as much fun as planning. This book is not about Planning.

Why natural resources planning? The simple answer is that there are a lot of people all around the world doing it with varying degrees of success. We care about it, and it is important.

Another reason for a natural resources planning book is that it is good to be green these days. I came of age as a planner during an exciting time when the National Environmental Policy Act of 1969 was just beginning to have some impact. Planning was exciting and vital, and it was fun to do. Then planning entered its Muppet Age, when Kermit spoke for many natural resource planners when he sang, “It’s not easy being green.” The economic exigencies of the 1980s devalued planning at the national level.

The beautiful thing about planning though is that we really do need it. The streamlined devalued version of the last decades of the twentieth century did not solve all the problems and lead us to a greener future. Now we see people who don’t even know they are planners springing up all over the nation. They are planning at the national, state, and local levels. They are planning in nongovernment organizations (NGOs) and in their communities.

Natural resources planning is where the past, the present, and the future all converge, with no less than the future of the planet in the balance. That makes it vital and important. This is an area with more sexy issues than the TMZ website. Just think about it. We’ve got climate change, sustainability, biodiversity, oil spills, tsunamis, nuclear disasters, brownfields, carbon footprints, a growing population, people wanting to eat locally, debates about drilling, and concerns about natural resource adequacy and rates of resource use, and that is just for starters. Managing natural resources is a concern of every national, state, and local government in the world. Land use and conservation, water use, pollution, energy issues, natural hazards, and development of natural areas fill headlines somewhere every day. Fascinating new

issues continue to emerge as we seek to identify and preserve natural DNA, struggle with invasive and nonindigenous species, and worry about the well-being of native and managed pollinators. Our awareness of the value of unique assets continues to grow and convert new followers, whether it is generic topics like agriculture, beaches, fish, groundwater, habitat, livestock, rivers, sanitation, wastewater, and wetlands or specific treasures like the Everglades, the Gulf Coast, Puget Sound, salmon in the Columbia River Basin, Asian carp headed toward the Great Lakes, or the woods a few blocks from your home. These are among the most important issues that current and coming generations face.

Natural resource issues intersect with many technology issues. How will mini-chromosome technology affect our environment? Genetically modified food and feed are already staples in many countries. Nanotechnology will enable us to create legions of new solutions to once-intractable problems. Particles and filters can bind with or remove inactive pollutants. Renewable energy is changing the landscape. More-efficient uses of resources are being discovered every day. Natural resources are one of the hottest topics on the planet.

How will society respond to these challenges? By what means shall we organize to answer them? Natural resource issues will be nudged off the front pages by geopolitical events and the latest celebrity meltdown or athlete screwup, but they are not going away. Neither will these problems stay the same. Something is going to happen, and if we want a say in what that something is, we need to begin planning. That is why this book exists.

Planning is a ubiquitous human endeavor. We have urban planning, strategic planning, military planning, financial planning, and don't forget wedding planning, just to name a few. So if you read with one of these interests, welcome to planning. Although the examples here come from the world of natural resources planning, you'll find the methods presented as applicable to your interests as they are to natural resources, with the possible exception of wedding planning, where we yield to the experts. Planning is standing in the present and peering off into a vast array of uncertain futures that stretch ahead of us, for the purpose of choosing the direction that best suits the needs of those for whom we plan. It's time for us to begin to envision the future.

1.2 UNCERTAINTY

One of the emerging constants in the modern world is uncertainty. Growing social complexity and an increasingly rapid pace of change are normal parts of the decision-making landscape, and they contribute a great deal to the uncertain environment in which we all operate. Planning for an uncertain future presents a viable alternative to drifting through an uncertain environment.

The world grows more complex. Think of complexity as a social phenomenon. It refers to the size of a society, the number of its parts, the distinctiveness of those parts, the diverse specialized social roles it incorporates, the number of distinct social personalities present, and the variety of mechanisms for organizing these into a coherent, functioning whole.

As a species, we have spent virtually all our history living as low-density foragers or farmers in egalitarian communities of no more than a few dozen persons and even fewer distinct social roles. In the twenty-first century, we live in societies with millions of different roles and personalities. Our social systems grow so complex they defy understanding. Solving the ill-formed problems of natural resource use and preservation in such a world grows correspondingly complex.

Added to this growing complexity is an increasingly rapid pace of change in almost every arena of human endeavor. Scientific breakthroughs make things once impossible to conceive commonplace. These “things” include disasters and challenges as well as delights. Much of this change is driven by rapid advances in technology. Technology changes social values and beliefs as well as the way we live, work, and die. The level of complexity in our social, economic, and technological systems is increasing to a point that is too turbulent and rapidly changing to be predicted by human beings. The impacts of this rapid change on natural systems are often poorly understood, if they are understood at all.

Rapid increases in social, economic, and technological connectivity are taking place around the world, shrinking, uniting, and dividing the globe at a dizzying pace. Social movements, for example, environmentalists, women’s rights, World Trade Organization opposition, the Occupy movement, and the like are global in their pervasiveness. We are increasingly a global economy. Fashions are designed in New York, approved in London, patterns are cut in Hong Kong, clothes are made in Taiwan, and sold in Europe and North America. A computer virus spreads around the world in hours. A human virus spreads in weeks or months. An oil spill in the Gulf of Mexico, a tsunami in Japan, or a flood on the Mississippi River reverberate through our global society and its ever-more-integrated economy.

Social values change unpredictably and constantly. The resource fixes of the past are often the problems of the present. Efforts to drain the swamplands in Southern Florida, in part to increase agricultural land to enable us to support our European allies during a century of World Wars, have now become a threat to one of the world’s most productive ecosystems. Taming the Wild West, straightening our meandering rivers to improve navigation, and clear cutting forests for farming and housing are values of the past that have contributed to the problems of the present. No doubt many of the values of the present are already seeding the resource problems of the future. Fields of wind turbines produce renewable energy but threaten the migratory patterns of birds and vistas undisturbed since creation. Who knows how they will be judged by society in 30 years?

The United States can no longer as confidently lay claim to the Judeo-Christian ethic. Families are more diverse than ever. The Census Bureau said, “Married couples represented just 48 percent of American households in 2010.” Politics remains as divisive as ever. Wildlife and environmental resources now have numerous interest groups supporting both their harvest and their preservation. We are better educated than ever, with a greater divide between the most and least educated among us. Values are in conflict even when consensual views of problems may exist, and that is not nearly as frequently as we’d like. Discerning the uncertain values that decide issues is one of planning’s greater challenges.

Relentless pressure on costs is a fixture in all public decision making. Faster, cheaper, better is the mantra of far too many organizations that have not thought carefully about what that means for the present, much less for the future. We have entered a world where irreversible consequences, unlimited in time and space, are now possible. This is or should be extremely important to resource managers in both the public and private sectors. Decades after the accident at Chernobyl, some of its victims have yet to be born. Many of the wicked resource problems* we face can have a long latency period.

Many of our country's landscape-scale ecosystem restoration problems, like those in the Florida Everglades, coastal Louisiana, and the Columbia River Basin, as well as global concerns like greenhouse gases and climate change, provide clear examples of problems that took decades to emerge and be recognized. The implications of the solutions being formulated may similarly take decades to be understood.

A new phenomenon of "known unawareness" has entered our lexicon. Donald Rumsfeld in November 2006 summarized this truth to scattered laughter when he said:

There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we now know we don't know. But there are also unknown unknowns. These are things we do not know we don't know.

No one is laughing anymore. As a society, we are beginning to realize that despite all we know, the unknown far outweighs what is known. Knowledge is as much to create more questions as it is to provide definitive answers.

Clearly scientists now know much more about bovine spongiform encephalopathy (BSE, or mad cow disease) than when it was first found in cattle in 1986. Even now, decades after the disease's discovery, its origins, its host range, its means of transmission, and the nature of the infectious agent and its relation to its human-counterpart variant Creutzfeldt-Jakob disease remain mostly unknown. We have begun to suspect that some problems are so complex there may be no narrative closure, no ending by which the truth is recovered and the boundaries of the problems established.

Although most of us live and work in nations, our interactions and our problems are increasingly global in nature. It becomes more difficult to affix responsibility for resource problems and their solutions. Who is destroying the ozone, causing global warming, and spreading BSE? What is happening to polar ice caps and aquifers? What is the future of our resource deposits as once sleeping giants like China, India, and Indonesia grow in affluence and expectations of a better standard of living? Meanwhile, familiar old problems like flooding continue to claim mounting numbers of casualties around the world.

Despite the world's rapid advances in all kinds of sciences, we are increasingly dominated by public perception. Public perception is a palpable force and in some circumstances it is an irresistible one. It can also be an ignorant force. When those

* Wicked problems are complex but ill-formed problems that lack right and wrong solutions. Instead, there are many candidate solutions where some are better and some are worse than others.

who benefit from a situation differ from those who pay the costs, the conditions are often considered unacceptable regardless of the facts of the matter. All resource issues have a social context. It is folly to regard social and cultural judgments as things that can only distort the perception of reality. Social and cultural judgments shape reality, and neither they nor the people who hold them can be ignored.

One result of this not uncommon disconnect between the scientific facts of an issue and its social context is that possibility is often accorded the same significance as existence in the public's view. This view has found its way into some public policy. This is in part because many things that were once considered certain and safe, and often vouched for by authorities, turned out to be deadly. The BSE experience in Europe, the SARS experience in Asia and elsewhere, the failed levees in New Orleans, the melamine contamination from Chinese products, the size of the Gulf oil spill of 2010, and the 2011 nuclear disaster in Japan provide vivid examples of this. Applying knowledge of these experiences to the present and the future devalues the certainties of today. This is what makes conceivable threats seem so possible and what fuels our fears of uncertainty. It is also what makes criticism of a decision that masquerades as certain embarrassingly easy.

Responsibility in this more connected world has become less clear. Who has to prove what? What constitutes proof under conditions of uncertainty? What norms of accountability are being used? Who is responsible morally? And who is should pay the costs? These questions plague decision makers nationally and transnationally.

We all live and operate in this uncertain reality. Yet many organizations and individuals cling stubbornly to a short-sighted, present-oriented, and deterministic approach to decision making that belies the experience of public and private sectors worldwide. Decision making needs a future-oriented "culture of uncertainty." Risk-informed planning* helps to build such a culture.

The future is fundamentally unknowable. There must be recognition of the central importance of demonstrating the collective will to act responsibly and accountably with regard to our efforts to grapple with this fundamental uncertainty and the inevitable wrong decisions and losses that will occur despite every best effort to account for this uncertainty. In an uncertain world we cannot know everything and we will make mistakes despite our best efforts to the contrary. This is the challenge that invites planners to reclaim an important social role as guardians of the future.

Planners operate in this complex and uncertain global environment, where values are fungible and tomorrow is unpredictable. Now add to this the more pragmatic concerns that challenge planners. There is never enough data. The theory, scenarios, and models they rely on are rarely complete. It is precisely because the world of planning is so uncertain that we need a systematic process that is intentional about identifying critical uncertainties and taking them into account in decision making. Planning, when it incorporates the best practice of risk analysis, offers society a rational approach to envisioning the uncertain future.

* This is planning that is intentional in honestly assessing and addressing the uncertainty that exists in the planning context.

1.3 NATURAL RESOURCES

Natural resources are physical assets provided by nature. Biotic natural resources include all living things. Plants, animals, and fossil fuels comprise this category. Abiotic natural resources are nonliving things. Land, water, air, and minerals in all their forms make up this category.

Most definitions of natural resources include some reference to their occurrence in a natural state as well as their economic value. Natural resources provide a flow of services essential to human life. Natural resources include the assets themselves, their amenities and attributes, and the services that flow from them. They can have functional value, seen in their usefulness in producing some other goods or services; aesthetic value in their mere existence; and moral values that require no further justification (Eriksson and Andersson 2010). These values benefit humans by improving human welfare and developing human capabilities (Edward-Jones et al. 2000). They can benefit all sentient beings that can experience pleasure or pain (Singer 1976). Teleological biocentrism argues that anything with an organic development path can be considered a benefit. Taylor (1986) has called this a “theory of respect for nature.” An ecocentric view considers concern for entire species or ecosystems (Eriksson and Andersson 2010). This book embraces all these views of natural resources for planning purposes.

Natural resources offer a staggering array of commercial, recreational, aesthetic, and ecological services. Figure 1.1, adapted from the World Wildlife Federation’s Living Planet Report 2010, shows the interconnections among people, natural

ECOSYSTEM SERVICES

Ecosystem services are defined as the benefits that people obtain from ecosystems (Millennium Ecosystem Assessment 2005). Four major categories of services are usually identified. *Provisioning services* are provided by the goods obtained directly from ecosystems. These include food, minerals, water, medicines, timber, fossil fuels, and the like. *Regulating services* are provided by ecosystems when waste is decomposed, carbon is sequestered, water is filtered, crops are pollinated, and climate is regulated. *Supporting services* necessary for the provision of all other ecosystem services are another major benefit category. These support services include such basic ecological functions and processes as nutrient cycling, photosynthesis, and soil formation, which make many of the other services possible.

The *cultural services* of ecosystems provide the psychological and emotional benefits humans realize when they interact with and relate to ecosystems. These benefits include recreational experiences as well as aesthetic and spiritual experiences.

Source: World Wildlife Federation. 2010. *Living Planet Report 2010 Biodiversity, Biocapacity and Development*. Gland, Switzerland: WWF International.

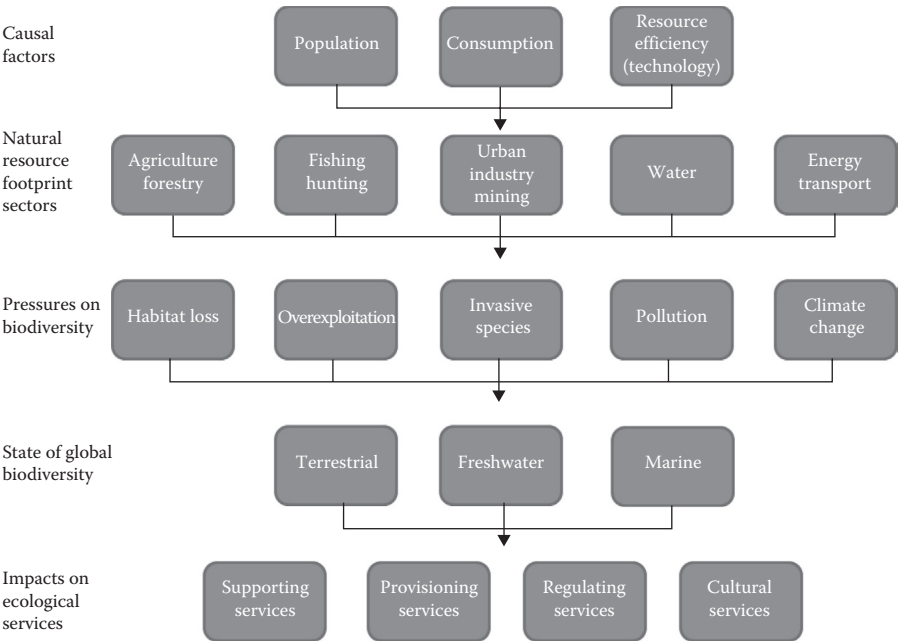


Figure 1.1 The role of natural resources in the production of ecosystem services. (Adapted from World Wildlife Federation. 2010. *Living Planet Report 2010 Biodiversity, Biocapacity and Development*. Gland, Switzerland: WWF International. With permission.)

resources, and ecosystem services. Maintaining the flows of those services is a primary challenge for planners. Battelle identifies two major natural resource tasks for governments. The first of these is determining how to clean up legacy problems, restore natural resources, and achieve human health protection. The second is designing strategies to allow for future growth while protecting the environment, maintaining biodiversity, safeguarding human health, and preserving cultural/social values (Boehm 2003). These tasks are integral components of the natural resources planning tradition.

The Global Environmental Outlook 2000 (UNEP 1999) identifies a wide variety of global legacy problems, including:

- Impacts of anthropogenic emissions of greenhouse gases on the atmosphere.
- Ground-level ozone, smog, and fine particulates.
- Overexploitation of surface water resources and aquifers.
- Deaths from water-related diseases.
- Biological diversity is under increasing threat.
- Land degradation continues to worsen.
- Many remaining forest ecosystems have been degraded and fragmented.
- Crop- and livestock-related buildup of reactive nitrogen in the global biosphere, contributing to the acidification and eutrophication of ecosystems.

- Urban air pollution and deteriorating water quality have major health, economic, and social impacts.
- Natural disasters are increasing in frequency and intensity.

Global issues for this young century are many and have been described as clustered in three groups. These are unforeseen events and scientific discoveries; sudden, unexpected transformations of old issues; and already well-known issues to which the present response is inadequate (UNEP 1999). The Scientific Committee on Problems of the Environment (SCOPE) of the International Council for Science asked 200 scientists from 50 countries what environmental issues are likely to require attention in the twenty-first century. Most of their responses reflect existing problems that receive inadequate attention. Figure 1.2 shows selected issues identified by SCOPE.

Local issues mirror global concerns and add countless variations of other concerns, including timber management, resources in urban areas, park management, forest management, recreation, biodiversity, wildlife, habitat, water quality, fisheries, flood risk management, grizzly bear recovery, invasive species management, water rights, reallocation studies (reservoirs and treaties), greenways, bike trails, nature

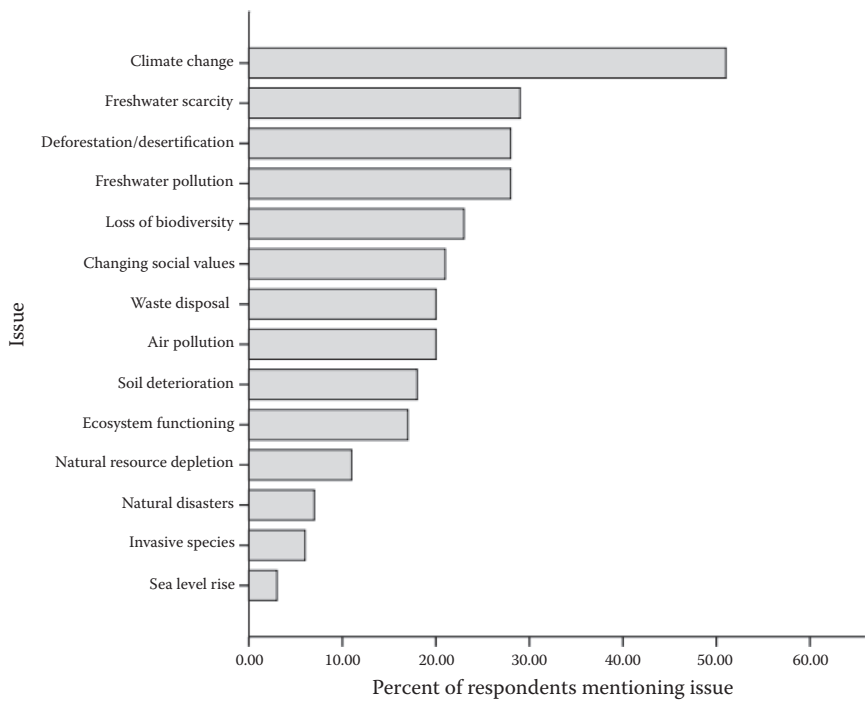


Figure 1.2 Selected environmental issues of the twenty-first century from the Scientific Committee on Problems of the Environment (SCOPE) survey. (Derived from United Nations Environmental Programme (UNEP). 1999. *Global Environment Outlook 2000*. Accessed July 23, 2011, <http://www.grida.no/publications/other/geo2000/>.)

walks, natural resource management, cultural resource management, energy security, poverty reduction, peregrine falcon management, adapting to climate change, food production, burro management, hazardous trees, fire management, freshwater, provision, and on and on the list goes.

1.4 PLANNING IS ...

Planning is not easy to define in a way that will please many, much less all people. Wildavsky (1973) wrote when central planning was very much a world force to be reckoned with and when national planning gave planning much more cache than it has had in recent years. In his article “If Planning Is Everything Maybe It Is Nothing,” he described planning as future control, as cause, as power, as adaptation, as process, as intention, as rationality, and as faith. But he does not drive a stake into the shifting sand and define it. It seems easier to wax on about planning than it is to define it.

So let me define planning for natural resources and get that nasty task out of the way. In 1996, a friend and I defined planning as the deliberate social or organizational activity of developing an optimal strategy for solving problems and achieving a desired set of objectives (Yoe and Orth 1996). Today I prefer to say planning is thinking carefully about the future and how best to get to the most desirable future from the present. Its purpose is to envision and shape the future by anticipating, identifying, and solving problems as well as seeking and capitalizing on opportunities. This book is about the process by which we do this for natural resource issues.

A review of the literature, by the way, revealed a wide range of opinion and very little consensus on what planning is. I'd summarize the views as roughly these. Planning is

- Basic human activity
- Rational choice
- Control of future action
- Complex problem solving
- What planners do

Some see planning as a basic human activity that pervades our behavior at every level of society. In this view, planning is a process of human thought followed by action based upon that thought. This makes planning a very general human activity. You plan what to wear to work, the route you take to the office, and what you will do during your day. This also makes planning very ordinary. Those who do not plan in these ways might seem to drift through their days. Although everyone plans like this, few do it as well as professional planners.

Planning can be seen as a matter of deliberate choice. It is a process for determining appropriate future actions through a sequence of choices. It is a structured rational approach to achieving desired ends.

Closer to my own favored view is planning as an attempt to control future consequences through present actions. This view fuses planning and action together, for

PLANNING IS NOT ...

Planning is not budgeting, scheduling, and related reporting, but these are project management activities. They are important, but they are not planning. Neither is planning the legally mandated coordination and consultation with other agencies and groups. When these are proscribed exchanges of correspondence, reports, meetings, and the like within proscribed time frames, it is procedural administration. Planning is not conducting technical studies. The hydrology, design, geotechnical, biology, water quality, cultural resources, and all the other analyses are all vitally important support functions, but they are not planning either.

if we do not implement a plan, there can be no control exerted over the future. Some would measure the success of planning by the future consequences we are able to influence or control.

Another line of thought is that planning is problem solving that is aimed at very particular kinds of problems. Planning theorists have often defined the problems they deal with as ill-structured or wicked problems, that is, problems with no clear answers. Most natural resource problems are wicked problems.

Planners help decision makers identify their problems, conceive solutions to them, and compare the importance of the inevitable conflicting values inherent in any solution. This is a simple and intuitive definition with which many natural resource planners can identify. The job is unique. It differs so much from day-to-day that it defies a definition more precise than planning is what planners do.

Each definition offered here is like a point in a pointillist painting. No one of them alone is very enlightening, but taken together they provide a reasonable representation of what planning is.

1.5 ORGANIZATION OF THIS BOOK

This text is about how to plan. It is applied planning, that is, good planning practice. It is based largely on what others have taught me, mistakes I have made, and occasional good ideas I think I have had. It is not the academic prototype that reviewed every bit of literature on every topic. There are books and articles that do that far better than I ever could. What you do get here are these 16 chapters:

- Chapter 1: Envisioning the Future
- Chapter 2: A Team Sport
- Chapter 3: The Planning Process
- Chapter 4: Establish the Decision Context
- Chapter 5: Gather Evidence
- Chapter 6: Formulate Solutions
- Chapter 7: Evaluate Solutions

Chapter 8: Compare Solutions
Chapter 9: Make a Decision
Chapter 10: Public Involvement
Chapter 11: Tell Your Story
Chapter 12: Uncertainty
Chapter 13: Scenario Planning
Chapter 14: Economics for Planners
Chapter 15: Fast Planning
Chapter 16: Practical Tips

Chapter 2 begins with the people who are indispensable to planning: the planners. Planning is indeed a team sport, and good teams do not occur by accident. Chapter 3 discusses the notion of a planning process and offers several examples, including the P&G mentioned earlier in this chapter. The P&G planning process is the parent of the planning process presented in this text, which I call “Five By Two” for the five steps and two ongoing processes that comprise it.

Chapters 4 through 10 constitute the heart of this book by devoting a chapter to each of these seven components. Step 1, the decision context, is described first in Chapter 4. This is followed in Chapter 5 by a description of the evidence gathering process, which begins in Step 1 and continues throughout the planning process. Chapter 6 is devoted to plan formulation, one of the most important and least discussed tasks in any good planning process. Chapters 7 through 9 are the solution-assessment chapters. Chapter 7 describes how plans are evaluated or found worthy of consideration as potential solutions. Chapter 8 discusses the process of comparing the evaluated plans to highlight the differences among them that may make a difference to decision makers. Chapter 9 describes the magic of decision making. Public involvement, which is so essential to each of the five planning steps, is the topic of Chapter 10.

Telling your story is the focus of Chapter 11, which argues against the death by pagination planning reports of the past in favor of stories that people can understand and care about. Chapter 12 discusses uncertainty, which as you may already suspect is an important element of the planning process. Good planning must be honest about what it does and does not know. Chapter 13 introduces scenario planning, a variation on the planning process that has proven especially useful in situations where uncertainty is too great to say with confidence what the future may look like without any action from your plan.

I am an economist; I came to planning through economics, so Chapter 14 is about economics. This is an important chapter, no matter my background, because people always care about costs and costs are a little trickier than you might think. Sometimes you may need to speed up the planning process. Chapter 15 describes why and how you might plan fast. The book ends with the catch-all Chapter 16, which is full of things I just had to say even if you didn’t have to know them. The hope is you’ll find the tips are practical and useful too.

Planning is exciting, challenging, important, and fun. At least it can be, so if you are planning and it is not, maybe this book will help. Having a way to bring all that

theory and good knowledge you have acquired in school and life into practical focus to solve problems and realize opportunities is what this book is all about.

1.6 TAKE AWAYS

- Lesson 1: The world is uncertain, and the future is the most uncertain part of it.
- Lesson 2: Natural resource issues are among the sexiest issues on the planet.
- Lesson 3: Planning is one of humankind's most effective forms of collective action.
- Lesson 4: This book is about how to do planning.
- Lesson 5: There is no one way to plan, but there is a better way and a lot of worse ways.

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CHAPTER 2

A Team Sport



2.1 INTRODUCTION

Planning is done by people and they plan best in teams. There are two primary reasons why planning must be done by a team. The first and simplest reason is that two heads are better than one and many heads are better than two. No one person, no one discipline, no one group has all the answers. Many disciplines are needed for planning. No one has the background, experience, and knowledge necessary to plan alone. Planning is a social phenomenon that requires people to work together to solve problems.

The second and more enduring reason is that the world is extremely complex, and only a team structure can respond to social needs in this uncertain environment. Individuals do not know enough to develop good solutions to wicked problems on their own. Teams are needed. Large bureaucratic organizations are too rigid, too slow, and too costly to respond effectively in today's environment. Teams are a sensible and efficient compromise between the limitations of individuals and the inefficiency of large organizations. They make sense (Yoe and Orth 1996).

Good teams don't just happen. They must be built, and they must work well together. Oddly enough, team building and teamwork are responsibilities that often remain beneath the planning radar. Teams are important enough that before we

begin to talk about the principles, standards, processes, and practices of planning, we need to talk about teams. Who needs to plan? What does a team look like? What are the stages a team passes through as it matures? What processes does a team need, and what roles do team members fill? What does a team do? The answers to these questions are the subject matter of this chapter.

2.2 WHO NEEDS TO PLAN?

Individuals and organizations need to plan. The stewards of any public trust need to plan. Those charged with the care and keeping of public resources, whether natural resources or social resources like public health, public safety, homeland security, freedom of speech, and the like, would seem to have a social obligation to plan for their trusts. This would include government organizations at the federal, state, and local levels.

Nongovernmental organizations (NGOs) are often involved in planning. Sometimes they are the planning organization and other times they are major stakeholders in the planning efforts of government and private industries. Many private organizations with a social obligation or social conscience need to plan. Corporations that profit from natural resource use and exploitation have an obligation to stockholders and future generations to plan effectively for resource use, preservation, and reclamation. Trusts and foundations have assumed an active role in financing and planning for significant natural resources around the world.

Contractors, consultants, and architect and engineering firms all need to know how to plan. They are often paid to conduct the analytical aspects of the planning process and sometimes the deliberative ones as well.

Interested citizens need to know how to plan. Many local resource management efforts have flourished or floundered depending on the citizens' knowledge of and insistence on a planning process. Citizens who understand planning and insist on their role in the process are the best safeguard against bureaucratic processes replacing planning. Endangered and threatened species would plan if they could, so might abused waterways and other exploited resources. Planners include those who speak for those and that which cannot speak for itself.

2.3 PLANNING IS DONE IN TEAMS

Planning is a team sport. Social decision making should never be done in private or by individuals. Planning teams are more or less organized and more or less structured. They are collections of diverse people, essential roles, and necessary expertise; the best teams are all of these.

CHARACTERISTICS OF A GOOD TEAM

1. Team members are in close physical proximity and able to meet regularly.
2. The appropriate skills are represented on the team.
3. The appropriate levels of organizational authority are present within the team.

4. Team members are involved in the setting of objectives.
5. Objectives are understood by all members.
6. All individuals support the objectives.
7. Objectives are set and met within realistic time frames.
8. Roles are clearly defined and do not overlap.
9. Team members and their leaders know their assignments.
10. Roles are understood by all and are supported.
11. There is a strong, effective leadership with clearly defined responsibilities.
12. Members and leaders are accessible to each other.
13. Decisions are made by consensus.
14. Meetings are efficient and task-improvement oriented.
15. Emphasis is on problem solving versus blaming the individual responsible for the problem.
16. All members participate in discussions and meetings.
17. Minutes of meetings are promptly distributed.
18. Members listen well.
19. There is frequent feedback to individuals regarding performance.
20. All members are kept informed.
21. Deadlines and milestones are clearly established and agreed to by the team.
22. There is team identity or esprit de corps and pride.
23. There is tolerance for conflict with an emphasis upon resolution.
24. Conflict is openly discussed, often resulting in growth or learning.
25. Members enjoy each other.
26. Team members support each other.

Source: Yoe, C. and K. Orth. 1996. *Planning Manual*. IWR Report 96-R-21. Alexandria, VA: Institute for Water Resources.

Transdisciplinary teams are better than interdisciplinary teams are better than multidisciplinary teams are better than an uncoordinated group's efforts, which may be better than individual effort, which may be better than nothing. Your goal is to get your team as close to the beginning of that sentence as you can.

Doing nothing is easy. Ignoring things is one of the things we do best. Let's be clear about natural resource planning: it is not a one-person job. The natural systems are too complex, the social complexity is increasing, and no one person can do it well. Uncoordinated group efforts are, sadly, still relatively common. Many nominal planning efforts might well fall into this category.

Planning needs teams. A multidisciplinary team assembles a group of diverse experts who tackle complex problems together. The integration of their various disciplines is never a focus of the effort, and the work of such teams often has the flavor of a series of more or less well-connected analyses that we hope adds up to something meaningful to someone somewhere. Assembling the right disciplines is sometimes regarded as a hurdle to be leaped. Although this marks a substantial improvement over an uncoordinated group's effort, coordination of the efforts of the various disciplines falls well short of their integration.

Multidisciplinary teams are limited by the fact that disciplines have, over time, developed their own specific and occasionally peculiar ways of looking at the world. Many of us learn our fields in an “all other things equal” context. At times we have been trained to screen out those aspects of the world that conflict with our discipline’s way of looking at things. If we are to develop effective solutions to complex problems, we need a better-integrated view of the problems.

An interdisciplinary team begins, like the multidisciplinary team, with a rich diversity of expertise. It differs, however, in its intentional effort to integrate the various disciplines in a way that better recognizes the whole of the big picture for planning purposes. An interdisciplinary team crosses traditional boundaries between academic disciplines or schools of thought and weaves more holistic viewpoints of planning issues. Interdisciplinary solutions tend to be more responsive to social needs.

The experts in an interdisciplinary team come to understand the language and basic concepts of the other disciplines and their perspectives. This enables engineers to appreciate and consider the viewpoints of economists and environmentalists. This can lead to more economical and environment-friendly designs. Likewise, economists understand the importance of nonmonetized values reflected in other disciplines that may lead to cost-effectiveness and incremental cost analysis of quantifiable but nonmonetized plan effects.

A transdisciplinary team not only crosses traditional boundaries among disciplines, it erases those boundaries and integrates knowledge at the edges of disciplines. A transdisciplinary approach bridges many disciplines at once and develops a synergy among disciplines that creates new knowledge and ways of looking at problems and their solutions that transcend the abilities of traditionally bounded disciplines. As new needs and new disciplines emerge, disciplinary approaches that bridge and accommodate these changes are increasingly valuable. The most exciting disciplines now are those that integrate the traditional ones.

Litman (2011) points out that planners work at the intersection of many disciplines and need basic knowledge of a lot of subjects. Planning is an ideal field for people with diverse interests. Among the skills planners need, Litman includes the ability to:

- Accurately, critically, and objectively evaluate problems.
- Collect and analyze data.
- Apply general concepts to specific situations.
- Manage complex processes.

Transdisciplinary knowledge is greater than the sum of all the disciplines that comprise it. Local water issues are analogous to a multidisciplinary approach to planning. A systems approach represents the interdisciplinary step forward, and the watershed approach, when done well, is analogous to a transdisciplinary team approach to planning.