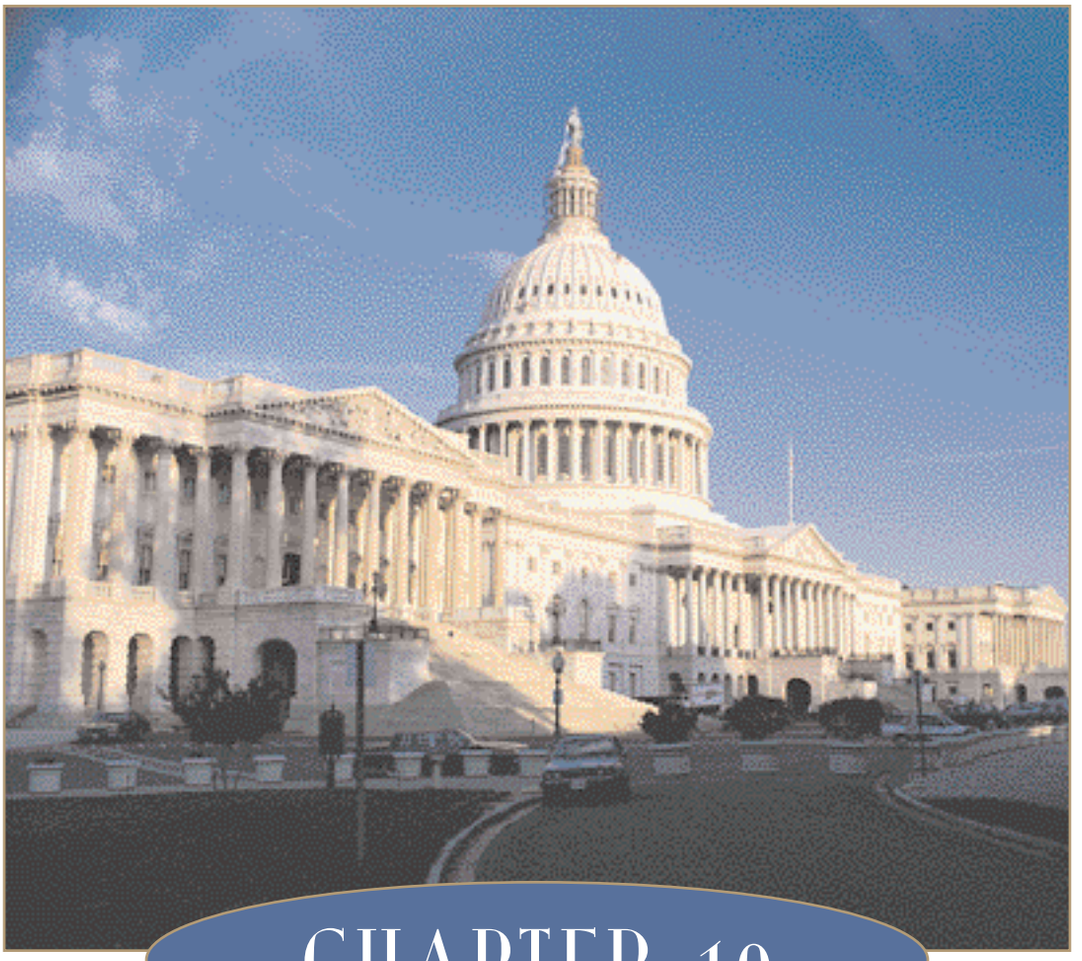
PART THREE

FOOD, LAND, AND BIOLOGICAL RESOURCES



CHAPTER 10

Environmental Policy, Law, and Planning

The significant problems we face cannot be solved at the same level of thinking we were at when we created them.

—Albert Einstein—

OBJECTIVES

After studying this chapter, you should be able to:

- understand the cycle by which policy is established.
- follow the path of a bill through the legislature.
- explore the differences between civil, criminal, and administrative law.
- judge the effectiveness of litigation in environmental issues.
- consider the reasons that international treaties have or have not been successful.
- appreciate the importance of wicked problems, resilience, and adaptive management in environmental planning.
- scrutinize collaborative, community-based planning methods.

ESSENTIAL STUDY PARTNER

The Essential Study Partner (ESP) CD-ROM that accompanies this textbook contains additional information on the following topics:

- environmental policy pathways: populations: societal issues: public action
- legislation for environmental education and careers: populations: societal issues: public action
- international treaties and conventions: populations: societal issues: public action
- environmental organizations: populations: societal issues: public action

Opposite: Food displayed in this floating market in Thailand shows some of the diversity and abundance that we derive from agriculture.

Above: The Capitol in Washington, DC, houses both the Senate and House of Representatives and is a major source of both environmental policy and law.

A Civil Action

Woburn, Massachusetts is a small, industrial city on the outskirts of Boston (fig. 10.1). Throughout the eighteenth and nineteenth centuries Woburn was a major leather manufacturing center with as many as 20 tanneries in operation at one time. Between 1853 and 1929, the Woburn Chemical Works was one of the largest industrial complexes in America. Centuries of careless toxic waste disposal badly contaminated the soil and groundwater under much of the city, and for many years residents complained that their well water tasted and looked terrible. In 1958, when the city drilled two new wells (designated G and H) to serve the growing population, the city engineer warned that the water was contaminated but the wells were used anyway for domestic consumption.

In 1971, young Jimmy Anderson, who lived in the part of Woburn served by these wells was diagnosed with leukemia. In talking with neighbors, Jimmy's mother, Anne, discovered that 11 other children within a few blocks of her house also had cancer. Depending on how you calculate the sample size, this was between 2.5 and 12 times the expected rate of childhood cancers. Was this merely a statistical anomaly or an ominous pattern? What might be causing these tragic illnesses? Could it be something in the water?

Although their suspicions were initially dismissed as emotional and unscientific, Woburn residents finally learned in 1979 that the water from wells G and H was indeed contaminated with a variety of metals and organic solvents including several suspected carcinogens. Coming just a year after a similar revelation about chemical contamination and links to childhood diseases at Love Canal in Niagara, NY, this discovery encouraged Anne Anderson and others to begin to ask who was responsible for polluting their neighborhood. In 1982, just a year after Jimmy died, Anne Anderson and seven other families whose children also had cancer sued the W. R. Grace Company and Beatrice Foods for damages caused by negligent disposal of toxic wastes on their properties near the wells. The families were represented by attorney Jan Schlichtmann of the public-interest law firm, Trial Lawyers for Public Justice of Boston.

Both Grace and Beatrice immediately filed motions for dismissal, claiming that even if they had dumped toxic wastes, the plaintiffs couldn't prove which of the many pollution sources in Woburn was cause of a specific disease in a particular person. These two corporations were chosen as targets out of all the possible industries in Woburn, their lawyers argued, simply because of their deep pockets. The judge ruled, however, that the case had sufficient merit to proceed to a jury trial. After four years of interrogatories, deposition of hundreds of witnesses, thousands of pages of documents, extensive examination of medical histories and physical conditions of each of the plaintiff families, and investigation of the industrial sites, the case finally went to trial in 1986. In the discovery process, the plaintiffs conducted their own on-site investigation that revealed drums of toxic chemicals buried on the Grace property. Conviction on charges that the company had lied to the EPA about when and where wastes had been disposed didn't help the defense in the civil trial.

After a five-month trial and seven days of jury deliberation, the case against Beatrice was dismissed, but the jury found that Grace had negligently contaminated the Woburn wells. The jury could not decide, however, when contaminants from the Grace property might have reached the wells. Was it before or after the children developed cancer? This uncertainty led the judge to dismiss the verdict and order a new trial. Rather than go through the process all over again, both sides agreed to settle for $8 million. Grace also agreed to participate in a $68 million cleanup of the wells, the most expensive Superfund project in Massachusetts at the time.

Because the case was settled out of court, it doesn't create a legal precedent, but it was one of the first times that plaintiffs succeeded in gaining compensation in an environmental injury lawsuit. As a story of a few local families challenging corporate giants, it gained national attention, and served as a warning to corporations that they can be held liable for personal injuries from negligent disposal of toxic wastes. A 1995 novel by Jonathan Harr about this case, titled *A Civil Action*, was turned into a movie by the same name starring John Travolta and Robert Duvall. Check out the novel or movie if you'd like to see more about how the drama unfolded.

This case illustrates both changing attitudes in the United States towards waste disposal and environmental liability as well as use of the courts to redress personal environmental injuries. In this chapter, we'll examine both how environmental policy is formed as well as how the legislative, legal, and administrative systems work to accomplish policy goals.

FIGURE 10.1 Woburn, a small industrial city within the Boston metropolitan area, was the site of an important environmental law case.

ENVIRONMENTAL POLICY

The term "policy" is used in many different ways to indicate both formal and informal decisions or intentions at a personal, community, national, or international level. You might have an informal policy never to accept telemarketing calls; your church may have an open-door policy for visitors; and the United States has a policy not to negotiate with terrorists. At the same time, the Clean Air Act is a formal statement of our national policy on acceptable air quality, while the Convention on Global Climate Change represents the official intentions of many nations to curb greenhouse gases. Interestingly, policy can describe both an actual document as well as a contractual agreement, such as when you buy insurance. At its core, then, **policy** is a plan or statement of intentions—either written or stated—about a course of action or inaction intended to accomplish some end. Some political scientists limit the term public policy to the principles, laws, executive orders, codes, or goals established by some government body or institution. For the purposes of this chapter, **environmental policy** will be taken as those official rules and regulations concerning the environment that are adopted, implemented, and enforced by some governmental agency as well as general public opinion about environmental issues (fig. 10.2).

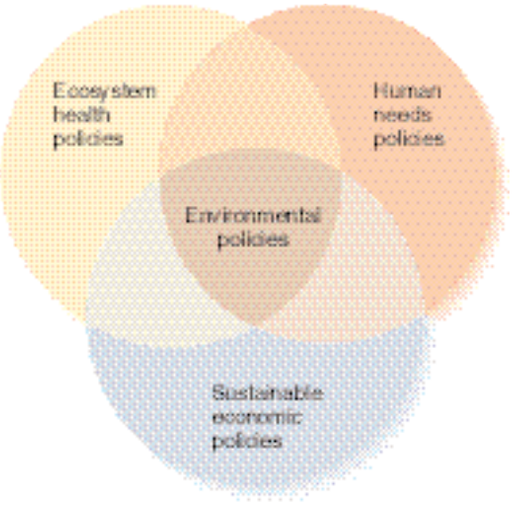


FIGURE 10.2 The best environmental policies incorporate economic, ecological, and social/cultural considerations.
Source: Modified from Ray Grizzle, *Bioscience*, vol. 44(4), April 1994.

Political Decision Making

The policies we establish depend to a great extent on the system within which they operate. For many of us, the ideal political system is one that is open, honest, transparent, reaches the best possible decisions to maximize benefits to everyone. In a pluralistic, democratic society, we aim to give everyone an equal voice in policy making. Ideally, many separate interests put forward their solutions to public problems that are discussed, debated, and evaluated fairly and equally. Facts and access are open to everyone. Policy choices are made democratically but compassionately; implementation is reasonable, fair, and productive. Unfortunately, this isn't always the way our system works. What are some alternate explanations of how we create policy?

Politics as Power

According to some observers, politics is really the struggle among often unequal, competing interest groups as they strive to shape public policy to suit their own agendas. The political system, in this view, manages group conflict by (1) establishing rules to ensure civil competition, (2) encouraging compromises and balancing interests to the extent possible, (3) codifying compromises as public policy, and (4) enforcing laws and rules based on that policy. Where this form of power politics is operational, it often results in a tyranny of a powerful elite over the impotent masses. Those elites manipulate public opinion and give up only as much power and wealth as necessary to maintain overall control.

However, while self-interest and power politics clearly are important forces in American public life, they can't account for all of the civil rights and environmental movements, the war on poverty, and public interest that characterized much of the 1960s and 1970s. The force of ideals, values, and altruism sometimes carry the day even in our winner-take-all system. We seem to go through periods of public spirit, optimism, and openness to change every few decades that give our public life a sense of generosity and good will.

Rational Choice

Another model for public decision making is **rational choice** and science-based management. In this utilitarian approach, no policy should have greater total costs than benefits. In choosing between policy alternatives, we should always prefer those with the greatest cumulative welfare and the least negative impacts. Professional administrators would weigh various options and make an objective, methodical decision that would bring maximum social gain. As Chapters 2 and 8 illustrate, there are many arguments against utilitarian, cost-benefit approaches that are generally applicable to public decision making.

- Many conflicting values and needs cannot be compared because they aren't comparable or we don't have perfect information.
- There are few generally agreed-upon broad societal goals but rather benefits to specific groups and individuals, many of which are in conflict.
- Policymakers generally are not motivated to make decisions on the basis of societal goals, but rather to maximize their own rewards: power, status, money, or reelection.
- Large investments in existing programs and policies create "path dependence" and "sunken costs" that prevent policymakers from considering good alternatives foreclosed by previous decisions.
- Uncertainty about consequences of various policy options compels decision makers to stick as closely as possible to previous policies to reduce the likelihood of adverse, calamitous, unanticipated consequences.

- Policymakers, even if well-meaning, don't have sufficient intelligence or adequate data or models to calculate accurate costs and benefits when large numbers of diverse political, social, economic, and cultural values are at stake.
- The segmented nature of policy making in large bureaucracies makes it difficult to coordinate decision making.

The Policy Cycle

How do policy issues and options make their way onto the stage of public debate? In this section, we will look at the **policy cycle** by which problems are identified and acted upon in the public arena (fig. 10.3). The first stage in this process is problem identification. Sometimes the government identifies issues for groups that have no voice or don't recognize problems themselves. In other cases, the public identifies a problem such as loss of biodiversity or health effects exposure to toxic waste and demands redress by the government. In either case, proponents describe the issue—either privately or publicly—and characterize the risks and benefits of their preferred course of action. Seizing the initiative in issue identification often allows leaders to define terms, set the agenda, organize stakeholders, choose tactics, aggregate related issues, and legitimate (or de-legitimate) issues and actors. It can be a great advantage to define the terms or choose the location of a debate. Next, stakeholders develop proposals for preferred policy options, often in the form of legislative proposals or administrative rules. Proponents build support for their position through media campaigns, public education, and personal lobbying of decision makers. By following the legislative or administrative process through its many steps, interest groups ensure that their proposals finally get enacted into law or established as a rule or regulation.

The next step is implementation. Ideally, government agencies will faithfully carry out policy directives as they organize bureaucracies, provide services, and enforce rules and regulations, but often it takes continued monitoring to make sure the system works as it should. Evaluating the results of policy decisions is as important as establishing them in the first place. Measuring impacts on target and nontarget populations shows us whether the intended goals, principles, and course of action are being attained. Finally, suggested changes or adjustments are considered that will make the policy fairer or more effective.

There generally are two different routes by which this cycle is carried out. Special economic interest groups such as industry associations, labor unions, or wealthy and powerful individuals don't need (or often want) much public attention or support for their policy initiatives. They generally carry out the steps of issue identification, agenda setting, and proposal development privately because they can influence legislative or administrative processes directly through their contacts with decision makers. Public interest groups, on the other hand, often lack direct access to corridors of power and need to rally broad general support to legitimate their proposals. An important method for getting their interests on the table is to attract media attention. Organizing a dramatic protest or media event can generate a lot of free publicity. Announcing some

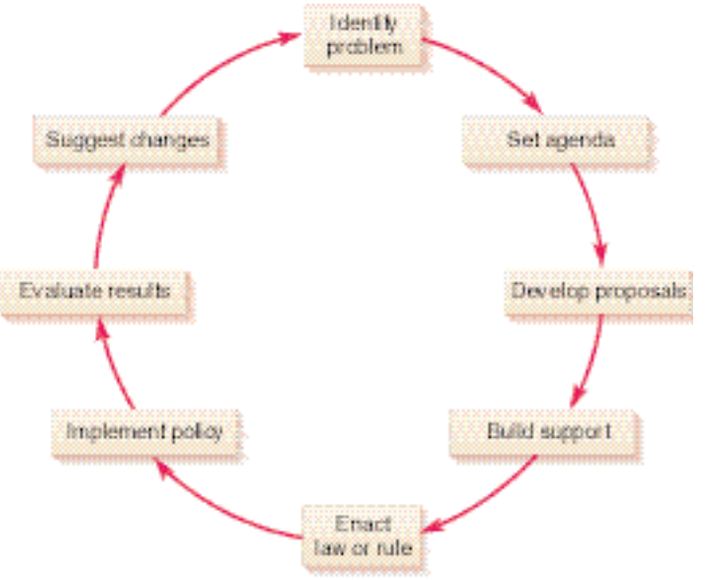


FIGURE 10.3 The policy cycle.

dire threat or sensational claim is a good way to gain attention. The problem is that it takes ever increasing levels of hysteria and hyperbole to get yourself heard in the flood of shocking news with which we are bombarded every day. Ironically, many groups that bemoan the overload of rhetorical overstatement that engulfs us, contribute to it in order to be heard above the din.

NEP and EIS

The National Environmental Policy Act (NEPA) forms the cornerstone of both U.S. environmental policy and environmental law. Passed in 1969 but signed by President Nixon in 1970, NEPA does three important things: (1) It authorizes the Council on Environmental Quality (CEQ), the oversight board for general environmental conditions; (2) It directs federal agencies to take environmental consequences into account in decision making; and (3) It requires an Environmental Impact Statement (EIS) be prepared for every major federal project having a significant impact on the quality of the human environment. When NEPA was being debated, there were suggestions that it should be a constitutional amendment guaranteeing the right of a clean environment to everyone. Difficulties in defining what "clean" means, along with worries about how we could achieve this ambitious goal, limited NEPA to a statute with more limited, but still important, powers than a constitutional amendment. What do you think? Does everyone have an inherent right to a clean environment? How would you define clean?

The EIS process has proven to be one of the most powerful tools in the environmental arsenal. It requires more open and environmentally sensitive planning in both the agencies themselves and in private corporations seeking to do business with the government. An EIS can bring to light adverse aspects of a project that might otherwise remain hidden. It can provide valuable information about a proposal to opponents who can't afford to do their own research.

FIGURE 10.4 Every major federal project in the United States must be preceded by an Environmental Impact Statement. This is the Glen Canyon Dam on the Colorado River in Arizona.

An EIS doesn't forbid environmentally destructive activities if they comply otherwise with relevant laws, but it demands that we admit what we're really doing. Once embarrassing information is revealed, however, few agencies will bulldoze ahead oblivious to public opinion.

There are several threshold considerations that determine whether a project requires an EIS. The activity must be federal and it must be major, with a significant impact on the human environment (fig. 10.4). Evaluations are always somewhat subjective as to whether specific activities meet these characteristics. Each case is unique and depends on context, geography, the balance of beneficial versus harmful effects, and whether any areas of cultural, scientific, or historical importance might be affected. To do a complete EIS for a project is usually time-consuming and costly. The final document is often hundreds of pages long and generally takes six to nine months. Sometimes just requesting an EIS is enough to sideline a questionable project. In other cases, it gives adversaries time to rally public opposition and information with which to criticize what's being proposed. If agencies don't agree to prepare an EIS voluntarily, environmentalists can petition the courts to force them to do so.

Every EIS must contain the following elements: (1) purpose and need for the project, (2) alternatives to the proposed action (including taking no action), (3) a statement of positive and negative environmental impacts of the proposed activities. In addition, an EIS should make clear the relationship between short-term resources and long-term productivity, as well as any irreversible commitment of resources resulting from project implementation.

ENVIRONMENTAL LAW

Laws are rules set by authority, society or custom. Church laws, social morés, administrative regulations, and a variety of other codes of behavior can be considered laws if they are backed by some enforcement power. Government laws are established by federal, state, or local legislative bodies or administrative agencies. **Environmental law** constitutes a special body of official rules, decisions, and actions concerning environmental quality, natural resources, and ecological sustainability. Each of the three branches of government play a role in establishing the rules of law. **Statute law** consists of formal documents or decrees enacted by the legislative branch of government declaring, commanding, or prohibiting something. It represents the formal will of the legislature. **Case law** is derived from court decisions in both civil and criminal cases. **Administrative law** rises from executive orders, administrative rules and regulations, and enforcement decisions in which statutes passed by the legislature are interpreted in specific applications and individual cases. Because every country has different legislative and legal processes, this chapter will focus primarily on the U.S. system in the interest of simplicity and space.

A Brief Environmental History

Before looking at how each of these branches of government function it might be useful to review how the underlying attitudes towards our environment and the policies that underlie our environmental laws have changed over the past century. As the Woburn story shows, for most of its history, U.S. environmental policy has had a laissez-faire or hands-off attitude toward business and private property. Pollution and environmental degradation were regarded as the unfortunate but necessary cost of doing business. If you didn't like the smell of a tannery or the sight of a waste dump, you were free to go somewhere else. While there were some early laws forbidding gross interference with another person's property or rights—the Rivers and Harbors Act of 1899, for example, made it illegal to dump so much refuse in waterways that navigation was blocked—in general, everyone was free to do whatever they wanted on their own property. People were either unaware of, or didn't pay much attention to, the fact that pollutants can move through the air, soil, and water to endanger people distant from the source.

The emergence of the modern environmental movement in the 1960s and 1970s marked a dramatic turning point in our understanding of the dangerous consequences of pollution and our demands to be protected from it. Rachel Carson's *Silent Spring* (1962) and Barry Commoner's *Closing Circle* (1971) alerted the public to the ecological and health risks of pesticides, hazardous wastes, and toxic industrial effluents. Public activism in the civil rights and antiwar movements was carried over to environmental protests and demands for environmental protection. Emergence of new media—especially television—provided access to environmental news and made events in faraway places seem immediate and important.

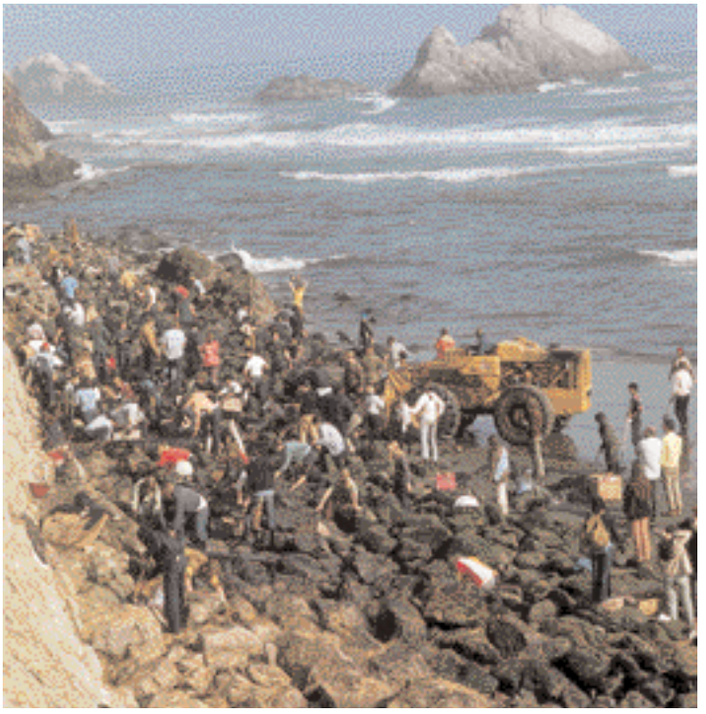


FIGURE 10.5 Beach cleanup efforts after the Santa Barbara oil spill in 1969 made excellent media material and had an important role in U.S. environmental policy.

The 1969 blowout of an oil well in the Santa Barbara Channel just off the coast of southern California is a good example of how the convergence of actors, events, timing, and media attention can shape public opinion and influence the policy cycle. For many weeks, black, gooey crude oil washed up onto beautiful southern California beaches. The oil spill made a perfect story for TV. The continuing saga was ideal for nightly updates. The setting guaranteed good photos and was readily recognized by the viewing public as an important place (fig. 10.5). National news networks had just developed the capacity for live satellite feeds and were hungry to use their new technology. Los Angeles was one of few locations with reliable uplinks and Santa Barbara was close enough for a film crew to go out every day to get some good footage and be back in the studio in time for the five o'clock news.

Because the story was ongoing, it fit well in the 30-second spots characteristic of TV news. The audience was familiar with both the issue and the images that described it. Reporters didn't have to spend precious seconds explaining what was happening, but could just give a sporting-event-like update on which side was winning today. A policy debate in Congress might be more important, but is too complex to explain in a few seconds and doesn't provide exciting visuals. The wealthy residents of Santa Barbara were media-savvy, and had the influence and contacts to publicize the oil spill. While some of the cleanup efforts were not very effective, they made great visual footage. Attractive young people, smudged with oil, trying vainly to sweep gooey crud off a beautiful beach made ideal TV footage. Although the Santa Barbara oil spill wasn't nearly as big as others around the world, it played an important role in mobilizing public opinion and was an major factor in passage of the 1972 Clean Water Act.

As a result of awakened public concern about environmental issues, more than 27 major federal laws for environmental protection and hundreds of administrative regulations were established in the United States in the environmental decade of the 1970s. The statutes, case law, rules, precedents, and agencies resulting from that period created the foundation on which much of our current environmental protection rests. In the initial phase of this environmental revolution, the main focus was on direct regulation and litigation to force malefactors to obey the law. In recent years, attention has shifted from end-of-the-pipe command and control to pollution prevention and collaborative methods that can provide win/win solutions for all stakeholders. We'll look at some of those alternative dispute resolution approaches later in this chapter. But next, let's look more closely at how environmental law is established and administered.

Statutory Law: The Legislative Branch

Establishing laws at either the state or federal level is one of the most important ways of protecting our environment. Many environmental groups spend a good deal of their time and resources trying to influence the legislative process. In this section we'll look at how that system works.

Federal laws (statutes) are enacted by Congress and must be signed by the president. They originate as legislative proposals called bills, which are usually drafted by the congressional staff, often in consultation with representatives of various interest groups. Thousands of bills are introduced every year in Congress. Some are very narrow, providing funds to build a specific section of road or to help a particular person, for instance. Others are extremely broad, perhaps overhauling the social security system or changing the entire tax code. Similarly, environmental legislation might deal with a very specific local problem or a national or international issue. Often a number of competing bills on a single issue may be introduced as proponents from different sides attempt to incorporate their views into law. A bill may have a single sponsor if it is the pet project of a particular legislator, or it may have 100 or more coauthors if it is an issue of national importance.

A Convoluted Path

After introduction, each bill is referred to a committee or subcommittee with jurisdiction over the issue for hearings and debate (fig. 10.6). Most hearings take place in Washington, but if the bill is controversial or legislators want to attract publicity for themselves or the issue, they may conduct field hearings closer to the site of the controversy. The public often has an opportunity to give testimony at field hearings (fig. 10.7). Although it's not likely that you will change the opinions of many legislators no matter how fervent or cogent your testimony, these events can be a good place to gain attention and educate the public about a topic. Hearings and debates also build a record of legislative intent that can be valuable

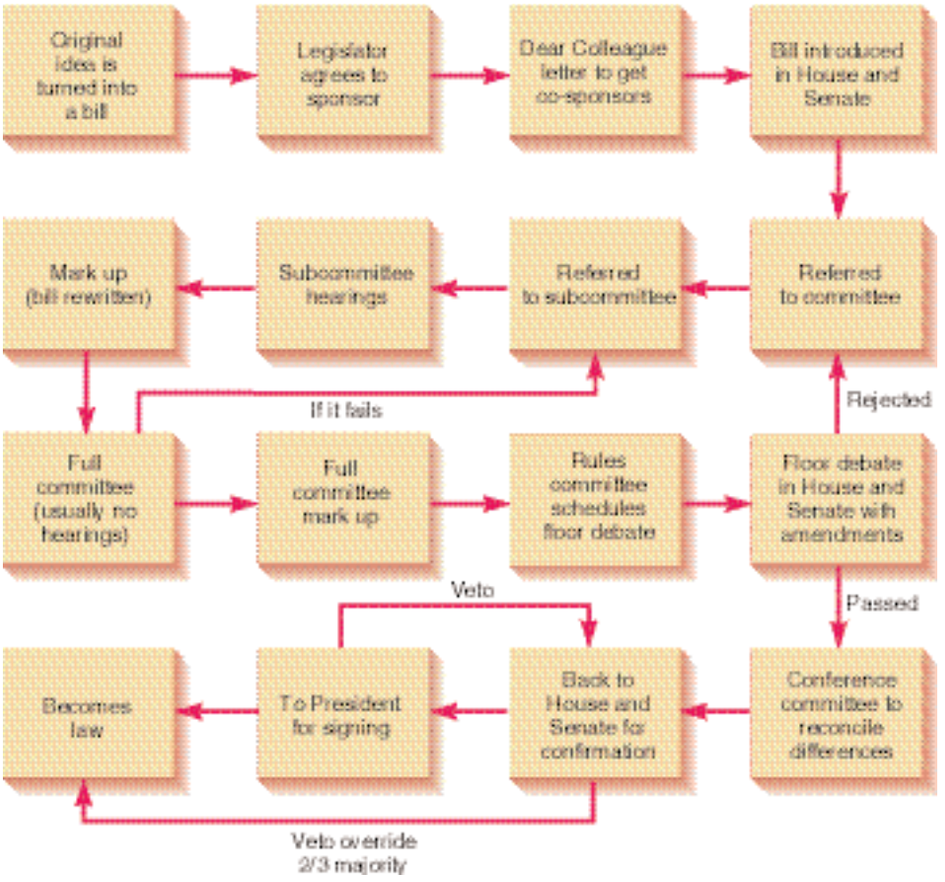


FIGURE 10.6 The path of a bill from inception to actual law.

FIGURE 10.7 Citizens line up to testify at a legislative hearing. By getting involved in the legislative process, you can be informed and have an impact on governmental policy.

in later interpretation and implementation of laws by courts and administrative agencies.

If a bill has sufficient support within the subcommittee, its language will be "marked up" or revised and modified to be more widely acceptable and to improve its chances of passage. At this stage several competing bills might be combined into a single compromise version. If the compromise bill garners sufficient support, it is forwarded to the full committee for more hearings, debate, and a vote. If it fails in the full committee, the bill is sent back to the subcommittee for more work and further compromise. A bill that succeeds in the full committee is reported to the full House or Senate for a floor debate. Often opponents of a bill will attempt to amend it during each of these stages to lessen its impact or to make it so unpalatable that even the original authors can no longer support it. Some amendments add completely unrelated material or even reverse the intent of a bill. As bills move through this convoluted pathway, interested parties can follow their progress in the *Congressional Quarterly Weekly,* a publication both in print and online that keeps track of proposed legislation. Many environmental groups also maintain websites with up-to-date information on events in Congress.

By the time an issue has passed through both the House and Senate, the versions approved by the two bodies are likely to be different. They go then to conference committee to iron out any differences between them. After going back to the House and Senate for confirmation, the final bill goes to the president, who may either sign it into law or veto it. If the president vetoes the bill, it may still become law if two-thirds of the House and Senate vote to override the veto. If the president takes no action within 10 days of receiving a bill from Congress, the bill becomes law without his signature.

One exception to this procedure is that if Congress adjourns before the 10-day period elapses, the bill does not become law. The president, by doing nothing, is said to have exercised a "pocket veto."

The Thomas website, maintained by Congress, also has current information about the progress of legislation. You can find out how your Senator and Representative voted on critical environmental issues by consulting The League of Conservation Voters, which ranks each member of Congress on their voting record. The Defenders of Wildlife maintains a daily e-mail environmental news service called Greenwire that has up-to-date information about what's happening in Washington. Table 10.1 lists some of the most important recent federal environmental legislation.

Legislative Riders

There are two types of legislation: authorizing bills become law, while appropriation bills provide funds for federal agencies and programs. Appropriation bills can have language attached expressing the intent of Congress, but, in theory, at least, are not supposed to make policy, merely fund existing plans and projects. Legislators who can't muster enough votes to pass pet projects through regular channels often will try to add authorizing amendments called **riders** into completely unrelated funding bills. Even if they oppose the riders, other members of Congress have a difficult time voting against an appropriation package for disaster relief or to fund programs that benefit their districts. Often this happens in conference committee because when the conference report goes back to the House and Senate, the vote is either to accept or reject with no opportunity to debate or amend further.

Starting with the 104th Congress, antienvironmental forces began using this tactic to roll back environmental protections and gain access to natural resources. Environmental groups were outraged, for instance, when riders were attached to 1996 supplemental spending bills that put a moratorium on listing additional species under the Endangered Species Act and exempted "salvage" logging on public lands from environmental laws. In the 105th Congress, numerous antienvironmental riders were attached to appropriation bills. The Omnibus spending bill in fiscal year 1999, for example, was festooned with 41 special-interest amendments to allow grazing on public land without environmental review, impede parkland acquisition in Alaska, increase timber harvest on several national forests, build new roads through some wilderness areas and wildlife refuges, eliminate protection for certain coastal

TABLE 10.1 Major U.S. Environmental Laws

LEGISLATION	PROVISIONS
National Environmental Policy Act of 1969	Declared national environmental policy, required environmental impact statements, created Council on Environmental Quality.
Clean Air Act of 1970	Established national primary and secondary air quality standards. Required states to develop implementation plans. Major amendments in 1977 and 1990.
Clean Water Act of 1972	Set national water quality goals and created pollutant discharge permits. Major amendments in 1977 and 1996.
Federal Pesticides Control Act of 1972	Required registration of all pesticides in U.S. commerce. Major modifications in 1996.
Marine Protection Act of 1972	Regulated dumping of waste into oceans and coastal waters.
Coastal Zone Management Act of 1972	Provided funds for state planning and management of coastal areas.
Endangered Species Act of 1973	Protects threatened and endangered species, directs FWS to prepare recovery plans.
Safe Drinking Water Act of 1974	Set standards for safety of public drinking water supplies and to safeguard groundwater. Major changes made in 1986 and 1996.
Toxic Substances Control Act of 1976	Authorized EPA to ban or regulate chemicals deemed a risk to health or the environment.
Federal Land Policy and Management Act of 1976	Charged the BLM with long-term management of public lands. Ended homesteading and most sales of public lands.
Resource Conservation and Recovery Act of 1976	Regulated hazardous waste storage, treatment, transportation, and disposal. Major amendments in 1984.
National Forest Management Act of 1976	Gave statutory permanence to national forests. Directed USFS to manage forests for "multiple use."
Surface Mining Control and Reclamation Act of 1977	Limited strip mining on farmland and steep slopes. Required restoration of land to original contours.
Alaska National Interest Lands Act of 1980	Protected 40 million ha (100 million acres) of parks, wilderness, and wildlife refuges.
Comprehensive Environmental Response, Compensation and Liability Act of 1980	Created $1.6 billion "Superfund" for emergency response, spill prevention, and site remediation for toxic wastes. Established liability for cleanup costs.
Superfund Amendments and Reauthorization Act of 1994	Increased Superfund to $8.5 billion. Shares responsibility for cleanup among potentially responsible parties. Emphasizes remediation and public "right to know."

Source: N. Vig and M. Kraft, *Environmental Policy in the 1990s*, 3rd Congressional Quarterly Press.

barrier islands, and prevent grizzly bear reintroduction in Idaho and Montana, among other things. In another case, riders to delay mining reforms and forbid designation of critical habitat under the Endangered Species Act were attached to relief bills to aid war victims in Kosovo and Hurricane Mitch victims in Honduras. Congressional leaders pledged to end this practice, but little has been done so far to stop it.

Lobbying

Groups or individuals with an interest in pending legislation can often cause a great deal of influence by **lobbying,** or using personal contacts, public pressure, and political action to persuade legislators to vote or act in their favor. The term derives from the habit of partisans and professional lobbyists to lurk in the hallways and lobbies of Congress hoping to snare a passing legislator to urge them to vote in a specific way. We also use the same term to describe efforts to influence administrative agencies.

Most major environmental organizations maintain offices in Washington from which they monitor legislative and administrative programs and policies. Hundreds of professional environmental lobbyists and volunteer activists attend hearings, meet with legislators and agency personnel, draft proposed legislation and administrative rules, and attempt in a variety of ways to shape the national environmental agenda. They join thousands of other amateur and professional lobbyists representing industry and business organizations, workers, property owners, religious groups, ethnic associations, and just about every other kind of interest group that you can imagine. Walking the halls of Congress or those of the House or Senate Office Buildings, you see an amazing mixture of people attempting to be heard. It's fascinating to be part of this process.

In a survey of professional lobbyists, a majority agreed that personal contacts were the most effective way to influence decision makers. Undoubtedly the best way to make contact is through personal friends of a legislator or someone to whom they owe political allegiance. Having a famous movie star, a person of great power or wealth, or some other celebrity represent your group also can help open doors for your ideas. Your own senator or representative is more likely to be interested in your views than someone with whom you have no connection. They place a high priority on responding to their own constituents who can vote them in (or out) of office. But even if you aren't rich or illustrious or politically connected, you can often get a fair hearing from legislative staff—if not their bosses—if you have a persuasive case concerning an important topic.

What can those of us do to have an impact on legislation who can't afford to go to Washington to be directly involved? Getting involved in local election campaigns can greatly increase your access to legislators. Writing letters or making telephone calls also are highly effective ways to get your message across. You'd be surprised at how few letters or calls legislators receive even on important national issues. Your voice can have an important impact. How to write an effective letter is described further in chapter 25. All legislators now have e-mail addresses, although it isn't clear how much weight this form of communication carries.

FIGURE 10.8 Protests, marches, and public demonstrations can be an effective way to get your message out and to influence legislators.

Getting media attention can sway the opinions of decision makers. Organizing protests, marches, demonstrations, or other kinds of public events can call attention to your issue (fig. 10.8). Public education campaigns, press conferences, TV ads, and a host of other activities can be helpful. Tax-exempt (503c) organizations can't lobby directly or engage in politics, but there is a murky line between educational ads and outright campaigning and lobbying. Joining together with other like-minded groups can greatly increase your clout and ability to get things done. It's hard for a single individual or even a small group to have much impact, but if you can organize a mass movement, you may be very effective.

Case Law: The Judicial Branch

Over the past 30 years, appeals to the judicial system have often been the most effective ways for seeking redress for environmental damage and forcing changes in how things are done. Activist judges and sympathetic juries in both federal and state court systems have been willing to take a stand where legislatures have been too timid or conservative to do so. Many groups spend a great deal of their time and energy bringing lawsuits that will shape environmental policy. The Environmental Defense Fund, for example, operates primarily in this arena. In the early days of the organization, their motto was, "Sue the bastards, that will get their attention." Even if you're not interested in environmental issues, it's worthwhile knowing something about how this system works. You may find yourself in court someday.

The judicial branch of government establishes environmental law by ruling on the constitutionality of statutes and interpreting their meaning. We describe the body of legal opinions built up by many court cases as case law. Often legislation is written in vague and general terms so as to make it widely enough accepted to gain passage. Congress, especially in the environmental area, often leaves it to the courts to "fill in the gaps." As one senator said when Congress was about to pass the Superfund legislation, "All we know is that the

American people want these hazardous waste sites cleaned up . . . Let the courts worry about the details." When trying to interpret a law, the courts depend on the legislative record from hearings and debates to determine congressional intent. What was a particular statute meant to do by those who wrote and passed it?

The Court System

The United States is divided into 96 federal court districts, each of which has at least one trial court. Over these district courts are the circuit court of appeals, which hears disputes arising from questions about procedural issues and interpretations of the law in district courts. There are 12 geographic regions for the appeals courts. The federal courts have jurisdiction over federal criminal prosecutions, claims against the federal government, claims arising under federal statutes or treaties, and cases in which defendants or plaintiffs come from two or more states. The residence of the defendant of location of the property in dispute usually determines the venue, or the court in which each case is heard. Each state has its own courts that generally parallel the federal system. These courts have jurisdiction over cases arising from state laws. The U.S. Supreme Court is the court of last resort for appeals for both federal and state court systems.

A trial court judge presides over trials, rules on motions made by attorneys, and decides questions of law, such as what evidence is admissible, and what law applies to the case (fig. 10.9). The judge controls the pace of the proceedings and maintains decorum in the court room. Although Thomas Jefferson said, "Ours is a government of laws, not men," in reality, the judge has tremendous power over the outcome of a trial. Certain courts earn a reputation of being pro- or antienvironmental. Litigants always try to know something about the judge's ideology before bringing a case to trial.

The first judge to hear a case arising from a particular statute or situation has the greatest latitude to interpret the law and set a **precedent** to be used as an example in subsequent trials. These decisions are binding, however, only on those courts on a lower level and in the same system. Precedents from the California courts, for instance, are not binding in Arizona courts. Furthermore, if a judge *distinguishes* a case—determines it is different from other cases—she or he is not obliged to adhere to prior precedents. Or a judge can always simply overturn a clearly applicable precedent as a matter of "correcting the law" where technology or changing community values has made prior decisions outdated.

Legal Thresholds

Before a trial can start, the litigants must satisfy certain threshold requirements. The first of these is **standing,** or whether the participants have a right to stand before the bar and be heard. The main criteria for standing is a valid interest in the case. Plaintiffs must show that they are materially affected by the situation they petition the court to redress. This is an important point in environmental cases. Groups or individuals often want to sue a person or corporation for degrading the environment. But unless they can show that they personally suffer from the degradation, courts are likely to deny standing.

FIGURE 10.9 A trial court judge presides over trials, rules on motions, and interprets the law.

In a landmark 1969 case, for example, the Sierra Club challenged a decision of the Forest Service and the Department of the Interior to lease public land in California to Walt Disney Enterprises for a ski resort. The land in question was a beautiful valley that cut into the southern boundary of Sequoia National Park (see fig. 2.5). Building a road into the valley would have necessitated cutting down a grove of giant redwood trees within the park. The Sierra Club argued that it should be granted standing in the case to represent the trees, animals, rocks, and mountains that couldn't defend their own interests in court. After all, the club, pointed out, corporations—such as Disney Enterprises—are treated as persons and represented by attorneys in the courts. Why not grant trees the same rights? The case went all the way to the Supreme Court, which ruled that the Sierra Club failed to show that it or any of its members would be materially affected by the development.

In addition to standing, plaintiffs must show that their case represents a "live" legal dispute that is likely to result in a final and meaningful judgment, and that there is a present controversy for which a decision is needed. In other words, you can't bring a suit over a hypothetical situation or one that is no longer cogent. For example, suppose you want to stop a development project that would destroy endangered species habitat. If the defendant can show that the species couldn't inhabit the habitat (if it were already extinct, for instance), the case is moot (of no practical importance) and the courts will refuse to hear it.

Criminal Law

Criminal law derives from those federal and state statutes that prohibit wrongs against the state or society, such as arson, rape, murder, and robbery. Serious crimes, like murder or rape, that are punishable by long-term incarceration or heavy fines are called felonies. Lesser crimes, such as shoplifting or vandalism, that result in smaller fines or shorter sentences in a county or city jail are labeled misdemeanors. Definitions vary from state to state. What may be a felony crime in one state may be only a misdemeanor in another.

A criminal case is always initiated by a government prosecutor. Guilt or innocence of the defendant is determined by a jury of peers, but the sentence is imposed, often in consultation with the jury, by the judge. The judge is responsible for keeping order in the hearings and for determining points of law. The jury acts as a fact-finding body that weighs the truth and reliability of the witnesses and evidence. Figure 10.10 shows the course of events in a lawsuit.

Violation of many environmental statutes constitutes criminal offenses. In 1975, the U.S. Supreme Court ruled that corporate officers can be held criminally liable for violations of environmental laws if they were grossly negligent, or the illegal actions can be considered willful and knowing violations. In 1982, the EPA created an Office for Criminal Investigation. Recently as many as 100 criminal prosecutions per year have been brought to court for environmental crimes. In one of the toughest criminal sentences imposed so far, the president of a Colorado company was sentenced, in 1999, to 14 years in prison for knowingly dumping chlorinated solvents that contaminated the water table. The company itself was fined $950,000 and put on probation for ten years. Also in 1999, two Connecticut men were convicted of three counts of abandoning 40 drums of hazardous waste in a parking lot in New Haven. The fact that they stripped off or painted over the identifying labels was taken as willful intent to commit a crime. They face up to seven years in prison and a $250,000 fine for each count.

Civil Law

Civil law is defined as a body of laws regulating relations between individuals or between individuals and corporations. Issues such as property rights, and personal dignity and freedom are protected by civil law. In some cases, legislative statutes, such as the Civil Rights Act, establish specific aspects of civil law. In other cases, where no particular statute exists, custom and a body of previous court decisions, collectively called **common law,** establish precedents that constitute a working definition of individual rights and responsibilities. The Woburn case that opened this chapter, is an example of **tort law** (tort derives from the Middle English word for injury) that seeks compensation for damages. This kind of civil action is usually initiated by the attorney representing the injured party (the plaintiff). The defendant in a civil case has a right to be tried by a jury, but in highly technical issues, this right often is waived and the case is heard only by the judge. Being found guilty of a civil offense can result in financial penalties but not jail time.

In contrast to a criminal case where the burden of proof lies with the prosecution, and defendants are considered innocent until proven guilty, civil cases can be decided on a "preponderance of evidence." This makes civil cases considerably easier to win than criminal cases where the evidence is ambiguous. A number of mitigating factors also are taken into account in determining guilt and assigning penalties in civil cases. Culpability is based on whether the defendant could reasonably have anticipated and avoided the offense. A "good faith effort" to comply or solve the problem can be a factor. The compliance history is important. Is this a first offense or a habitual repeater? Finally, is there evidence of economic benefit to the perpetrator? That is, did the violator gain personally from the action? If so, it is more likely that willful intent was involved.

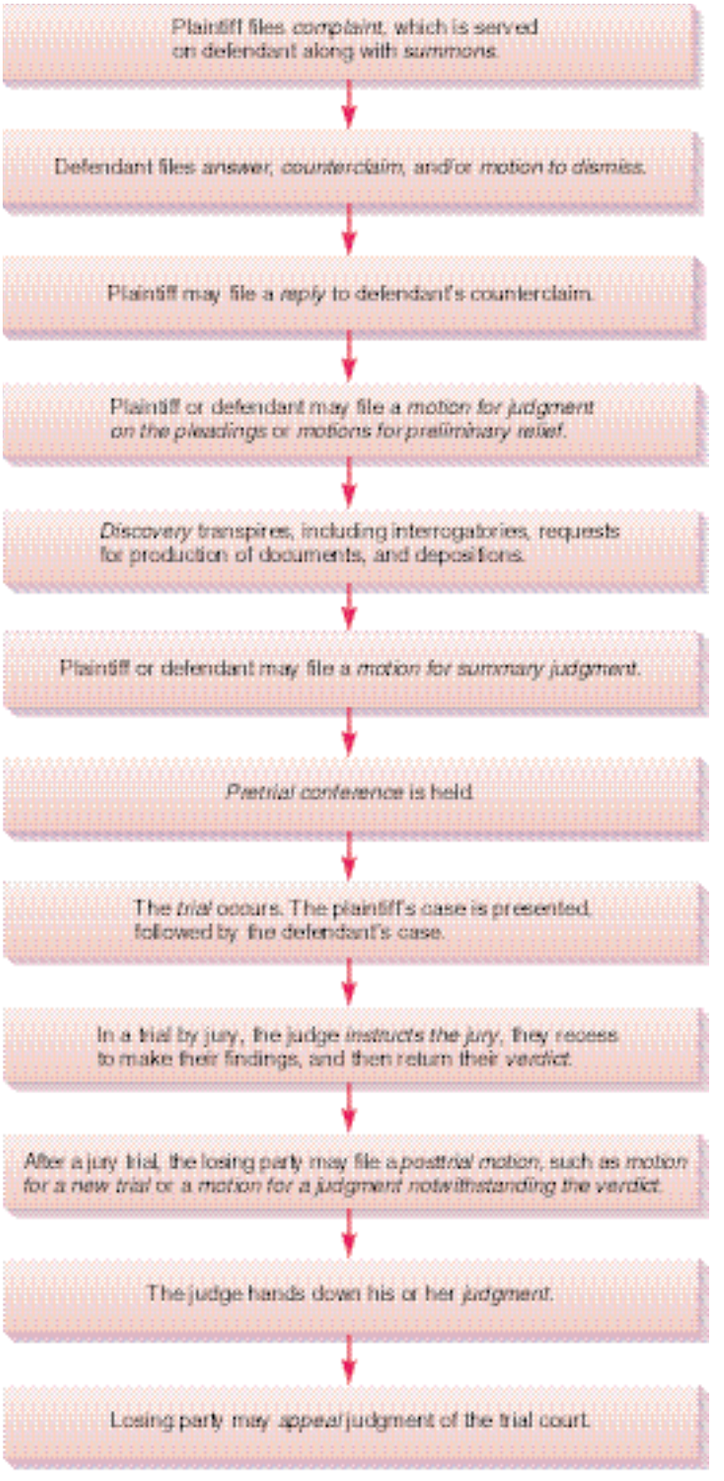


FIGURE 10.10 Events in a civil lawsuit.

Most people consider being convicted of a criminal offense much more serious than losing a civil case, because the former can lead to incarceration while the latter only costs money. Civil judgments can be costly, however. A group of Alaskan fishermen won $5 billion from the Exxon oil company for damages caused by the

1989 *Exxon Valdez* oil spill. Civil cases can be brought in both state and federal court. In 1999, the Atlanta-based Colonial Pipeline Company was ordered to pay over $20 million in damages to local landowners and the state of South Carolina for spilling about 3.5 million liters (nearly a million gallons) of diesel fuel into the Reedy River near Simpsonville, SC. And in January 2000, the Koch Oil Company, one of the largest pipeline and refinery operators in the United States, agreed to pay $35 million in fines and penalties to state and federal authorities for negligence in more than 300 oil spills in Texas, Oklahoma, Kansas, Alabama, Louisiana, and Missouri between 1990 and 1997. Koch also agreed to spend more than $1 billion on clean-up and improved operations.

Sometimes the purpose of a civil suit is to seek an injunction or some other form of equitable relief from the actions of an individual, a corporation, or a governmental agency. You might ask the courts, for example, to order the government to cease and desist from activities that are in violation of either the spirit or the letter of the law. This sort of civil action is heard only by a judge; no jury is present. Environmental groups have been very successful in asking courts to stop logging and mining operations, to enforce implementation of the endangered species act, to require agencies to enforce air and water pollution laws, and a host of other efforts to protect the environment and conserve natural resources. Often, rather than sue a corporation directly for environmental damage, it is more effective to sue the government for not enforcing laws that would have prevented the damage. A big corporation with deep pockets can afford squadrons of lawyers and may have the resources and incentive to tie up litigation for years with motions and counter suits. Federal or state agencies may be more inclined to agree that you are right and to be willing to settle the matter quickly.

Adversarial Approaches and SLAPP suits

The American legal system is adversarial, pitting one side against the other in an effort to distinguish right from wrong, or innocence from guilt. In a trial, each side tries to make the strongest possible arguments for its position, and to point out the faults in the opponent's case. The jury, as neutral fact-finder, hears arguments from both sides and makes an objective decision. We believe that this approach gives the best chance for truth to be discovered. It is time-consuming and costly, however, and doesn't always result in justice. Everyone has heard of cases where it seems perfectly obvious that the defendant is guilty, and yet they get off because certain evidence is inadmissible, or they simply have lawyers who can dazzle or confuse the jury with deceptive arguments. This system promotes strife and confrontation. It doesn't encourage compromise and often leaves lasting hatreds that make future cooperation impossible.

Because defending a lawsuit is so expensive, the mere threat of litigation can be a chilling deterrent. Increasingly, environmental activists are being harassed with Strategic Lawsuits Against Political Participation **(SLAPP)**. Citizens who criticize businesses that pollute or government agencies that are derelict in their duty to protect the environment are often sued in retaliation. While most of these preemptive strikes are groundless and ultimately dismissed, defending yourself against them can be exorbitantly expensive and take up time that might have been spent working on the original issue. Public interest groups and individual activists—many of whom have little money to defend themselves—often are intimidated from taking on polluters. For example, a West Virginia farmer wrote an article about a coal company's pollution of the Buckhannon River. The company sued him for $200,000 for defamation. Similarly, citizen groups fighting a proposed incinerator in upstate New York were sued for $1.5 million by their own county governments. A Texas woman called a nearby landfill a dump—and her husband was named in a $5 million suit for failing to "control his wife." Of course these suits also are expensive for the company or agency that initiates them, but they may be far cheaper than paying a fine or scrapping a big project.

Administrative Law: The Executive Branch

More than 100 federal agencies and thousands of state and local boards and commissions have environmental oversight. They usually have power to set rules, adjudicate disputes, and investigate misconduct. Federal agencies often delegate power to a matching state agency in order to decentralize authority. The enabling legislation to create each agency is called an "organic" act because it establishes a basic unit of governmental organization. In the federal government, most executive agencies come under the jurisdiction of cabinet-level departments such as Agriculture, Interior, or Justice (fig. 10.11).

Agency rule-making and standard-setting can be either formal or informal. In an informal case, notice and background for proposed rules are published in the Federal Register. Opportunities for all interested parties to submit comments are provided. This is often an important avenue for environmentally concerned citizens and public interest groups to have an impact on environmental policy. In formal rule making, a public hearing is held with witnesses and testimony much like a civil trial. Witnesses can be cross-examined. A complete transcript is made and final findings are published in the public record. It is generally more difficult for individuals to intervene in a formal hearing, although sometimes there is an opportunity to submit written comments. Rule making is often a complex, highly technical process that is difficult for citizen groups to understand and monitor. The proceedings are usually less dramatic and colorful than criminal trials, and yet can be very important for environmental protection.

Regulatory Agencies

The EPA is the primary agency with responsibility for protecting environmental quality. Created in 1970, at the same time as NEPA, the EPA is a cabinet-level department, with more than 18,000 employees and 10 regional offices. Often in conflict with Congress, other agencies of the Executive Branch, and environmental groups, the EPA has to balance many competing interests and conflicting opinions. Greatly influenced by politics, the agency changes dramatically depending on which party is in power and what attitudes toward the environment prevail at any given time. Under the Nixon and Carter administrations, the EPA grew rapidly and enforced air and water quality standards vigorously. When Ronald Reagan was elected to office in 1980, however, the EPA took a sharp downward turn. Reagan cut the

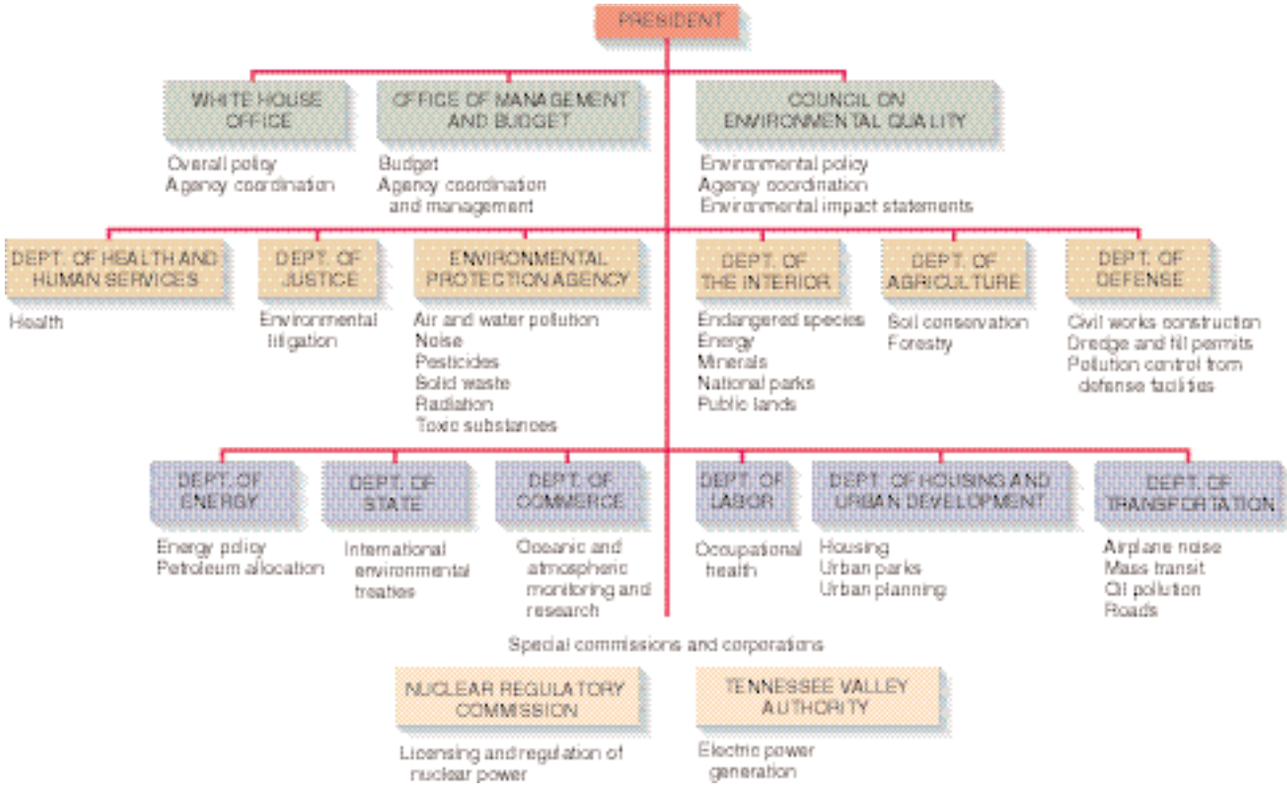


FIGURE 10.11 Major agencies of the Executive Branch of the U.S. federal government with responsibility for resource management and environmental protection.
Source: Data from U.S. General Accounting Office.

research and enforcement budgets by 50 percent. He appointed Anne Gorsuch (Burford)—who openly opposed environmental protection—as head of the agency. During a time when the EPA was being asked by Congress to do more, enforcement actions dropped by more than 70 percent. The agency staff was decimated, with many of the most experienced and effective employees either fired or driven out by frustration. With the election of Bill Clinton in 1992 and the appointment of Carol Browner as administrator, the EPA once again regained its concern for environmental quality.

The Departments of the Interior and Agriculture are to natural resources what the EPA is to pollution. Interior is home to the National Park Service, which is responsible for more than 376 national parks, monuments, historic sites, and recreational areas. It also houses the Bureau of Land Management (BLM), which administers some 140 million ha (350 million acres) of land, mostly in the western United States. In addition, Interior is home to the U.S. Fish and Wildlife Service, which operates more than 500 national wildlife refuges and administers endangered species protection.

The Department of Agriculture is home to the U.S. Forest Service, which manages about 175 national forests and grasslands, totaling some 78 million ha (193 million acres). With 39,000 employees, the Forest Service is nearly twice as large as the EPA (fig. 10.12). The Department of Labor houses the Occupational Health and Safety Agency (OSHA), which oversees workplace safety. Research that forms the basis for OSHA standards is carried out by the National

FIGURE 10.12 A forest ranger explains wilderness rules to a hiker.

Institute for Occupational Safety and Health (NIOSH). In addition, several independent agencies that are not tied to any specific department also play a role in environmental protection and public health. The Consumer Products Safety Commission passes and enforces regulations to protect consumers, and the Food and Drug Administration is responsible for the purity and wholesomeness of food and drugs.

All of these agencies have a tendency to be "captured" by the industries they are supposed to be regulating. Many of the people with expertise to regulate specific areas came from the industry or sector of society that their agency oversees. Furthermore, the people they work most closely with and often develop friendships with are those they are supposed to watch. And when they leave the agency to return to private life—as many do when the administration changes—they are likely to go back to the same industry or sector where their experience and expertise lies. The effect is often what's called a "revolving door," where workers move back and forth between industry and government. As a result regulators often become overly sympathetic with and protective of the industry they should be overseeing.

Administrative Courts

Administrative regulations and rule-making procedures often are objected to by affected parties. Over the past decade, 80 percent of the rules made by the EPA, for example, were challenged in court. It is very unusual for the courts to overturn agency rules, but the challenge buys time for regulated corporations to continue business as usual for a while longer. **Administrative courts** hear challenges to agency rules and regulations. An administrative judge can consider both the validity of the rule and its application to a specific case. If the parties dispute the judge's findings, they can appeal to a district court. The courts rarely overturn agency rules unless (1) the enabling act is too vague or unconstitutional, (2) the agency has gone beyond the scope of power granted by the legislature, or (3) the agency didn't follow proper procedures.

Administrative courts also hear enforcement cases where an individual or corporation has violated an agency rule or standard. Suppose, for instance, that a factory is found to be exceeding allowable air pollution emissions. After an investigation, a complaint is filed with an administrative judge. A hearing is scheduled and the judge listens to both sides of the case and issues an opinion, which is usually a recommendation to the head of the responsible agency for a penalty or remediation action. This decision also can be appealed to the circuit court of appeals.

The rules for evidence are usually less strict in an administrative case than in a criminal action. The administrative judge acts as both fact finder and decision maker. There is no jury. The judge can question witnesses and ask for additional evidence. The emphasis is on finding the truth rather than sticking to strict rules of procedure. Administrative courts often recommend relatively small penalties as a way of encouraging early settlement. In one case, a company charged with a violation of EPA standards was assessed a $500 fine. The company appealed the case to the federal district court, which imposed a $10,000 penalty.

INTERNATIONAL TREATIES AND CONVENTIONS

As recognition of the interconnections in our global environment has advanced, the willingness of nations to enter into protective covenants and treaties has grown concomitantly. Figure 10.13 shows the number of parties participating in some of the most important of these treaties. Note that the earliest of these conventions has no nations as participants; they were negotiated entirely by panels of experts. Not only the number of parties taking part in these negotiations has grown, but the rate at which parties are signing on and the speed at which agreements take force also have increased rapidly. The Convention on International Trade in Endangered Species (CITES), for example, was not enforced until 14 years after ratification, but the Convention on Biological Diversity was enforceable after just one year, and had 160 signatories only four years after introduction. Over the past 25 years, more than 170 treaties and conventions have been negotiated to protect our global environment. Designed to regulate activities ranging from intercontinental shipping of hazardous

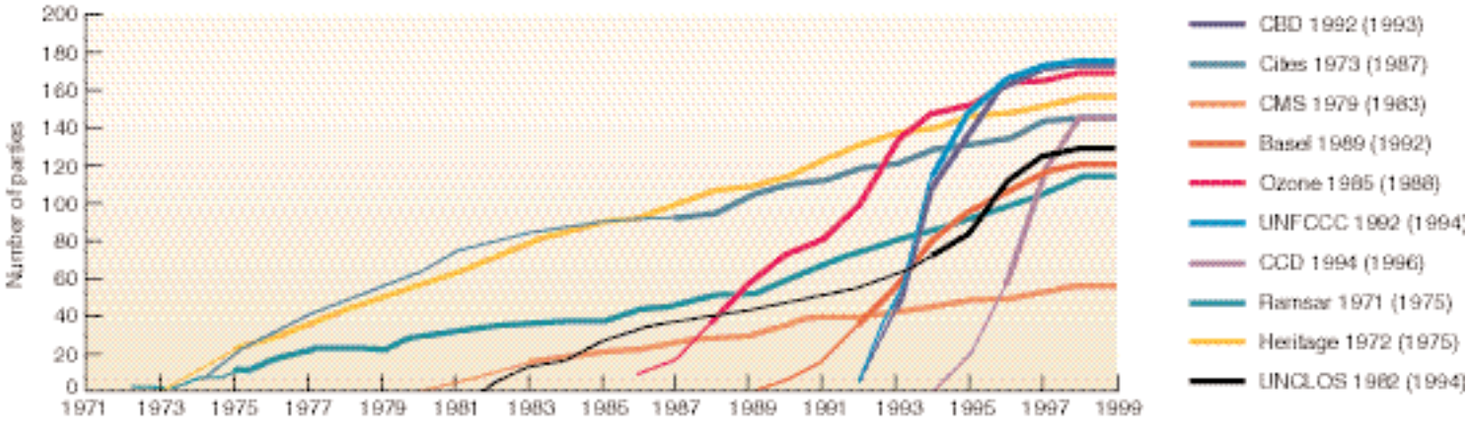


FIGURE 10.13 Additions of participating parties to some major international environmental treaties. The thick portion of each line shows when the agreement went into effect (date in parentheses). See p. 233 for complete treaty names.
Source: United Nations Environment Programme from Global Environment Outlook-2000.

waste, to deforestation, overfishing, trade in endangered species, global warming, and wetland protection, these agreements theoretically cover almost every aspect of human impacts on the environment.

Unfortunately, many of these environmental treaties constitute little more than vague, good intentions. In spite of the fact that we often call them laws, there is no body that can legislate or enforce international environmental protection. The United Nations and a variety of regional organizations bring stakeholders together to negotiate solutions to a variety of problems but the agreed-upon solutions generally rely on moral persuasion and public embarrassment for compliance. Most nations are unwilling to give up sovereignty. There is an international court, but it has no enforcement power. Nevertheless, there are creative ways to strengthen international environmental protection.

One of the principal problems with most international agreements is the tradition that they must be by unanimous consent. A single recalcitrant nation effectively has veto power over the wishes of the vast majority. For instance, more than 100 countries at the U.N. Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992, agreed to restrictions on the release of greenhouse gases. At the insistence of U.S. negotiators, however, the climate convention was reworded so that it only *urged*—but did not require—nations to stabilize their emissions.

As a way of avoiding this problem, some treaties incorporate innovative voting mechanisms. When a consensus cannot be reached, they allow a qualified majority to add stronger measures in the form of amendments that do not need ratification. All members are legally bound to the whole document unless they expressly object. This approach was used in the Montreal Protocol, passed in 1987 to halt the destruction of stratospheric ozone by chlorofluorocarbons (CFCs). The agreement allowed a vote of two-thirds of the 140 participating nations to amend the protocol. Although initially the protocol called for only a 50 percent reduction in CFC production, subsequent research showed that ozone was being depleted faster than previously thought. The protocol was strengthened by amendment to an outright ban on CFC production in spite of the objection of a few countries.

Where strong accords with meaningful sanctions cannot be passed, sometimes the pressure of world opinion generated by revealing the sources of pollution can be effective. NGOs and others can use this information to expose violators. For example, the environmental group Greenpeace discovered monitoring data in 1990 showing that Britain was disposing of coal ash in the North Sea. Although not explicitly forbidden by the Oslo Convention on ocean dumping, this evidence proved to be an embarrassment, and the practice was halted.

Trade sanctions can be an effective tool to compel compliance with international treaties. The Montreal Protocol, for example, bound signatory nations not to purchase CFCs or products made using them from countries that refused to ratify the treaty. Because many products employed CFCs in their manufacture, this stipulation proved to be very effective. On the other hand, trade agreements also can work against environmental protection. The World Trade Organization was established to make international trade more fair and to encourage development. It has been used, however, to subvert national environmental laws. In a ruling in 1998, the WTO forbid the United States from restricting imports of shrimp from Thailand, Malaysia, India, and Pakistan that were caught with nets that trap endangered sea turtles. Similarly, under provisions of the North American Free Trade Agreement, the Ethyl Corporation of the United States sued Canada for $250 million in compensation for banning the manganese-based gasoline additive MMT, which is suspected to be a neurotoxin. Environmentalists are concerned about a powerful international treaty currently being negotiated by the Organization of Economic Cooperation and Development, a group of 29 of the wealthiest countries in the world. The Multilateral Agreement on Investments, or MAI, may be more threatening to social justice and environmental protection than either the WTO or NAFTA.

DISPUTE RESOLUTION AND PLANNING

The adversarial approach of our current legal system often fails to find good solutions for many complex environmental problems. Identifying an enemy and punishing him for transgressions seems more important to us than finding win/win compromises. Gridlocks occur in which conflicts between adversaries breed mutual suspicion and decision paralysis. The result is continuing ecosystem deterioration, economic stagnation, and growing incivility and confrontation. The complexity of many environmental problems arises from the fact that they are not purely ecological, economic, or social, but a combination of all three. They require an understanding of the interrelations between nature and people. Are there ways to break these logjams and find creative solutions? In this section we will look at some new developments in mediation, dispute resolution, and alternative procedures for environmental decision making.

Wicked Problems and Adaptive Management

Rational choice theories of planning and decision making assume that if we just collect more data, buy faster computers to crunch numbers, build more complex models, and spend more money, any problem should be resolvable. More information, it's assumed, will lead automatically to better management. This "bigger hammer" approach may be effective in problems that are difficult but relatively straightforward. Increasingly, however, we have come to recognize that many of the most important problems we face don't fit this pattern. Questions like what ecosystem health means, or how clean is clean, don't have simple right or wrong answers. They depend on your worldview and how you define these terms. Different people come to different conclusions even if they share the same information.

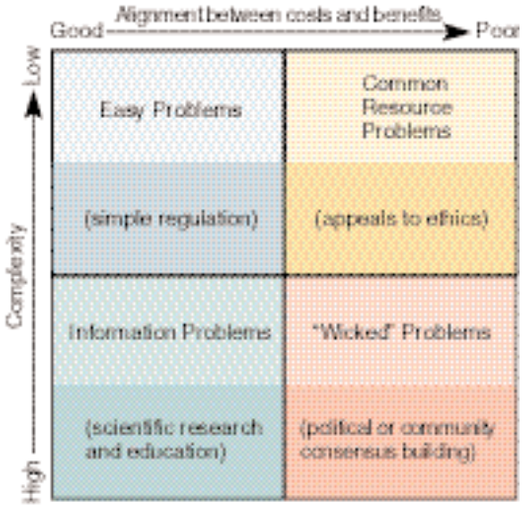


FIGURE 10.14 The difficulty of environmental decision making increases as problems become more complex and the congruence between those who bear costs and enjoy benefits decreases.

Environmental scientists describe problems with no simple right or wrong answers as being **wicked problems,** not in the sense of having malicious intent, but rather as obstinate or intractable. These problems often are nested within other sets of interlocking issues. The definition of both the problem and its solutions differ for various stakeholders. There are no value-free, objective answers for these dilemmas, only choices that are better or worse depending on your viewpoint. Wicked problems are important and have serious consequences, but also are complex and have a poor match between who bears the costs and who bears the benefits on any proposed solution (fig. 10.14). They usually can't be solved by simple rules and regulations, more scientific research, or appeals to ethics. Often the best solution comes from community-based planning and consensus building. Inherent uncertainty gives these questions no clear end point. You cannot know when all possible solutions have been explored.

Recent advancement in understanding how ecological systems work gives us some insight into many wicked problems. Like biological organisms, social problems often change and evolve over time. Their history unfolds in complex ways, depending on chance interactions and unpredictable events. Like ecological systems, there may never be a stable equilibrium in many environmental issues. Each involves an assemblage of issues and actors that are unique in time and place. They can't be standardized. There are no good precedents from previous experience. Their solutions are unique, and what may work today, may not be applicable tomorrow. How can we learn to cope with such uncertainty?

One promising approach to solving wicked environmental problems comes from the work of ecologists C. S. Holling and Lance Gunderson, and planners Steven Light and Kai Lee, among others. Starting with the observation that human understanding of nature is imperfect, this group believes that all human interactions with nature should be experimental. They suggest that environmental policies should incorporate **adaptive management,** or "learning by doing," designed from the outset to test clearly formulated hypotheses about the ecological, social, and economic impacts of the actions being undertaken. Rather than assume that what seemed the best initial policy option will always remain so, we need to carefully monitor how conditions are changing and what effects we are having on both target and nontarget elements of the system. If our policy succeeds, the hypothesis is affirmed. But if the policy fails, an adaptive design still permits learning, so that future decisions can proceed from a better base of understanding. The goal of adaptive management and experimental design is to enable us to live with the unexpected. They aim to yield understanding as much as to produce answers or solutions (table 10.2). This approach to natural resources is similar to—but more explicitly experimental than—ecosystem management (see chapter 2).

Resilience in Ecosystem and Institutions

The great economist Joseph Schumpeter described "waves of creative destruction" that transform economic systems. Another insight from Holling and his collaborators is that similar cycles of destructive creation operate in both ecological systems and in policy institutions (fig. 10.15). This is a familiar process that occurs in secondary succession (chapter 4). The release phase of the cycle occurs when factors such as fires, storms, or pests disturb a biological community, mobilizing nutrients and making space available for new growth. During the reorganization phase, pioneer and opportunist species colonize the new habitat. These species grow rapidly on the accessible carbon, nutrient, and energy sources during the exploitation stage. As the community matures, both the

TABLE 10.2 Institutional Conditions for Adaptive Management

1. There is a mandate to take action in the face of uncertainty.
2. Decision makers are aware they are experimenting anyway.
3. Decision makers care about improving outcomes over biological timescales.
4. Preservation of pristine environments is no longer an option, and human intervention cannot produce desired outcomes predictably.
5. Resources are sufficient to measure ecosystem-scale behavior.
6. Theory, models, and field methods are available to estimate and infer ecosystem-scale behavior.
7. Hypotheses can be formulated.
8. Organizational culture encourages learning from experience.
9. There is sufficient stability to measure long-term outcomes; institutional patience is essential.

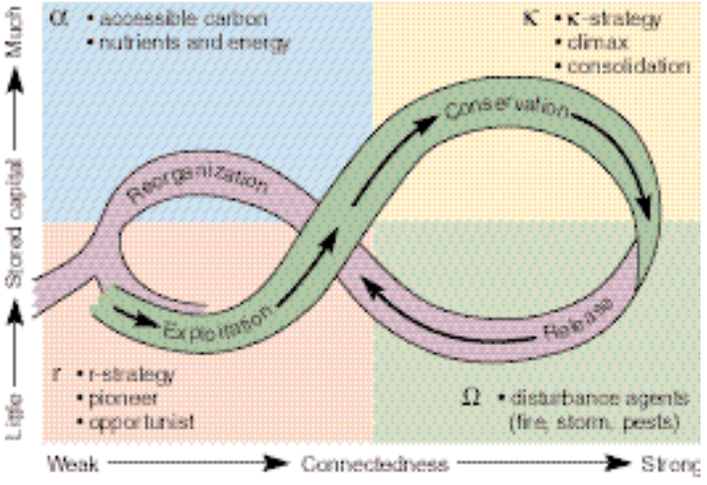


FIGURE 10.15 The creative-destruction cycle. Resilience, or the ability to reorganize and recover from disturbance, is the most important characteristic of both natural and human systems.

stored capital and connectedness increase until the ecosystem reaches a stage at which the system is poised for some new disturbance that starts the cycle again.

The most important characteristic of natural systems is their **resilience,** or ability to recover from disturbance. This doesn't imply that the ecosystem always returns to the exact condition it was in before the disturbance. It may have a new assemblage of species, or different set of physical conditions, but if it is resilient, the system has the ability to reorganize itself in creative and constructive ways. "Environmental quality is not achieved by attempting to eliminate change or surprises," Holling observed. The goal, instead, is resilience in the face of surprise. Surprise can be counted on. Resilience comes from adaptation to stress, from survival of the fittest in a turbulent environment.

In studying a variety of natural resource management regimes, Holling and others observed that human institutions also follow a similar pattern. In studying a variety of natural resource management issues ranging from restoration of the Florida everglades, to control of spruce budworm in New England forests, to cattle grazing in South Africa, to protection of salmon in the Pacific Northwest, they observed that every attempt to manage ecological variables one factor at a time inexorably leads to less resilient ecosystems, more rigid management systems, and more dependent societies. Initial success sets the conditions for eventual collapse. Take the example of forest fire suppression. For 70 years, the U.S. Forest Service has had a very effective policy of putting out all forest fires. The result has been that flammable debris has built up in the forests so that major conflagrations are now inevitable. During this time, however, people have felt safe moving to the borders of the forests and now there is a large population with a huge investment in property that needs to be protected from fire. Furthermore, a big bureaucracy has built up whose raison d'etre is to fight fires. It takes more and more money to forestall a calamity that becomes increasingly likely because of our efforts to prevent it.

What happens in each of these cases is that our goal to control variability in ecological systems leads us to a narrow purpose and to focus exclusively on solving a single problem. But elements of the system change gradually as a consequence of our management success in ways that we did not anticipate. As more homogenous ecosystems develop over a landscape scale, resilience decreases, and it becomes more likely that the system will flip suddenly into a new regime. What can we do to avoid this trap? Table 10.3 suggests some important lessons for ecological managers.

The Precautionary Principle

One response to the uncertainty of wicked problems and chaotic, nonlinear, discontinuous systems is to plan a margin of safety for error or surprises. Drawing on studies of ecological systems, many conservation biologists advocate a **precautionary principle** that says that when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. At a meeting at the Wingspread Center in 1998, an international group of scientists, government officials, lawyers, and grassroots environmental activists agreed on four basic tenets of precautionary action:

- People have a duty to take anticipatory steps to prevent harm. If you have a reasonable suspicion that something bad might be going to happen, you have an obligation to try to stop it.

TABLE 10.3 Planning for Resilience

1. Interdisciplinary, integrated modes of inquiry are needed for adaptive management of wicked problems.
2. We must recognize that these problems are fundamentally nonlinear and that we need nonlinear approaches to them.
3. Interactions between slow ecological processes such as global climate change or soil erosion in the American cornbelt are difficult to study together with the fast processes that bring creative destruction such as potential collapse of Antarctic ice sheets or appearance of a dead zone in the Gulf of Mexico, but we need to look for connections.
4. The spatial and temporal scales of our concerns are widening. We now need to consider global connections and problems in our planning.
5. Both ecological and social systems are evolutionary and are not amenable to simple solutions based on knowledge of small parts of the whole or on assumptions of constancy or stability of fundamental relationships.
6. We need adaptive management policies that focus on building resilience and the capacity of renewal in both ecosystems and human institutions.

Source: L. Gunderson, C. Holling, and S. Light, *Barriers and Bridges to the Renewal of Ecosystems and Institutions*, 1995, Columbia University Press.

- The burden of proof of carelessness of a new technology, process, activity, or chemical lies with the proponents, not with the general public.
- Before using a new technology, process, or chemical, or starting a new activity, people have an obligation to examine a full range of alternatives, including the alternative of not using it.
- Decisions applying the precautionary principle must be open, informed, and democratic, and must include the affected parties.

Opponents of this approach claim that it could prevent us from doing anything productive or innovative. What do you think? Is this just common sense or an invitation to decision paralysis?

Arbitration and Mediation

Another set of alternatives to the adversarial nature of litigation and administrative challenges is the growing field of dispute resolution. Increasingly used to avoid the time, expense, and winner-take-all confrontation inherent in tort law, these techniques encourage compromise and workable solutions with which everyone can live.

Arbitration is a formal process of dispute resolution somewhat like a trial. There are stringent rules of evidence, cross-examination of witnesses, and the process results in a legally binding decision. The arbitrator takes a more active role than a judge, however, and is not as constrained by precedent. The arbitrator is more interested in resolving the dispute rather than strict application or interpretation of the law. Arbitrators must have formal training and be certified by the Federal Mediation and Conciliation Service or the American Arbitration Association. Arbitration is usually an attractive prospect if you don't think you could win a formal lawsuit, but why would anyone agree to arbitration if they think they can win the whole enchilada in court? They might take this route just to avoid disagreeable surprises. Juries can be fickle. Furthermore, they might want to get an unpleasant process over with sooner rather than later. In addition, arbitration often is written into contracts so that the disputants have no choice over the matter.

There are disadvantages to arbitration. It doesn't create a legally binding precedent, something that often is the main motivation for a lawsuit. There is less opportunity to appeal if you don't like the decision you get. There also is less protection from self-incrimination, false witnesses, or evidence you didn't expect. You don't generate nearly as much publicity because the proceedings and record are not public. For some litigants, the publicity generated by a trial is more valuable than the settlement itself. Finally, you are less likely to win the whole thing. Some sort of compromise is the most likely outcome.

Mediation is a process in which disputants are encouraged to sit down and talk to see if they can come up with a solution by themselves (fig. 10.16). The mediator makes no final decision but is simply a facilitator of communication. This process is especially useful in complex issues where there are multiple stakeholders with different interests, as is often the case in environmental controversies. For example, a mediation was attempted to work out policy and management disputes about the Boundary Waters Canoe Area Wilderness in northern Minnesota. Local property owners, resort operators, anglers who wanted to use motorboats on wilderness lakes, wildlife protection groups, wilderness advocates, and the U.S. Forest Service all were represented around the table. Each group had its own agenda, although they all quickly coalesced into pro-motor and anti-motor factions. Interestingly, although we usually think of environmentalists as being relatively disadvantaged in these issues, in this case, the local folks felt they were unfairly outgunned by the high-powered lawyers who represented some of the pro-wilderness and wildlife groups. Although the participants agreed on many points and it seemed as if the mediation was about to come up with a workable compromise, at the last minute everything fell apart and the groups refused to agree about anything. Each side accused the other of intransigence and bad will, and the issues they disagreed upon will likely end up in court.

FIGURE 10.16 Mediation encourages stakeholders to discuss issues and try to find a workable compromise.

This example illustrates both the promises and perils of mediation. It can be quicker and cheaper than court battles. It can lead to compromise and understanding that will lead to further cooperation, and that will solve problems faster than endless appeals. And it may find creative solutions that satisfy multiple parties and interests. On the other hand no one can be forced to mediate or to do so in good faith. Rancorous participants can tie up the process in long, pointless arguments that only make others more angry. Ultimately, there can be a tyranny of the minority. A single person can veto an agreement that everyone else wants. Furthermore, mediation represses or denies certain irreconcilable structural conflicts, giving the impression of equality between disputants when none really exists. Unequal negotiating skills of the participants can lead to unfair outcomes

and even more rancor and paranoia than before the mediation was attempted. As is the case in arbitration, mediation doesn't generate the publicity and complete victory that some groups may desire.

Collaborative Approaches to Community-Based Planning

Over the past several decades, natural resource managers have come to recognize the value of holistic, adaptive, multiuse, multivalue approach to planning. Involving all stakeholders and interest groups early in the planning process can help avoid the "train wrecks" in which adversaries become entrenched in non-negotiable positions. Working with local communities can tap into traditional knowledge and gain acceptance for management plans that finally emerge from policy planning. This approach is especially important in nonlinear, nonequilibrium systems and wicked problems. Among the more important reasons to use collaborative approaches are:

- The way wicked problems are formulated depends on your worldview. Incorporating a variety of perspectives early in the process is more likely to lead to the development of acceptable solutions in the end.
- People have more commitment to plans they have helped develop. The first stage is therefore to identify those involved and to engage them in the process.
- There is truth in the old adage that "two heads are better than one." Involving multiple stakeholders and multiple sources of information enriches the process.
- Community-based planning provides access to situation-specific information and experience that can often only be obtained by active involvement of local residents.
- Participation is an important management tool. Project-threatening resistance on the part of certain stakeholders can be minimized by inviting active cooperation of all stakeholders throughout the planning process.
- The knowledge and understanding needed by those who will carry out subsequent phases of a project can only be gained through active participation.

A good example of community-based planning can be seen in the Atlantic Coastal Action Programme (ACAP) in eastern Canada. The purpose of this project is to develop blueprints for the restoration and maintenance of environmentally degraded harbors and estuaries in ways that are both biologically and socially sustainable. Officially established under Canada's Green Plan and supported by Environment Canada, this program created 13 community groups, some rural and some urban, with membership in each dominated by local residents. Federal and provincial government agencies are represented primarily as nonvoting observers and resource people. Each community group is provided with core funding for full-time staff who operate an office in the community and facilitate meetings.

FIGURE 10.17 The Bay of Fundy has the greatest tidal range in the world. It is the site of innovative community-based environmental planning process.

Four of the 13 ACAP sites are in the Bay of Fundy, an important and unique estuary lying between New Brunswick and Nova Scotia. Approximately 270 km (168 mi) long, and with an area of more than 12,000 sq km (4600 sq mi), the bay, together with the nearby Georges Bank and the Gulf of Maine form one of the richest fisheries in the world. With the world's highest recorded tidal range (up to 16 m or 52 ft at maximum spring tide), the bay sustains a great variety of fishery and wildlife resources, and provides habitat for a number of rare or endangered species. Now home to more than one million people, the coastal region is an important agricultural, lumbering, and paper-producing region (fig. 10.17).

Since European settlement began in 1604, the Bay of Fundy region has experienced great changes in population growth, resource use, and human-induced ecosystem change. More than 80 percent of the saltmarshes present in 1604 have been eliminated or degraded. Pollution and sediment damage harbors and biological communities. Overfishing and introduction of exotic species have resulted in endemic species declines. The collapse of cod, halibut, and haddock fishing has had devastating economic effects on the regional economy and the livelihoods of local residents. Aquaculture is now a more valuable activity than all wild fisheries.

To cope with these complex, intertwined social and biological problems, ACAP is bringing together different stakeholders from around the bay to create comprehensive plans for ecological, economic, and social sustainability. Through citizen monitoring and adaptive management, the community builds social capital (knowledge, cooperative spirit, trust, optimism, working relations), develops a sense of ownership in the planning process, and eliminates some of the fears and sectorial rivalry that often divides local groups, outsiders, and government agents.

On the other hand, giving a greater voice and increased power to local communities isn't always seen as a positive step by those from the outside (What Do You Think? p. 230).

what do you think?

The Quincy Library Group

Northern California has had intense debates about forest management policy for many years. On one hand, many small rural communities are almost totally dependent on the forest industry for economic survival. On the other hand, as native, old-growth forests become increasingly scarce, many environmental groups call for a sharp decrease in logging on public lands, and campaign to preserve as much as possible of what wilderness is left in its original state. The Forest Service is caught in the middle of this debate, with a mandate for both environmental protection and economic production. How can it reconcile these competing demands?

An experiment in community-based environmental planning in the small Sierra Nevada town of Quincy, California, has recently generated a great deal of interest and controversy. Some people praise it as an exciting model for cooperative management, while others deplore it as a fraud and a hoax designed to circumvent existing environmental controls and give away precious natural resources to local industry.

Several wicked problems had led the citizens of Quincy to feel that they were facing a crisis that demanded some drastically new approaches. Decades of fire suppression had left the forest surrounding the town choked with dead trees and woody debris. In the dry climate of the northern Sierras, a catastrophic fire seemed inevitable. Calls for protection of roadless areas and old-growth-associated species such as the marbled murlet and the northern spotted owl, worried the forest products industry that it might not have a continuing supply of wood. With a single-industry economy, and timber harvest down as much as 80 percent from historic highs, Quincy, like many of its neighboring communities, felt like an endangered species itself. Attempts at dialog among the various factions in town usually ended up in shouting matches.

One day in the early 1990s, three Quincy residents with very different backgrounds—a local timber industry employee, an ardent environmentalist, and a county supervisor—got together to talk about their common concerns. Agreeing to meet in the only building in town where they weren't allowed to shout at each other, the Quincy Library Group was born. As other residents joined the conversation, a consensus began to emerge about how the forest could be managed, environmental quality could be protected, and the local economy could survive.

The Quincy Library Plan calls for new management plans on 1 million ha (2.47 million acres) of land on the Plumas, Lassen, and Tahoe National Forests. "Fuel breaks" created by thinning out dense sections of forest would allow harvesting of up to 24,000 ha (60,000 acres) of public land each year. In addition, another 24,000 ha of forest would be harvested to support the local forest industry. Roadless areas, riparian zones, and habitat for endangered species such as the spotted owl would be protected. Hailed as a breakthrough in innovative, cooperative planning, the Library Group's proposal was introduced in Congress by California Senator Dianne Feinstein and Representative Vic Fazio, as an experimental, adaptive management strategy. Each year of the "pilot project" the Forest Service must report on the economic, social, and environmental effects of its actions. After five years of environmental monitoring and science-based assessment, the whole plan will be reexamined.

Failing to muster enough support in Congress to pass on its own, the Quincy Library Plan was attached as a rider on the 1999 Omnibus Appropriation Bill, which was signed into law by President Clinton in 1998. Environmental groups denounced both the method of passage as well as the content of the plan, claiming that it will double the timber harvest in the affected forest region, and subvert existing environmental laws. They claim it is a corporate welfare handout to the Sierra Pacific Industries, and will open the door to privatizing national forests. Interestingly, a split occurred between some national environmental groups, which opposed excess local control, and their northern California chapters, which defended local knowledge and autonomy.

What do you think? Is community-based planning a recognition of the wisdom and practical experience of local residents, or simply a way to give special favors to local industry? Is this courageous innovation, or simply sleeping with the enemy? Is the fact that participants come to understand and like each other a healthy development or the beginning of a sell-out? Would it be better to maintain an adversarial stance in this case, or seek compromise?

Located in the northern Sierra Nevada mountains, the small town of Quincy, California, is the site of a controversial experiment in community-based resource planning.

Green Plans

Several national governments have undertaken integrated environmental planning that incorporates community round-tables for vision development. Canada, New Zealand, Sweden, and Denmark all have so-called **green plans** or comprehensive, long-range national environmental strategies. The best of these plans weave together complex systems, such as water, air, soil, and energy, and mesh them with human factors such as economics, health, and carrying capacity. Perhaps the most thorough and well-thought-out green plan in the world is that of the Netherlands.

Developed in the 1980s through a complex process involving the public, industry, and government, the 400-page Dutch plan contains 223 policy changes aimed at reducing pollution and establishing economic stability. Three important mechanisms have been adopted for achieving these goals: integrated life-cycle management,

energy conservation, and improved product quality. These measures should make consumer goods last longer and be more easily recycled or safely disposed of when no longer needed. For example, auto manufacturers are now required to design cars so they can be repaired or recycled rather than being discarded.

Among the guiding principles of the Dutch green plan are: (1) the "stand-still" principle that says environmental quality will not deteriorate, (2) abatement at the source rather than cleaning up afterward, (3) the "polluter pays" principle that says users of a resource pay for negative effects of that use, (4) prevention of unnecessary pollution, (5) application of the best practicable means for pollution control, (6) carefully controlled waste disposal, and (7) motivating people to behave responsibly.

The Netherlands have invested billions of guilders in implementing this comprehensive plan. Some striking successes already have been accomplished. Between 1980 and 1990, emissions of sulfur dioxide, nitrogen oxides, ammonia, and volatile organic compounds were reduced 30 percent. By 1995, pesticide use had been reduced 25 percent from 1988 levels, and chlorofluorocarbon use had been virtually eliminated. By 1998, industrial wastewater discharge into the Rhine River was 70 percent less than a decade earlier. Some 250,000 ha (more than 600,000 acres) of former wetlands that had been drained for agriculture are being restored as nature preserves and 40,000 ha (99,000 acres) of forest are being replanted. This is remarkably generous and foresighted in such a small, densely populated country, but the Dutch have come to realize they cannot live without nature (fig. 10.18).

Not all goals have been met so far. Planned reductions in CO_2 emissions failed to materialize when cheap fuel prices encouraged fuel-inefficient cars. Currently a carbon tax is being considered. A sudden population increase caused by immigration from developing countries and Eastern Europe also complicates plan implementation, but the basic framework of the Dutch plan has much to recommend it, nevertheless. Other countries would be more sustainable and less environmentally destructive if they were to adopt a similar plan.

FIGURE 10.18 Under the Dutch Green Plan, 250,000 ha (600,000 acres) of drained agricultural land is being restored to wetland and 40,000 ha (99,000 acres) are being replanted as woodland.

SUMMARY

Although "policy" can have multiple meanings, environmental policy, in this chapter, is taken to mean both public opinion as well as official rules and regulations concerning our environment. Although we would like to think that fairness or rational choice and science characterize our political system, power often is the most important factor. The policy cycle describes the steps by which problems are identified and defined, and solutions are proposed, debated, enacted into law, and monitored.

The National Environmental Policy Act (NEPA) forms the cornerstone of both environmental policy and law in the United States. One of its most important provisions is the requirement of Environmental Impact Statements (EIS) for all major federal projects and programs. Laws are rules established through legislation (statutes), judicial decisions (case law), custom (common law), or administrative decisions (administrative law). Over the past century, U.S. policy and law has shifted

from a hands-off attitude toward industry and private property, to end-of-the-pipe command and control, to more collaborative, pragmatic approaches.

Passage of bills in Congress is a convoluted process with many opportunities for amendments and riders to be added. Competing interests "lobby" throughout this process to try to change the outcome. Over the past 30 years, litigation has often been the most effective route for environmental protection. Understanding the differences between civil, criminal, and administrative courts is important in our quest for environmental quality. Establishing standing or the right to be heard in court may be the crucial stumbling block in this effort. SLAPP suits, while often baseless, are intended to intimidate or inactivate environmental groups.

Although many international treaties and conventions have been passed to protect our global environment, most are vague or toothless. Some innovative measures have been devised to compel compliance. Some alternatives to adversarial litigation include arbitration, mediation, and community-based planning. These techniques are useful in complex, unpredictable, multistakeholder, multivalue issues. We call these wicked problems. Learning from ecological systems, we see that some of the main goals for environmental policy and planning should be ecological and institutional resilience and adaptive management. The Netherlands has done one of the best jobs of any nation in using these approaches to formulate a comprehensive "green plan."

QUESTIONS FOR REVIEW

1. What is the policy cycle, and how does it work?
2. Describe the path of a bill through Congress. When are riders and amendments attached?
3. What are the differences and similarities between civil, criminal, and administrative law?
4. List some of the major acts of environmental legislation over the past 30 years.
5. Why have some international environmental treaties and conventions been effective while most have not? Describe two such treaties.
6. What are wicked problems? Why are they difficult?
7. What is resilience? Why is it important?
8. Describe adaptive management.
9. What is collaborative, community-based planning?
10. What is unique about the Dutch green plan?

QUESTIONS FOR CRITICAL THINKING

1. Suppose you had been on the jury in the Woburn case. What evidence would persuade you that the W. R. Grace company was responsible for Jimmy Anderson's leukemia? If other companies also contaminated the Woburn wells, does that exonerate W. R. Grace?
2. What role do you believe fairness, power, and rational choice play in our political process? Would our environmental policies be different if we had a different political system?
3. Which is the most important step in the policy cycle? If you were leader of a major environmental group, where would you put your efforts in establishing policy?
4. Do you believe that trees, wild animals, rocks, or mountains should have legal rights and standing in the courts? Why or why not? Are there partial rights or some other form of protection you would favor for nature?
5. It's sometimes difficult to determine whether a lawsuit is retaliatory or based on valid reason. How would you define a SLAPP suit, and differentiate it from a legitimate case?
6. Try creating a list of arguments for and against an international body with power to enforce global environmental laws. Can you see a way to create a body that could satisfy both reasons for and against this power?
7. Think of a familiar example of a wicked environmental problem. What are the most important elements that make it wicked? What institutional changes could we implement to make this issue less wicked?
8. The Holling diagram for the creative-destruction cycle (fig. 10.15) is described in terms of ecological change. Try applying this model to cycles of change in human institutions. Describe the actors, conditions, and forcing factors in each of the four quadrants of the model.
9. Take a current wicked environmental problem. If you were an environmental leader trying to resolve this problem, would you choose litigation, arbitration, or mediation? What are your reasons for favoring or rejecting each one?
10. Based on the information you have now, do you favor or oppose the Quincy Library Plan? What additional information would you need to make a good decision about this case?

KEY TERMS

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administrative law 215
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case law 215
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criminal law 220
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ADDITIONAL INFORMATION ON THE INTERNET

Visit our website at /http://www.mhhe.com/environmentalscience for specific information about each of the topics below:

League of Conservation Voters
Center for International Ecological Law
Environmental Defense Fund
Natural Resource Defense Fund: legislative watch
West Coast Environmental Law (British Columbia)
Earth Justice
Natural Resources Defense Council
Environmental Law sites
Union of Concerned Scientists: activist scientists on public policy
Congress News, from C-SPAN

SOME IMPORTANT INTERNATIONAL TREATIES

CBD: Convention on Biological Diversity 1992 (1993)
CITES: Convention on International Trade on Endangered Species of Wild Fauna and Flora 1973 (1987)
CMS: Convention on the Conservation of Migratory Species of Wild Animals 1979 (1983)
Basel: Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal 1989 (1992)
Ozone: Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer 1985 (1988)
UNFCCC: United Nations Framework Convention on Climate Change 1992 (1994)
CCD: United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa 1994 (1996)
Ramsar: Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (1975)
Heritage: Convention Concerning the Protection of the World Cultural and Natural Heritage 1972 (1975)
UNCLOS: United Nations Convention on the Law of the Sea 1982 (1994)

PROFILE

Environmental Affairs Coordinator

Kristin Groce

Growing up in southeast Chicago, Kristin Groce experienced some of the urgent social and environmental problems of an aging urban industrial center (see p. 547 Chapter 24). A high school environmental science course piqued her interest in improving environmental quality in her neighborhood. It also showed her that not all businesses are bad; they can be valuable partners in community development. Tutoring and participating in the African American Association in high school increased her social awareness. Being a member of the dance line introduced her to racial diversity and cooperation.

After high school, Kristin looked at many different colleges. She chose Jackson State University in Alabama because of the friendly people she met there, and the beautiful forests surrounding the campus. She majored in biology, with a concentration in environmental science and a minor in business. This unusual combination has proven to be great for her present job at the Southeast Chicago Development Commission (SCDC) where, as Environmental Affairs Coordinator, she works with businesses, community, and environmental groups to revitalize the local economy and clean up the environment.

As a senior in college, Kristin was beginning to think about jobs. She visited her college career office and searched the Internet and newspapers for job opportunities, but her best lead was from her grandmother, who saw an announcement advertising openings at SCDC. Kristin applied and was offered a job. One of the projects she has worked on is native landscaping of an industrial corridor that both beautifies the community and also gives a better image to local businesses. She also coordinates an environmental education program for local school children, and oversees a service learning program for high school students. She also is involved in wetland cleanup projects, preserving local natural areas, pollution prevention plans for industry, and purchasing of new energy-efficient equipment. Community development for SCDC means revitalizing the local economy, as well as improving social and natural capital.

An understanding of how business works has turned out to be invaluable for Kristin. Among the other college courses she finds very useful are communications, writing, computer skills, and biology. She wishes now that she had taken more courses to learn about native species and ecosystems, but she is learning a great deal on the job. Being able to work with a wide variety of people—from school kids, to business people, to grandmothers—has proven to be a key to her position.

When asked what she likes best about her present job, Kristin says that she loves being able to work with so many different people in the community in which she grew up. “I didn’t realize,” she says, “that I could come back home to improve the situation here and create jobs.” When asked what she likes least about her job, Kristin replies that she often feels caught in the middle between community factions and businesses that just don’t get along. She wishes that cooperation and understanding between different groups were easier to attain.

At some point, Kristin says she probably will go back to school for an MBA or engineering degree so she can work for a consulting firm or become an environmental compliance officer in a corporation. She might also be interested in an environmental career in government, but for now, she feels good about being able to help her community and do something positive for both the people and environment in her own neighborhood.