CHAPTER 3

# Individuals, Society, and Conservation

Human impacts on the global biosphere now control many facets of ecosystem function (Palumbi 2001). In addition to altering global ecology, technological and human population growth also affects evolutionary trajectories, dramatically accelerating evolutionary change in other species, especially in commercially important pest and disease organisms. There are, perhaps, 1.4 million living species known to science and as many as 14 million in total (Wilson 1999a). Most (98 percent) birds are known; 1.5 percent of algae have been described; and bacteria constitute a black hole, with less than 1 percent of species described. On the other hand, more than 98 percent of the species that have ever lived have vanished, and many ecologists believe we are facing an unprecedented wave of extinctions owing to habitat destruction, spread of exotic species, pollution, overharvesting, and disease. The importance of biodiversity is twofold (Wilson 1999a): (1) the more species living in an ecosystem, the higher its productivity and the greater its ability to withstand drought and other kinds of environmental stress, and (2) biodiversity contributes to clean water, enriched soils, clean air, pharmaceuticals, crops, and fibers. However, care must be taken not to confuse the issues around biodiversity and to create subterfuges for the economic importance of noncommodities, even if these resources

have noneconomic aesthetic values, such as a beautiful landscape (Ehrenfeld 1976). Maintaining biodiversity can be seen as a moral obligation to avoid destroying creation (Wilson 1999a). All environmental problems are innately ethical, seeking a right relationship between people and other living things and between generations. Every society has three forms of wealth—material, cultural, and biological—and the responsibility not to diminish this wealth for future generations.

Human health and well-being fundamentally depend on a clean and steady supply of water and fertile soil to produce renewable resources for food, fiber, and other products (Szaro et al. 1999). We have gone from a world relatively empty of humans to one full of humans. Ecosystem services necessary to the function of Earth's life-support systems are also necessary for economic production and human welfare (Costanza et al. 2000). There is a consensus among a broad spectrum of scholars that the scope and magnitude of environmental problems threatens the sustainability of Earth's life support systems (Dasgupta et al. 2000). At the Earth Summit in Brazil 1992, there was universal agreement that conservation of biodiversity is a serious global concern. However, there was intense disagreement on how to balance conservation with social, economic, and sustainable-use factors (Szaro 1996). This disagreement is in part due to the principles of sustainable governance (responsibility, scale-matching, precaution, adaptive management, full cost allocation, and participation) (Costanza et al. 2000), which are at odds with the law of the commons, the psychology of large groups that leads to diffusion of responsibility, gross socioeconomic inequities within and among nations, histories of racial discrimination and economic exploitation, the lack of universal democratic government, variation in worldviews of nature, intentional and unintentional obfuscation, a predominance of free-market economics, self-interest, and greed. Davidson (2000) believes the Malthusian-Ehrlich-Meadows-Daly limits to growth paradigm is not useful ecologically or economically and politically hinders conservation. Its use has been similar to "crying wolf" and blaming the poor.

A tapestry paradigm (fig. 8) is a useful alternative to the limits and optimist paradigms. It is clear that (1) humans can destroy the environment, (2) any specific natural resource is finite, and (3) biological and physical systems underlie all economic activity and provide constraints. However, biophysical limits have rarely limited economic growth because ways are found to adapt and continue to expand. Continued economic growth has not caused collapse, but has continued environmental degradation. The limits paradigm focuses

on resources, consumption, and human population. Examination of social structures of production and consumption offer greater hope for understanding and slowing environmental destruction. In the tapestry paradigm, economic growth means increased efficiency of material use (less waste and more recycling) and value-added manufacturing (developing systems that, e.g., harvest trees, make lumber and pulp, recycle waste chemicals from the pulp, use sawdust and trim slabs for fuel, produce furniture, and so on). Economic development provides for increased human welfare without increased use of resource or increased production of waste. The difference between growth and development is at the heart of general sustainability (Goodland 1995). Alleviating human misery and poverty is essential to solving global environmental problems. In the United States, there is not as profound a connection between poverty and conservation because social institutions are well developed and the economy is diversified and based more on development than on growth in use of renewable resources (imports substitute for growth and shift the negative effects of growth to other societies). Nevertheless, progress in conservation in the United States still depends on progress in developing a general—environmental, economic, and social—sustainability.

At the heart of ecological productivity is biodiversity. Biodiversity is an inherent property of all ecosystems. Most management issues are concerned with a small proportion of total biodiversity—ensuring adequate levels of ecosystem function is more important than the total number of species. Moreover, species diversity can change in response to both natural processes and human actions. Changes in species diversity usually indicate that either physical or biotic conditions have altered; these alterations may have impacts

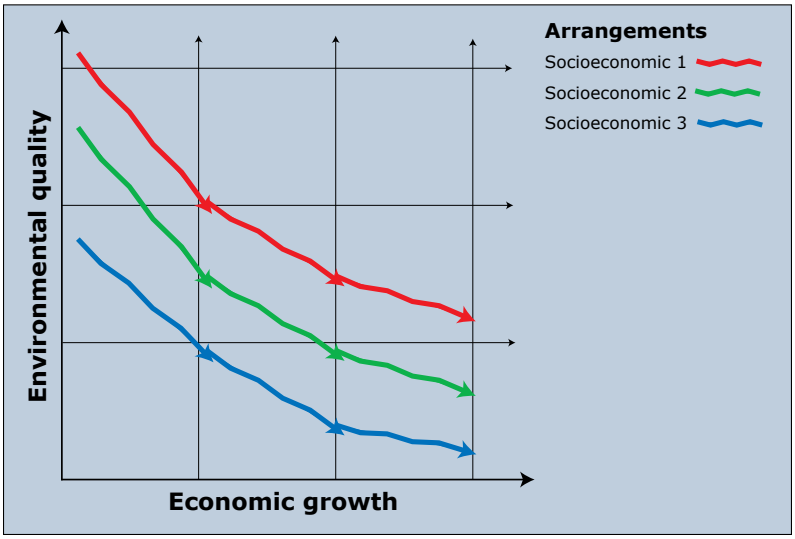


**Figure 8**—The tapestry paradigm, an alternative to limits to growth: Managing the socioeconomic structure of production can contribute to sustainability through development rather than growth (adapted from Davidson 2000). Under all three socioeconomic arrangements, increased growth leads to decreased environmental quality. However, socioeconomic arrangement 1 provides much higher environmental quality for a given level of growth than arrangements 2 or 3.

on human welfare. Species diversity is influenced by the physical conditions of climate, nutrient availability, physical structure or heterogeneity, and environmental disturbance. Biological interactions include competition, predation, mutualisms, parasitism, and disease. Thus, biodiversity is a complex function of the interaction of physical and biotic factors. This suggests that the severity of impacts of management on species diversity should be evaluated in relation to the background of natural influences on species diversity. Invasion and spread of nonnative species are leading threats to genetic and species diversity in wildlands and also have potential to adversely affect human welfare. Sustainable resource management requires understanding factors that regulate species diversity, specifically those factors that either increase or decrease genetic and species diversity.

> I know no safe depository of the ultimate powers of society but the people themselves and if we think them not enlightened enough to exercise their control with wholesome discretion, the remedy is not to take it from them, but to inform their discretion by education (Thomas Jefferson in a letter to William Charles Jarvis, September 28, 1820, cited in Maser et al. 1998).

## Ways of Thinking, Learning, and Knowing

The ways people dwell in the natural world inspire the ways they understand, explain, and look at nature because both sociology and nature influence their conceptions and attitudes toward nature (Rozzi 1999). We have inherited ways of thinking based on millennia of slow growth or no growth (Ehrenfeld 2002) and selective pressures from immediate, highly certain, threats to individual survival (Ornstein and Ehrlich 1989). Kaufmann et al. (1994) summarized the tension from mixing short-term and long-term aspects of human-ecosystem interaction: in the short run are the demands for goods, services, and economic livelihood; in the long run are opportunities for subsequent generations. The resolution must be a shift in focus from sustaining production of goods and services to sustaining ecological, social, and economic systems. But we need to understand how to get people to agree on some common visions.

Social consensus can be thwarted by people's different ways of knowing. One form of knowledge rarely considered has to do with meanings of place; these meanings are exemplified in traditional aboriginal environmental knowledge and management systems (Sherry

and Myers 2002). These systems constitute credible worldviews that incorporate an information base, a paradigm, norms and customs, objectives, social sanctions, and extensive teaching. In contrast, our modern state worldview incorporates selective data-based science, value-free problemsolving, professional administration, written laws and regulations, and top-down control. Sherry and Myers (2002) say the state worldview is a predatory model of hunter behavior combined with the tragedy of the commons that results in competition, individuality, property, and control, compared to the Gwitchin model of everything is alive, we are all relatives, use of the environment is a privilege, take only what you need and use what you take, with the individual and collective obligated to act responsibly for the benefit of future generations (see also Ford 2001, Krech 1999, Striplen and DeWeedt 2002, Wright 1992). Ancient conceptualizations defined ecosystems both in terms of discrete geographical boundaries (e.g., a watershed) and abiotic and biotic factors including people (Berkes et al. 1998). For example, Pacific Northwest family groups claimed watersheds as their domains, 15th-century Turks instituted watershed conservation, 15th- and 16th-century Inca developed a regional general sustainability, 17th-century Chinese planted trees for river conservation, and 17th-century Swiss used watersheds in an integrated fashion. Traditional ecological knowledge incorporated concepts of unpredictability, uncontrollability, nonlinear processes, multiple equilibria, and surprises. Traditional knowledge also depicted ecosystems as alive, encompassing people and, in some cases, spirits of animals, other natural objects, and human ancestors. The land was alive and full of life force (Berkes et al. 1998). Of course, peoples in every time and place exhibited intelligence, self-interest, flexibility, and ability to make mistakes (Krech 1999), but rarely as much self-interest, greed, and disdain of equity as the European invaders of the "New World" (Wright 1992).

Culture is the "hidden hand of land use planning" (Geisler and Daneker 2000). Race, class, and gender influence attitudes toward the environment within cultures (Taylor 2002). The cultural landscape defines the physical landscape. Culture is a people's cumulative way of life, material and nonmaterial. Culture comprises morals, art, custom, language, religion, law, property rights, and other group values. It marks the corners and edges of places—which will be sacred and which will be sacrificed. The French preferred long, linear boundaries resembling alleyways, whereas the English preferred polygons. Thomas Jefferson invented the Township-Range-Section grid of modern American land boundaries (Geisler and Daneker 2000). Culture defines the aesthetics and ethics of the lands. For

example, in ancient Israel, land holdings were reshuffled every 50th year. Native Americans often had communal ownership. John Locke asserted that land was a gift to all from God but subject to sole ownership if changed or improved, a concept adopted in the United States in disposing of its large, federal landholdings. Deep within American culture exists two contrasting prescriptions for individual happiness and public interest (Geisler and Daneker 2000): (1) private ownership as a practical extension of possessive individualism and (2) public ownership of land and natural resources as a superior, long-term form of stewardship and an ecologically sound land ethic. This dissonance most likely arose from the European experience. In 1600, the population of France and England was hundreds of times greater than the 4 to 7 million Native Americans; Europeans had profoundly altered their landscapes—they had cleared over 205,000 square kilometers of forest for agriculture, and then an additional 65,000 square kilometers in the next century to satisfy demand for charcoal for smelters and naval supplies for ships (Krech 1999).

Individual experience can be as fundamental as culture. Yukio Mishima (2003) declared that the physical experience of nature and matter ("sun and steel") has profound effects on the mind. Knowledge gained from physical experience is diverse: practical action in nature leads to the discovery of knowledge, knowledge acquired by labor becomes second nature, and everyday thinking and action lead to common sense. Informal attempts to resolve conflicts about management of nature in the Pacific Northwest have spawned numerous anecdotes about how field trips provide physical and mental experiences of actual places and organisms that can override position-based thinking based on worldviews. A concept rejected as false based on habitual thought, worldview, or culture can be easily grasped when personally experienced. Perhaps, separation of the physical self from the nature at hand and developing attitudes, opinions, and worldviews by using primarily the mind and mutually reinforcing interpersonal communications helps account for the extreme differences in views about how and what to conserve in nature. The late David Bohm (1994) made a compelling proposal that body, emotion, intellect, and reflexive reactions based on memory together constitute much of our thought. Through repetition, emotional intensity, and defensiveness, reflexive thought becomes hard-wired in our consciousness. Bohm asserted that thought and knowledge are primarily collective phenomena—our belief in our own uniqueness and originality is often an illusion. Thus, he notes that flow of meaning among individuals is more fundamental than any individual's particular thoughts. Cognitive psychologists have long recognized that

the mind works like a file cabinet; each significant new experience creates a folder of emotion and reaction; every subsequent similar experience opens that folder and reinforces the behaviors in it. As experience accumulates, it becomes more difficult to add folders (and perspectives) because there will be one with some similarity to the current event. A strong (positive or negative) experience that contradicts the information in the folder is required to create new reactions (ways of thinking). For example, space becomes place through experience, cultural transmission of meanings, and defining events or moments (Beckley 2003). Perhaps this is how the collective field trip is experienced—a positive social event, aimed at reconciliation, in an aesthetic, natural environment, ideally with one or more good interpreters of nature and people's ways of thinking.

A variety of colors of fallen leaves blanket the forest floor in a riparian area of the North Fork Quinault River, Olympic National Park. Photo by A. Wilson.

Experiences of the few can sway entire cultures when artfully expressed. We spend our lives immersed in stories—those in newspapers, books, television programs, plays, motion pictures, politicians' speeches, ministers' sermons—that entertain, inform, teach, and deeply move us (Simpkinson and Simpkinson 1993). These stories tell us "who we are and how we relate to the world." The stories of the Kalahari Bushmen provide them with potent reminders of the way in which inner and outer, individual and community, and human community and natural world are inextricably linked. Even though it seems that the Western contemporary world finds it difficult to hear the "words of the ancestors," African, Asian, Native American, and Scandinavian myths and fairy tales have provided a treasure trove from which great interpreters—Joseph Campbell, Bruno Bettelheim, Robert Bly, Clarissa Pinkola Estés, Michael Meade—relate to us our basic relationships with each other and the world. Roman Catholic biographies of saints tell stories of exemplary lifestyles in the face of adversity. In the Pacific Northwest, from Cougar, Washington, to La Grande, Oregon, small restaurants and country stores sell books and pamphlets on local history, logging, ranching, settlers, and Native Americans (see e.g., Trosper 1985, 1987, 1992, 1995; Wallace 1997, 1998). These stories instill local pride and belonging and reinforce cultural values through shared experiences. Native Americans sometimes refer to stories as a "map in the head," a metaphor for finding the place that connects chaos and order (Peat 1993).

Peat (1993) believes "science is the creation of stories that interpret the interconnectedness of the universe." Examples range from Charles Darwin to John Muir to Aldo Leopold to Rachel Carson. Despite few having experienced the environments that led Darwin to his theories of evolution, Darwin's metaphors are now established cultural messages. Compelling metaphors can combine

**Sidenote 13**—The Myers-Briggs Type Indicator and Herrmann Brain Dominance Assessment have long been used by organizations as a tool to encourage discussion about personality, temperaments, and preferences in the various ways of thinking. Both help to improve understanding of self and others, enhance communication, encourage teaching and learning, and build partnerships. Participants of collaborative management may consider using these helpful tools.

**For further reading:**

- **Keirsey, D.; Bates, M. 1984.** Please understand me: character and temperament types. Del Mar, CA: Prometheus Nemesis Book Company. 210 p.
- **Herrmann, N. 1996.** The whole brain business book. New York: McGraw-Hill. 334 p.

**Or visit the following Web sites:**

- www.hbdi.com/
- www.myersbriggs.org/

with worldviews to provide a perspective of nature that may be either reinforced or found to be unsupportable in the experience of nature. The "tree of life" relates the common biological origins of all species, suggests kinship that requires ethical respect, and promotes the intrinsic value of all life. The "web of life" relates the value of biodiversity for human survival and an environmental ethic that produced ecological economics, utilitarian approaches to conservation, and the concept of interdependence. But more than culture (and mythologies), metaphors, experience, and science shape the four major views of the natural world that Regier (1993) identified: (1) the free-market economist who promotes development, (2) the environmental economist who practices conservation, (3) the naturalist preservationist who values ecosystem health, and (4) the extentionist preservationist who sees all species as equal and who values wilderness.

Subcultural philosophies and individual preferences for particular ways of thinking (cognitive preferences) cause people to self-select occupations and vocations and underlie the conduct of the sciences that inform various worldviews and influence the understanding that results from research. Both within the subculture of scientists and within culture as a whole, individuals exhibit preferences for thinking that readily accept some kinds of information and reject or discount other, often equally valid, kinds of information (Coulson and Strickland 1983, Herrmann 1996, Mintzberg 1975) (sidenote 13). Economists, engineers, and the "rational economic man" will seek, analyze, and apply hard data amenable to linear, reductionistic thinking. A sociologist, nurse, teacher, or musician will accept statements of feeling and qualitative evaluation of ethics and aesthetics more readily than the analytic, linear thinkers. A policeman, minister, and agency line officer will look to tradition, rules, regulations, and laws. Holling et al. (2002a) report that conservationists emphasize ecology and evolution (abstract integrative thinking that produces idealized states of nature) and ignore economics that emphasizes synergy, human ingenuity, enterprise, and flexibility. Economists and developers emphasize free market models (according to a narrow economic dogma emphasizing rational, linear thinking and analysis of a narrow set of variables) and ignore the uncertainties of nature. Sociologists and community activists place faith in community and social organizations (with a thinking that emphasizes care for people and interpersonal relationships) and presume nature presents no limits to the imagination and initiative of local groups. All these views are correct, but they are all partial, too simple, and lack an integrative framework (Holling et al. 2002a).

These contrasting alternative views of nature, like the metaphor of a group of blind men examining an elephant (each limited to a particular anatomical part) would be amusing if not for the consequences to nature, local economies, communities, and the spirit of individuals.

Thus, it should be no surprise that experiential learning becomes essential in tempering worldviews based on thought. And group experiential learning may be the key to finding creative integration of worldviews in formulating pragmatic and potentially successful approaches to conservation (table 8). Political strategies of various groups (1) attempt to change the terms of political discourse, one emphasizing nature as natural resources, another nature as the human environment; (2) constitute tangible forums within civil society to use the communicative power of public opinion—yet some forums will be convened by offroad vehicle activists, others by environmentalists, and yet others by economic-development interests; (3) draw upon government fears of political instability—demonstrations, civil disobedience, and violence are being used routinely by diverse interests; and (4) create paragovernmental activity, such as the Forest Stewardship Council and the timber industry establishing competing sustainable forestry standards and certification, conservation groups and industry both offering school curricula and extension services, and innumerable other approaches (Schlosberg and Dryzek 2002).

**Table 8—Five alternative views of nature—**Balance leads to Malthusian determinism; anarchy leads to a conclusion that spatial heterogeneity is the critical ingredient for persistence in an unstable world.[a]

| View | Stability | Processes | Policies | Consequences |
|---|---|---|---|---|
| Nature flat | ▪ None | ▪ Stochastic | ▪ Random | ▪ Trial and error |
| Nature balanced | ▪ Globally stable | ▪ Negative feedback | ▪ Optimize, return to equilibrium | ▪ Pathology of surprise |
| Nature anarchic | ▪ Globally unstable | ▪ Positive feedback | ▪ Precautionary principle | ▪ Status quo |
| Nature resilient | ▪ Multiple stable states | ▪ Exogenous input and internal feedback | ▪ Maintain variability | ▪ Recovery at local scales or adaptation; structural surprises |
| Nature evolving | ▪ Shifting stability landscape | ▪ Multiple scales and discontinuous structures | ▪ Flexible, actively adaptive, probing | ▪ Active learning, new institutions |

[a] Resilience leads to an emphasis on keystone species and key functional groups and abiotic and biotic processes; evolution leads to systems approaches. Sustainable relationships between people and nature require ecosystem resilience and a shift from command-and-control to adaptive management.
Source: Hollings et al. 2002a.

**Sidenote 14—"Pathologies of regional resource management"**—Northern California provides a rich tapestry of conflicts and pathologies in regional resource management and the emergence of a variety of communal solutions to environmental problems. Judi Barr (1994) tells her personal, tragic story of an activist crippled by a car bomb, but resolute in seeking justice in conflicts over redwoods. David Harris (1996) relates a story of Pacific Lumber Company's hostile takeover and the resultant social and ecological turmoil caused by a shift from stewardship to exploitation. Ted Simon (1994) presents a case history replete with differences in culture, worldviews, politics, cognition, and personality in his story of Richard Wilson's personal evolution from republican-patrician-entrepreneurial rancher to community activist and conservation group leader (and eventually head of the California Department of Forestry) in his fight to save his ranch, Round Valley, and Covelo, California, from inundation as a water reservoir for Los Angeles. Simon brings a perspective eye, a sympathetic ear, and a decentered view to his subjects. His ability to perceive and describe compassionately the diverse characters in conflict in his story arose, perhaps, from his own personal evolution during a 4-year exploration of the length and breadth of the major continents of the world, alone, on a motorcycle (Simon 1981)—a journey during which his very survival necessitated acceptance, understanding, and adaptation to diverse cultures, religions, and individuals.

Incorporating critical reviews of historical interactions between people and nature at regional scales helps to extend the collective experience. Holling et al. (2002a) recounted four resource management failures: (1) collapse of fisheries in spite of widespread public support and highly developed science; (2) moderate stocking of cattle in semiarid rangelands that increased vulnerability to drought; (3) pest control that led to pest outbreaks becoming chronic; and (4) flood control and irrigation that incurred large economic and ecological costs. They concluded that the observed pattern of failure is one of resources appropriated by powerful minorities capable of influencing public policy to provide perverse subsidies that lead to resource depletion. The fundamental cause of failure is the political inability to deal with the needs and desires of people and with rent seeking by powerful minorities. Contributing causes are the narrowly focused ways that many, including scientists and analysts (especially ecologists, economists, and institutional analysts), perceive and study the natural world and provide unintended opportunities for political manipulation (sidenote 14). The fundamental cause is the "Pathology of Regional Resource and Ecosystem Management," and the contributing cause is the "Trap of the Expert." The former reflects the detachment from nature, place, and communities; the latter, ways of thinking. Holling et al. (2002a) added that obstacles arise from multiple, competing scientific perspectives and disciplinary hubris.

Three philosophical positions underlie the accumulation of new knowledge known as science (Czech 2001): (1) realism, wherein the goal is to build knowledge of reality by following a clear rationale and subjecting it to critique; (2) idealism, wherein paradigms provide knowledge independent of reality; and (3) empiricism, wherein all knowledge originates in experience. Thus, a holistic philosophy of science requires the use of ontology, epistemology, logic, aesthetics, and morals (Czech 2001). Pure science is the search for knowledge for its own sake. Moral science, however, is accountable to the society that hosts it. The moral philosophy is that science should seek knowledge with a goal of improving the human condition, a consideration often overlooked. Humans, however, have a great appreciation for the aesthetics of other species, and the majority of Americans approve of the Endangered Species Act. Americans value conservation of other species as highly as economic growth or property rights. Thus, public institutions have an obligation to gather knowledge and take action to protect species from endangerment. Knowledge, however, transcends scientific knowledge and includes mathematical proofs, memorized experiences, common

sense, intuition, metaphysics, and art as a way of knowing. Camille Paglia (1990), e.g., demonstrates the knowledge in art. Scientists, technologists, and managers do not have a monopoly on knowledge, cognition, or intelligence. Traditional ecological knowledge of indigenes includes a wealth of local observations at the level of populations and species over long periods that produce holistic perceptions of the natural environment and the place of humans in nature (Ford 2001). Conventional science usually is limited to investigations in a small area during a limited time and, thus, is not well suited to recognizing, analyzing, and responding to emergent properties of complex systems. Thus, various sources of knowledge are required before an integrated view of a complex and self-organizing system such as an ecosystem or a society can be gained.

People have preferences in their ways of thinking (fig. 9) that influence the way they perceive the world or any particular problem, information they will assimilate readily, and the processes by which they arrive at decisions (Carey 1997). For example, an engineer (analytical thinker) might prefer a modeling process using a linear programming model, whereas a holistic health care consultant (people-oriented thinker) might prefer a group decision process including the patient. The ways in which worldview and cognition affect how people perceive issues around biodiversity were amply illustrated at the proceedings of the 1982 national symposium on how to implement the diversity provisions of the National Forest Management Act (NFMA) (Cooley and Cooley 1984). The former Chief of the

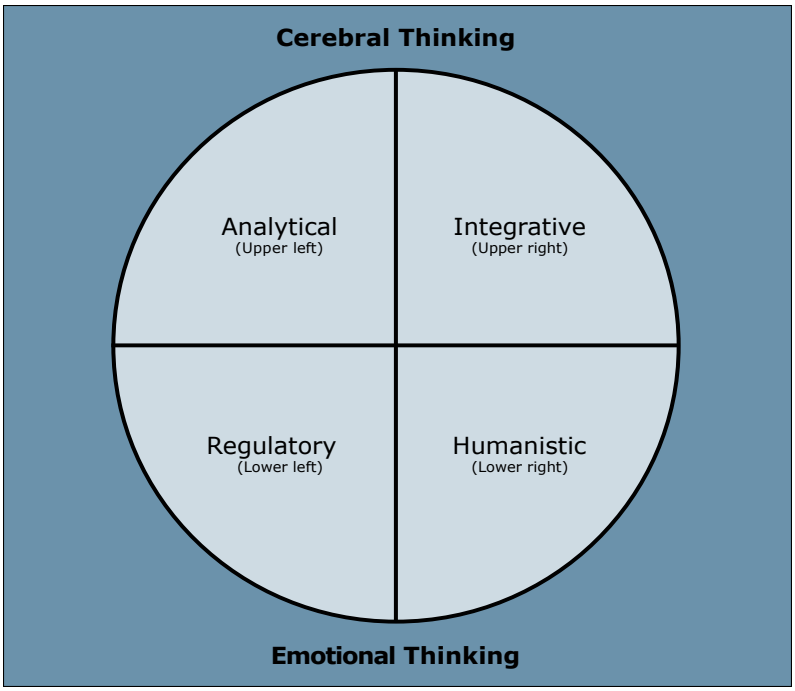


**Figure 9**—Ways of thinking: each person uses all four ways, but generally emphasizes one or two in decision-making (adapted from Herrmann 1996).

USDA Forest Service, Max Peterson (1984), recalled the diversity provisions of NFMA as arising simply from concerns about loss of flowering dogwoods from roadsides in Arkansas because of conversion of hardwood forest to conifers. This not only illustrates the importance of forest aesthetics to the public, but also the downside of an analytical, linear thinking style that is especially prominent in engineers and traditional economists (Carey 1997). This thinking style can be quite reductionistic. In this case, the major impetus for the NFMA seems to have been forgotten. The Monongahela clearcutting controversy resulted in litigation that halted timber harvesting on national forests, produced draft prescriptive legislation that would direct Forest Service management activities, and led to NFMA as an alternative to the prescriptive legislation. Another high-level career Forest Service employee recalled that NFMA was actually a combination of a House bill requiring diversity of tree species and a Senate bill requiring a diversity of plant and animal communities—protecting biological diversity as a means of ensuring that biological systems can respond to unanticipated changes as an insurance policy (MacCleery 1984a). Orie Loucks, an academician at the conference, traced the concern about diversity to the writings of Aldo Leopold and subsequent research by Simpson (1949), Preston (1948), Loucks (1970, 1984), Whittaker (1972), Terbogh (1974), and Pielou (1975).

An environmentalist recounted the history of diversity requirements in other legislation including the Multiple Use Sustained Yield Act, National Environmental Policy Act, Endangered Species Act, Sikes Act, and Resource Policy Act and in the Council on Environmental Quality 1980 report that warned of imminent large-scale species loss (Kirby 1984). Another academician traced the American history of land use changes wrought by people and the effects on diversity, including the mythology of pristine nature and the extinctions of Pleistocene fauna by people invading North America (Golley 1984). A third academician recounted a detailed historical account of events leading to NFMA citing the litigation Izaak Walton League vs. Butz that led to the Monongahela decision, the subsequent prescriptive legislation drafted by Senator Jennings Randolph of West Virginia, the wrangling in the House to produce a bill without a diversity provision, and, finally, the efforts of Senator Hubert Humphrey of Minnesota (Humphrey Bill, Senate Bill s3091) (Webb 1984). Yet a fourth academician described three origins for the concerns about diversity in NFMA (Cooper 1984): (1) Aldo Leopold's land ethic; (2) ecologists' concerns about the relationships between diversity, especially functional diversity, and system stability; and (3) the concerns of the conservation community

for rare and endangered species and community types. He left out the concerns about aesthetics and dogwood and the original impetus, the concern of West Virginia hunters about their favored game animals. A fifth academic ecologist expanded the concept to six aspects (Odum 1984): (1) diversity above and below the species level, genetic diversity, and functional diversity; (2) landscape-level diversity and concerns about monocultures; (3) diversity and stability, resistance, and resilience; (4) invisible diversity below ground; (5) diversity and the life support value of forests; and (6) diversity and urbanization. A Forest Service scientist raised similar concerns (Franklin 1984). Managers at the symposium searched for operational meanings and baselines (MacCleery 1984b; Salwasser et al. 1984a, 1984b). No one examined the social evolution of conservation concepts beyond those of the United States, the various cultural values centered on diversity, or the spiritual values that even ancient cultures found in natural diversity.

Individuals usually emphasize one or two of the four major cognitive preferences; very few people use all four equally. Thus, each person has a degree of self-limited access to information. The combination of cognitive preferences and subculturally (e.g., scientific vs. religious vs. agrarian) defined ways of knowing (fig. 10) leads to massively incomplete understanding of problems and their solutions. Interpersonal and intercultural differences can lead to failures in communication and cooperation, polarization, and litigation. Simon (1994) provides an example (see sidenote 14). Groupthink

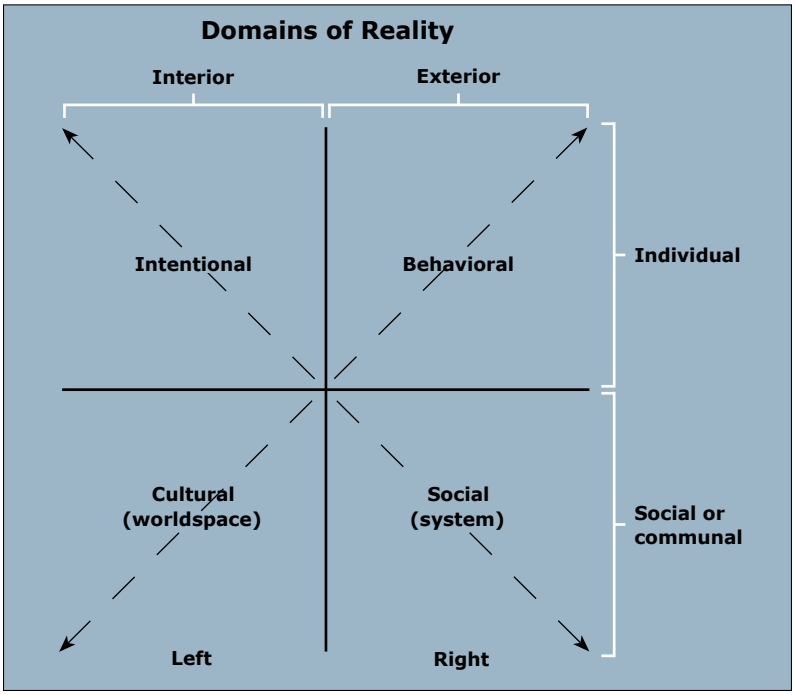


**Figure 10**—Domains of reality or different ways of knowing about the world: The right half of the quadrants can be seen and described in *It* language. However, the left half cannot be seen and must be described in *I* or *We* language. The left half must also be interpreted in the context of worldspace and intentions (adapted from Wilber 1995).

(Janis 1982) commonly arises in homogeneous groups and appears to have dominated the Forest Service through much of its history (Kennedy 1988). Cooper (1984) accurately prophesized: "Inevitably somebody is going to ask the Forest Service if it has done what the law requires ... So, despite the fact that forest managers do not want more direction, I think they are eventually going to have it."

Despite differing worldviews and different preferences for one or more of the various ways of thinking, a variety of conclusions emerged from the national diversity symposium (Cooley and Cooley 1984) and can be viewed, in my opinion, as currently still applicable (shown below in regular type) or as mistaken in the long run (italics):

- Providing for diversity is essential to maintain flexibility and options for the future.
- Research is needed to provide a stronger conceptual basis and expanded database for conservation.
- Baselines for diversity should be identified at national, regional, and local scales.
- *Diversity indices should be used as analytical tools, not to define diversity* (universally accepted definitions still elude us).
- *Diversity should be treated as an effect of management, not as an objective* (biodiversity is now a major objective).
- Certain guidelines (e.g., managing dead wood components) should be formalized.
- *The existing process adequately considers diversity in multiple-use planning* (plans and regulations are still being challenged and revised in efforts to address biodiversity).
- Information to provide for diversity should be integrated to provide a better database.
- Functional diversity, especially that of faunal communities associated with forest floors and soils, should be given greater attention.

Even so, the view of diversity as a relatively trivial concern about flowering dogwoods prevailed as agency policy as Cooper (1984) prophesized. The people first asked, then sued, and continued to provide stronger and stronger direction to an agency that did not want direction. A recent attempt to formulate a framework for national forest management (USDA Forest Service 2000) identified four key concepts: (1) sustainability as the overall goal in accordance with the Multiple Use Sustained Yield Act; (2) extensive cooperation, and collaboration with public and private entities; (3) integrating science

more effectively into the planning process; and (4) eliminating burdensome analytical requirements. This new planning rule affirmed ecological, social, and economic sustainability as the overall goal; maintenance and restoration of ecological sustainability as the first priority; greater public collaboration with expanded management choices, trust building, conflict management, and informed decisionmaking; a commitment to the viability of all species; regional assessments; and monitoring. However, this rule also attempted to codify one conservation philosophy, conservation biology, and has already been rejected. It may well be past the time when centralized rule making for natural resources management is acceptable to the public as a whole. The public has a "pervasive distrust of the agency" and is disillusioned because of the inadequacy and inappropriateness of previous planning and the resultant adversarial atmosphere with its extremist positions (Committee of Scientists 1999).

## Critical Theory and Green Political Thought

For the first time, we are faced with the collective responsibility for the consequences of our actions on a *global* scale. In this new millennium, loss of biodiversity has accelerated, global climate change is advancing, and social institutions are not attempting to develop an ecologically sustainable society. The social learning capacity of society must be used if we are to respond globally to ecological degradation. We must develop ecological norms and an ecological ethic that can work within a pluralistic, postmodern world, and we must accommodate a wide range of cultural viewpoints with their conflicting notions of what is profane and sacred, what is truth and heresy, and what it means to be human (Brulle 2002, Dryzek 1997). Is this hope utopian? How can we do this?

Brulle (2002) argues that critical theory can be used to good purpose here. Jürgen Habermas developed a Theory of Communicative Action. In previous historical eras, justification for ethics was based in metaphysics and spiritual belief systems that produced a philosophical definition of the good life. Modern society, however, has produced a pluralism of individual lifestyles and forms of life that collectively maintain a multiplicity of ideas of the good life and a breakdown of classical ethics. In other words, today there is no one uniquely privileged mode of life. Habermas's analysis of language suggests that norms of speech use define rational, universal moral principles, and, thus, might help identify these principles. Furthermore, communication creates and maintains social order;

thus, critical analysis of language can help us move toward a more civil society. Truth, normative adequacy, and sincerity enable communication and tie the individual's personal identity to the interaction. Thus, Habermas linked rationality, law, and constitutional democracy. Brulle (2002) quotes Habermas: "The only regulations and ways of acting that can claim legitimacy are those to which all who are possibly affected could assent as participants in rational discussions."

Legitimate expectations of reciprocal behavior in a modern, pluralistic society now take the form of rational law, and law can no longer be legitimated by metaphysical arguments. Legitimate law emerges only from the discursive opinion and will of equally enfranchised citizens. Citizens must see themselves as authors of the laws to which they are subject, and they must see public decisionmaking as a process of self-determination through open and rational discourse. Thus, even the normative content and structure of a representative democracy arise from the structure of linguistic communication. All citizens have basic individual rights: freedom of speech, equal protection under the law, and freedom of political association. All have basic sociological and ecological rights to the provision of living conditions.

Critical theory is a sociological inquiry that provides critical assessment of existing social institutions compared to standards of rationality; it is a procedure that does not determine what is a moral, ethical, good life or ethical standards for treatment of nature. Critical theory recognizes that there are many different forms of reasoning about the value of nature that inform multiple ethical arguments—there is no one universal argument for preservation of nature that will fit all cultures. For example, critical theory concludes that ecological rights are concerned solely with protecting aspects of nature strictly for human utilitarian purposes, but no more than this. Ecological ethics are a concern about what is a good life and outside critical theory. Democratic decisionmaking considers treatment of nature as a significant ethical concern because it is clear humanity and nature are interdependent and that the dependence of nature on our actions is evident. Ecology can provide information on impacts on the natural environment but holds no special competence in providing moral or aesthetic reasoning. There are limits to the use of science and biology in regard to human ethics. Furthermore, *without* fixed natural categories, fixed boundaries between nature and culture, fixed human nature, and fixed overall direction in the life process, it is impossible to make nature into a source of ethical and political prescriptions (but see Wilber 1995 below).

Big leaf maple. Photo by T. Wilson.

Critics say critical theory cannot adequately integrate concern for nonhuman nature because it only considers development of norms between humans. Robyn Eckersley provided a persuasive critique (Brulle 2002). Critical theory has benefits for human affairs—public participation enhances deliberations about preserving nature and community decisions should be democratic. But there are limits to its use—critical theory does not restructure ground rules of decision-making to provide any explicit recognition of nonhuman interests, it fails to justify preservation of species without utilitarian value, and its aesthetic values are selective and anthropocentric. Eckersley suggests that critical theory needs to develop a concept of nature as an end in itself, an expanded ethic that includes nonhuman needs, a science-informed moral line of argument, a recognition of the autopoietic intrinsic value theory that all organisms have self-directedness, and a principle for inscribing ecocentric norms into procedures of discourse as a matter of morality and justice (e.g., the precautionary principle).

Brulle (2002) rebuts the criticisms. All our knowledge of nature is socially constructed, and there is no authentic human representative of nature to speak for those nonhuman species. Seeing nature as a self-maintaining system is based on an application of systems ecology to construct a philosophy of nature that Brulle feels was robustly critiqued by evolutionary ecologists in the 1980s and 1990s (but see Gunderson and Holling 2002, Wilber 1995). Systems theory claims nature evolves through generation, diffusion, and selective retention of random mutations in a process of continual adaptation. Critics of systems ecology say nature is a chaotic system not self-regulating and thus one cannot use science to tell what a natural community or ecosystem is, never mind define what the essence of nature really is. Brulle (2002) states that the autopoietics of nature and the endowment of agency to nature is not a universal and objective idea grounded in ecologic science, rather it is a social construction of nature that suits a particular political aim; therefore, preserving nature means preserving a particular construct of what nature is supposed to be. Systems theorists (e.g., Wilber and Holling), however, have gone far beyond the arguments that Brulle rebuts to consider the physical Earth, nature, economic systems, and societies as parts of larger wholes. Indeed, Brulle states the artificial dichotomy between

humans and nonhuman nature is scientifically and historically inaccurate. He says: "Healing the rift between human beings and the natural world … is not a matter of joining what was once put asunder, but of getting the relations between human beings right first" (Brulle 2002). Thus, there is no necessary conflict between ecocentric norms and critical theory. However, Wilber (1995) insists on an even broader, decentered view—that of the holarchy (see below).

## The Role of Place in Conservation

A sense of place plays a fundamental role in the ways people conceptualize, practice, and disagree over conservation. Strong and direct connections exist between self-identity, place, and how individuals perceive and value the environment (Beckley 2003, Cheng et al. 2003, Mitchell et al. 1993). Places are the fundamental means by which we make sense of the world and through which we act. Social group identity and place are tied together and influence the group strategic behavior in natural resources politics. Thus, choice of geographic scale of place is a strategic key element of natural resources decisionmaking because conservation politics is as much a contest over place meanings as a competition among interest groups over scarce resources (Cheng et al. 2003), at least between local interest groups. Places invoke rich and powerful emotions and sentiments that influence how people perceive, experience, and value the environment; the feelings evoked are stored as "felts" and become integral parts of thought. Place-based stories recall and reinforce such felts and thoughts. The strong emotions and thoughts associated with places require even more attention on the part of professional managers than conflicts associated with competition for use of scarce resources; the interactions with the public quickly move into psychological and social contracting (Rousseau 1989), as opposed to legal contracts associated with competitive bidding for timber sales. Violation of a social contract is much more serious than cancellation of a business contract, and violation of psychological contracts can do irreparable harm to relationships (Levinson et al. 1962). Because places are not merely physical backdrops of human activity, but rather help people find order and meaning in the world, community-based collaborative partnerships are especially important in encouraging people of diverse backgrounds and opposing perspectives to work together to find common ground and common vision. Thus, a politics of place emphasizes place-based collaboration and problemsolving, whereas a politics of interest emphasizes legislative/agency/command-and-

control planning influenced by powerful coalitions. Cheng et al. (2003) offer these propositions:

- People's perceptions and evaluations of the environment are expressions of place-based identity and deeply personal connections with history and meaning.
- People perceive and evaluate the environment as different places rather than an assemblage of individual biophysical attributes.
- Social groups that seemingly emerge around using, protecting, or altering the physical attributes of a location may be engaging in more fundamental processes of assigning significant social and cultural meanings to that place.
- People's evaluations of, and responses to, conservation proposals are influenced by their identification with social groups organized around particular meanings of the places involved.
- Groups intentionally manipulate the meanings of places, hoping to influence the outcome of conservation controversies.
- The geographic scale of a place can change people's perceived group identification and, therefore, influence the outcomes of a natural resource controversy.

Attachment to place is based on the specific attributes of that place (e.g., community attachment, recreation-site attachment). Attachment influences public land management, regional economic development, and wilderness preservation (Beckley 2003). Rural residents' attachments to their communities include attachments to the geological, biophysical, and landscape attributes of their regional ecosystem. Attachments of visitors to rural areas include sociological (rural residents, cottage owners, recreationists) as well as the biophysical characteristics of the place. Thus, the human values in attachment to place have tremendous consequences for policy issues in that people make "irrational" decisions to stay in regions with failing economies (Simon 1994 provides a vivid example; see sidenote 14). Whereas some people are attracted to and attached in a positive sense to a community or landscape, others are stuck in place—attached in a negative sense, because they lack the social network, specialized ecological knowledge, or marketable labor skill to survive anywhere else. Attachments to place are complicated; top-down centralized decisionmaking is extremely problematic because it is direction from those who are unfamiliar and empirically uninformed, making application of generalized principles to the specific place—a recipe for unmitigated disaster (Beckley 2003). The sustainability of a community or place has much more to do with

people's attachment to it than with standardized indicators of social sustainability.

## Communities and Conservation

Community attachment implies an attachment to a defined geographic space, but there are also communities of interest (Beckley 2003). Communities of interest are bound by shared values or interests rather than shared space. Sociocultural attachments are interactions of length of residence (fig. 11), position in social structure, and stage in human life cycle. Attachments are stronger to more democratic and tranquil places than to repressive places with social strife; but beyond security concerns, attachment is a very complex phenomenon.

Human migrations are adding to the complexity of conservation policy (McCool and Kruger 2003). Rural areas in many parts of the Western United States had dramatic population growth in the late 20th century, fueled by environmental amenities, deteriorating urban conditions, and back-to-the-land movements. This growth stressed the capacity of rural communities. Amenity migrants often developed stronger attachments to place than long-time rural residents (McCool and Martin 1994). But at the same time, USDA Forest Service District Rangers and other agency high officials spent less time in rural communities and were relocated during downsizing and consolidations into larger communities distant from

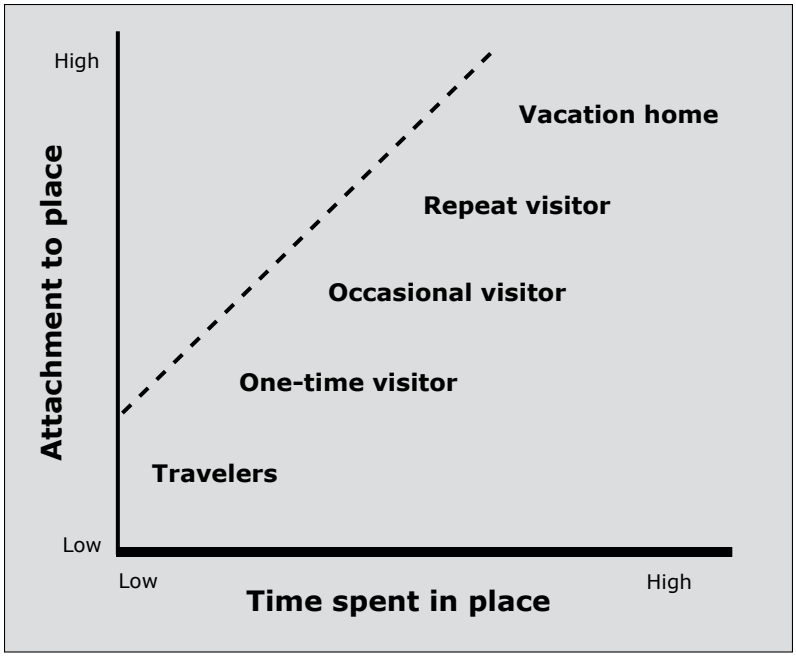


**Figure 11**—Time spent in place by different types of users (X-axis) may influence attachment to that place (Y-axis). Hypotheses about the time-attachment relationships made are (1) degree of attachment can be quantitatively measured; (2) degree of attachment varies with sociocultural factors, ecological factors, landforms, and cover types; (3) attachment changes with positive and negative changes in ecological and sociological factors; (4) degree and nature of attachment varies with size of unit of analysis; (5) attachment is a function of the length of time; (6) attachment is a function of cultural background; (7) attachment is a function of breadth and depth of knowledge; (8) attachment is a function of the nature of knowledge; and (9) degree of attachment reflects positive affective attachments (magnets) versus neutral or negative contexts (anchors) (adapted from Beckley 2003).

the forest (McCool and Kruger 2003). This restructuring seems to have reversed the processes of broadening discourses and changing mindsets of agency officials in response to increased public contact required by the National Environmental Policy Act (Carey 1997) and led to increased contact and conversations with agency peers and neighbors and community members not necessarily involved in conservation issues and matters of place. Migration raises other important considerations (McCool and Kruger 2003). For example, amenities are increasing in importance in rural areas and public lands offer environmental amenities. In addition, underrepresented, yet growing numbers of minority groups may have different wants and needs than earlier participants in conservation conflicts.

Communities are especially important in conservation because they are at the front line of stewardship and sustainability and represent collections of interests and concerns that are demanding more meaningful roles in conservation planning (Kruger 2003). Public acceptance is essential to every conservation decision made by a public agency (Shindler et al. 2002). The reasons social acceptance is important include (1) conservation decisions are rarely about applying objective science to a specific event; (2) citizens have a right of consultation about the conservation of public resources; (3) absence of public understanding and support makes it difficult to implement any decision in a democracy, especially when the public is pluralistic and highly differentiated (sidenote 15); and (4) social acceptance provides opportunities for discussion and change. Local communities of place and attached communities of interest are where the "rubber meets the road." Achieving social consensus requires public places to discuss and learn, opportunities for citizen participation, and trust building. Forums are needed for working through shared community values about fairness. Citizens do not trust conservation agencies—they doubt their sincerity and credibility, and they deeply distrust experts and institutions. To rebuild trust, citizen-organization interactions must be based on inclusiveness, sincere leadership, innovation and flexibility, early commitment and continuity of commitment, sound organizational and planning skills, and efforts that result in action (Shindler et al. 2002). A key is genuine dialogue. Interviews with people in Arkansas, California, Oregon, Colorado, Missouri, Montana, New Mexico, South Dakota, Tennessee, and Wyoming, despite generally cordial relationships between the USDA Forest Service and local communities, stressed the need for agency-community relationship building, funding and legal authority for relationship building, training in relationship building for Forest Service employees, and cultivation of intra- and interagency working

**Sidenote 15**—Shindler et al. (2002) asserted that (1) most people believe sustainable ecosystems are desirable; (2) many believe it is possible to supply forest products and maintain the integrity of the forest; (3) people expect managers to produce multiple benefits; (4) people know what they want (clean air and water, affordable wood products, decent jobs, recreation, scenic vistas), but managers frame choices poorly; and (5) people support a balanced, ecologically responsible approach to forest management.

relationships (Frentz et al. 2000). Collectively, these studies suggest an urgent need for the application of organization development theory and practice to conservation collaborative management, including sensitivity training, appreciative inquiry, conflict management, facilitating group dynamics, and a whole host of other well-developed methods for effecting change, bringing about transformation, and extracting creativity from conflict (French et al. 1994).

## Social and Personal Evolution

Developing a common vision means moving away from polarized, position-based thinking, adversarial and litigious processes, and win-lose or compromise solutions that leave major dissatisfactions unresolved. "What we need is a collective dream large enough to encompass and transcend all our small individual dreams in a way that gives them meaning and unity" (Maser 1994). Collaborative management requires an informed and supportive public. It requires institutions that value justice, equity, decentralized collaborative decisionmaking, and pragmatic problem solving (Wondolleck and Yaffee 2000). It requires scientists who are willing to engage humbly in collaborative learning and facilitate collaborative management

A mouse-eye view of the canopy in an old-growth forest on the Olympic Peninsula. Photo by T. Wilson.

by providing relevant theoretical, empirical, and pragmatic science. Collaborative management requires the purpose of consensus; willingness to reveal, listen, and understand; and stamina to do arduous work. Both knowledge and emotion are shared through communication (tone of voice, body language, and attitude). Every person has the right to simplicity and clarity in communication and an obligation to communicate simply and clearly (Maser et al. 1998). Yet, the ability to communicate simply and clearly is not always easy, and it requires hard work. Social sustainability—the civil society—requires individuals to undergo personal growth through a shift in consciousness from self-centeredness to other-centeredness (Maser et al. 1998) (sidenote 16), or as Wilber (1995) shows, decenteredness (see sidenote 14). Care and respect for each other is essential—"be gentle with one another, be gentle with nature, be humble" (Maser 1994). Collaborative management requires individuals to develop and actualize both their autonomy and their communality. In other words, individualism is good, bring it to the table, but set aside ego and strive for the common good. An aspect of communality important in collaborative management is a sense of community—a group of people with shared interests living under and exerting some influence over the same government in a particular locality and having a common attachment to that physical place and its social environment. A true community involves a sense of place, a history, and trust (Maser et al. 1998) (sidenote 17): "For one's community to be sustainable and our democracy to be lasting, we must individually and freely be willing to recognize and abide by the common good in our decisionmaking." However, there are communities of place and communities of interest that can be in competition. For example, the goals of the water-needy communities of interest in southern California conflicted greatly with the river-based communities of place in northern California. This is particularly true of federal lands where national, regional, and local interests abound. Both communities must be participants in the collaborative management process. An overarching framework is needed for progress in reconciling diverse views, values, and interests.

**Frameworks—**In a systems, holarchic view, there are three great realms of evolution: matter, life, and mind (Wilber 1995). Most of us are familiar with Darwinian evolution. Systems thinkers recognize evolution as the increasing differentiation, integration, structural organization, and complexity that offsets the Second Law of Thermodynamics, in other words, the forces that promote order versus those that lead to disorder. Theorists call this evolution the self-organizing

**Sidenote 16**—Maser et al. (1998) listed Erik Erikson's eight stages of human development:

- Trust vs. mistrust
- Autonomy vs. shame and doubt
- Initiative vs. guilt
- Industry vs. inferiority
- Identity vs. identity confusion
- Intimacy vs. isolation
- Generativity vs. stagnation
- Integrity vs. despair

**Sidenote 17**—Maser et al. (1998) said a resident community serves five purposes: (1) social participation that produces self worth, safety, and shared values; (2) mutual aid in time of individual and family need; (3) economic production, distribution, and consumption that provides jobs and commodities; (4) socialization, or educating people about cultural values and norms; (5) social control, the means for maintaining cultural values and norms. Resident communities can be damaged by vested local-internal interests and by outside interests (overharvesting by outsiders, corporate clearcutting, and temporary government employees).

system. To be part of a larger whole means that the whole supplies glue that holds the system together, glue not found in the isolated parts alone. Most of us are less familiar with the concepts of evolution of self and society. But many examples abound. For instance, in social systems, men seem to emphasize rights and justice in moral development as this social glue; women feel rights and justice must be supplemented with care and responsibility. It is easier to grasp social evolution than it is personal evolution within the greater social evolution. The following discussion recapitulates Ken Wilber's (1995) systems view of evolution as it applies to matter, life, *and the mind*. He describes the processes of evolution of self, society, and culture.

Wilber (1995) distinguishes between two types of hierarchies that occur within human systems. Domination hierarchies are repressive and pathological; actualization hierarchies are integrative and maximize system (cultural, societal, and personal) potential. The cure for a pathological hierarchy (e.g., a machine bureaucracy) is an actualization hierarchy (e.g., intentional collaborative management), not heterarchy (multiple use with uses in different places) that is just heaps of uses, not wholes of integrated uses. In a heterarchy each element contributes equally, but separately to the health of the whole within each level of the hierarchy. Heterarchies have differentiation (different uses) without integration. Holarchies, on the other hand, have differentiation with integration that brings a common and deeper purpose. Actualization involves a ranking, or subjective valuation, of increasing holistic capacity. Ranking is disturbing to believers in extreme equality and autonomy—they consider value ranking equivalent to oppression. Finding value in the world, however, is inherent in the human situation; qualitative distinctions are built into human orientation. Indeed, to deny value is in itself a value; denying ranking is in itself a ranking. Thus, contexts and frameworks produce values and meanings and may produce the sense that some actions, lifestyles, and ways of feeling are higher than others more readily available to us. *This provides us with informed choice*. Affirming life and freedom by repudiation of qualitative distinctions may be motivated by the strongest of moral ideas (freedom, altruism, universalism), but in reality is deep incoherence, self-illusion, concealing from oneself the sources of one's own judgments.

In understanding systems, it is useful to remember that matter, life, and mind are all part of the same holarchy of integrated whole/parts (*holons*). Holons display fundamental capacities in constant tension that create a novel holon with emergent properties—a wider, deeper whole. In other words, each holon, e.g., a person, seeks

to preserve his or her autonomy and rights (agency), counterbalancing autonomy with search for communion (participation, joining, and bonding). These are the Taoist principles of yin (communion) and yang (agency), rights vs. responsibilities, individuality vs. membership, personhood vs. community that are set against self-dissolution vs. self-transcendence. Dominance by any one of the tendencies is pathological. But it is key to recognize that each emergent holon transcends but nevertheless includes its predecessor; nothing is lost while much may be gained: *development is envelopment, not succession*. In nature, e.g., invasion of an abandoned agricultural field may set up a succession of biotic communities, one replacing another in a more or less predictable series. But development of a new Douglas-fir forest following catastrophic destruction of an old forest, with its attendant biological legacies, sets in process a series of stages of forest development (envelopment), each stage encompassing the preceding stage, increasing differentiation and integration. Each developmental level produces greater depth (number of levels) but has less span (number of *new* components in the new level) and is not necessarily correlated with size (spatial extent). The variety of shrews in the forest floor is far less than the variety of insects they consume or the variety of organisms and detritus the insects consume. However, destroy any holon and all the holons above it are destroyed, but none of the holons below it. Destroy a biotic community (shrews) and that particular ecosystem is gone; but the insects and their food (lower level ecological systems) remain. Destroy all humans and the biosphere still exists but the economies and societies disappear. Destroy the biosphere and humans disappear. Thus, holons with less depth (fewer levels) are more fundamental, but less significant. Holons coevolve. The holon of the individual is inseparable from the social holon, defined by its own particular form and pattern. Evolution of holons has directionality: increasing differentiation, variety, complexity, and organization. All autonomy is relative, but relative autonomy increases with evolution. In systems language, attractors in basins of attraction pull the system to a future endpoint (the omega point). In the terminology of Holling et al. (2002b), basins of attraction determine alternate stable states of ecosystems. It should be clear that systems theory easily envelops and integrates the polarized views and false dichotomies of earlier theories of organization and succession of biotic communities.

Many of our conservation issues are due to fractured worldviews; we lack a common vision. We need a vision that encompasses and transcends our individual visions. A beginning lies in a holistic view of a three-level world. Level 1 consists of physical

and physiochemical systems in the realm of matter; it forms the broad base of a pyramid. Level 2 holds the organizational levels of biological systems in the realm of life. Any level 2 holon embraces *its entire* level 1 world. Level 3 holds the organizational levels of sociocultural systems in the realm of society. The pyramid is narrower at the top (relative abundance decreases). Each holon within the pyramid depends on a whole series of intricate relational exchanges with the social environments of the same level of structural organization. The greater the depth of a holon, the more precarious its existence—fewer of them can be produced and maintained relative to the number of predecessors.

In the evolution of the mind, the human brain emerges from the genetic, metabolic, and neural biosphere. Paul MacLean (1985) described the brain as composed of three physical parts: a reptilian brain (the brain stem that provides autonomic and instinctive behavior), a paleomammalian brain (the limbic system that controls visceral and emotional reactions), and neomammalian brain (the neocortex that supports language and logic and the self-reflexive mind). In the emergent, nonphysical realm of the mind, size (spatial extent) gives way to *intention*. The social environments of the human are family, village, town, city, and state. There is no compelling biological reason (reproduction of bodies) for organization at the village level and above, but these higher organizations provide the symbols and tools necessary for reproduction of culture through symbolic communication. Thus, with evolution, kinship gave way to cultureship as the brain remained unchanged for 50,000 years and cultural development proceeded from the mind.

Of course, with greater structural complexity, more things can go horribly wrong. Atoms do not get cancer, but animal tissues do. Evolution producing greater transcendence and greater differentiation can go too far and fail to adequately integrate the emergent differences into a coherent whole. Some theorists postulate that most of humankind's problems came with the invention of farming. People began to alter the biosphere for their own gratification, created a written language that ensconced power in dogmatic text, and produced agricultural surpluses that led to economic control, slavery, and the subjugation of women. These theorists idealize the hunter-gatherer society; but that society was rarely egalitarian and often warlike. Wilber (1995) labels this kind of thinking as the "way-back machine looking for the Garden of Eden"—a thought process highly related to managing for the range in natural variation from some preagricultural period and mimicking stochastic disturbance processes. The problem was not the development of agriculture but the

lack of integration and the development of dominator hierarchies in the evolution of agrarian societies.

Coincident with the external process of social evolution is the interiority of the evolution of the mind—from irritability to sensation, perception, impulse, image, symbol, and concept. The *within* of things relates to consciousness, cognition, perception, and spontaneity. Karl Popper refers to the "making and matching" of new epistemological domains. Jürgen Habermas, in his studies of communication and the evolution of society, developed a Theory of Communicative Action with epochs of human evolution based on worldviews: archaic, magic, mythic, and mental (Brulle 2002). Thus, shared values constitute the exterior culture and worldview constitutes the interior of the social system. A shared cultural worldspace must be interpreted: What does it mean versus what does it do? Wilber (1995) gives the example of a Hopi rain dance as expressing a sacred connection with nature and a request (meaning) and producing social solidarity and cohesion (function). Meanings provide understanding; functions provide explanations.

Subtle reductionism reveals four dimensions of interpretation (see fig. 10)—intentional, behavioral, cultural, and social developments—not the single dimension of materialistic and mechanistic function of gross reductionists. The interior is dialogical, dialectical, and empathetic with major issues related to meaning, interpretation, and sincerity (truthfulness). The external deals with propositional and empirical validity criteria that determine truth (Wilber 1995). Thus, thoughts have meanings to individuals that are sustained by a network of exterior norms and linguistic structures existing in a shared culture. In other words, a shared worldspace is necessary for communication of meaning among individuals. This raises the question of cultural fit of individual meanings and values with the culture that helps produce them. Background and culture allow individuals to form meaning, and relational exchange allows communication between people. Thus in the lower left quadrant (cultural worldspace), validity criteria are truth, truthfulness, and mutual understanding; in the lower right quadrant (social system), the criteria for validity relate to functional fit—what does it do? All this exists within a holarchy of value, beauty, meaning, motivation, understanding, intention, and consciousness. Using reductionism to suborn the interior (lower left) to the exterior (lower right) fragments worldviews and reduces individuals to role and function. However, the four quadrants can be usefully collapsed into three: the right two composing Karl Popper's objective world of *It*, the upper left, the subjective world of *I*, and the lower left, the cultural world of *We*.

Jürgen Habermas then postulates the three validity claims of truth (*It*, objects), truthfulness-sincerity (*I*, subjects), and rightness-justice (*We*, intersubjectivity). Plato similarly identified true (objective, propositional truth), beautiful (the individual aesthetic), and good (cultural appropriateness and justice). Kant's critiques are pure reason (*It*), personal aesthetic judgment (*I*), and practical reason (*We*). And, finally, the three jewels of Buddha: Dharma (*It*), Buddha (*I*), and Sangha (*We*). The key here, in terms of conservation, is that *we cannot escape these three worlds*—the objective (*It*), the subjective (*I*), and the social (*We*)—and their different claims to truth—propositional truth, normative rightness, and subjective truthfulness. Each can be exposed to evidence and checked for actual validity in collaborative learning environments. These are the three fundamental functions of language—Intentionality (*It*), Truth (*I*), and Rightness (*We*). Each can be exposed to evidence and checked for actual validity in collaborative learning environments. These functions form the basis for active, intentional management (AIM) and the use of intentionality in evaluating conservation plans (Carey et al. 1999c). Wilber (1995) concluded that before we can attempt an ecological healing, we must reach an individual understanding and mutual agreement on the best way to collectively proceed.

Colorful birds, such as this male rufous hummingbird, spark interest in wildlife and help connect people to nature. Photo by A. Wilson.

**Human nature—**Evolution of the three-part brain allowed the evolution of symbols and concepts in the mind and the evolution of the family group and tribe. Reconciling the differentiation of social labor (e.g., hunting) and nurturance of young produced the "familization" of the male, the single enduring task of all subsequent civilization. Although, Gilmore (1990) suggests that familization is but one part of a much more complex social phenomenon. Nevertheless, early female horticulturalists produced 80 percent of the food and shared considerable public power with men. With development of the plow and an agrarian society, males produced the bulk of the food and dominated the public sphere; even reigning deities switched from a Great Mother to a Great Father focus. Thus, sex-based differentiation resulted in dissociation that produced an extreme sexual polarization. It would be some time before a new integration of men and women could be conceived in an utterly new world-space. Michel Foucault observed that people, when discontent with the present, seek some cheap archaism—an imagined form of past happiness (e.g., the early-agrarian

Eden preceding the European settlement of North America)—devoid of dangers and inequalities (Wilber 1995).

In the battle of worldviews, each stage of development transcends and includes, negates, and preserves its predecessors. So the major structures of all the worldviews—magic, animism, mythology, rationality, vision-logic—may exist together, or in part in various degrees of integration, in any one individual, any group, or even side by side, unintegrated, in society. The first major development with familization of men and conventional kinship relationships was a magical-animistic culture within which people used preoperational thinking that works with images, symbols, and concepts, but not complex values and formal operational thinking. Thinking emphasized representations of sensory objects in the external world, close to the body. Morally, people exhibited physical pragmatism and a naïve instrumental hedonism. Norms were expressed in terms of good vs. bad, right vs. wrong and interpreted as punishment, reward, and exchange of favor. This culture is described as magical because there was little differentiation between the mind and body, and mental images and symbols could be confused with physical events; mental intentions were believed to be capable of altering the physical world. This culture was animistic because physical objects were considered to be alive and to possess intentions of their own. Collective identity was with a common ancestor and personal identity was with a particular tribe (Wilber 1995).

The next development was the mythological culture—societies organized through a state that required a more abstract identity and an expansion of the world of gods. Mythology was enveloped in turn by the mythic-rational culture, which incorporated the purposive rationality of scientific and technical knowledge, the formal rationality of mathematics, and the interpersonal-practical rationality of morality and communication. The rationality added was formal operational cognition—thinking about thinking, reflecting on one's own thought processes, transcending them, and taking a perspective different from one's own, entertaining hypothetical possibilities, being highly introspective, and justifying thoughts and actions by reviewing reasons and evidence for one's beliefs.

Empires produced modern states that formally recognized each other, the separation of church and state, the emergence of a global market economy, and the rise of rational culture. Egoic-rational thinking began more than 2,000 years ago, but reached fruition in 16$^{th}$-century Europe. Socrates said know thyself, look within; Cicero echoed "Cognosce te ipsum," and later philosophers asked what is there to know and how can I know it? Religions did likewise—Jesus

said the kingdom of heaven is within, and Buddha said penetrate yourself. These were radically new thoughts and marked a conceptual change from individuals as the roles they play in society to individuals as free subjects. Socially this was translated into (a) free and equal subjects under the law, (b) morally free subjects, and (c) politically free subjects (callouts 2, 3).

New integration brought women to the fore as public and historical agents. This integration, of course, allows both liberal and radical feminism as well as women's special rootedness in the biosphere:

> … A million years of rich tradition of the wise woman who feels the currents of embodiment in nature and communion and celebrates it with healing rituals and knowing ways of connecting wisdom that does not worship merely the agentic sun and its glaring brightness but finds in the depths and organic dark the ways of being linked in relationship, that puts care above power and nurturance above self-righteousness, that reweaves the fragments with concern, and midwifes communion and the unsung connections that sustain us each and all. And finds, above all, that being self is always being a self-in-relationship (Wilber 1995).

It bears repeating, that each development envelops and maintains preceding developments; the use of animism, magic, and mythology as "as ifs," not literally, can be transcendental—the real function of mythology. In other words, a properly interpreted myth can help us get in touch with our roots and our foundations, including the archaeological layers that lead to our present awareness. We can gain new perspectives from the interpreted mythologies of ethnic groups other than our own, be they African, European, Asian, or Native American. They can become empowering, enriching, and energizing because they touch archetypal structures while simultaneously robbing them of their worldview. For example, The Men's Movement, led by Robert Bly, played out myths in an "as if" fashion, transcending them with rationality. Camille Paglia (1990), in her groundbreaking monograph, traces the evolution of the female persona in art over the ages and women's historical and new public agency. Finally, Paul Ray (1996) documents the contemporary leadership of women in the emerging, integrative, transformational subculture that holds community and sustainability as primary values. Genuine spirituality is the primary measure of depth in worldviews. The depth of reason is the capacity for universal pluralism, insistence

on universal tolerance, grasp of global-planetary perspectivism, insistence on universal benevolence and compassion—a genuine spirituality.

The majority in rational societies tend to settle in mythic-rational (including religious-rational and dogmatic-rational) worldviews, using the power of rationality to prop up a particular divisive, imperialistic mythology and an aggressively fundamental program of systematic intolerance. Thus originates much of the contemporary public discourse in the United States. A modern solution to these deharmonizing discourses is the democratic state with its all-important separation of church and state that removes the worldviews of the would-be pathological dominator holons from the organizing regime of society that is defined by a rational tolerance of *everything but intolerance*. This robs the mythic holons of their power to govern exclusively and to push their mythic-imperialistic expansionism via military means—but it does not always prevent them from agitating to tilt the state toward their own fundamentalist values as has happened so successfully in recent years. Where myths govern, military expansion is the rule (Wilber 1995).

***Reason is the stuff of collaborative learning and collaborative management.***

The rationality of a universal, noncoercive outlook produces a vision-logic, a system of seeking truth, the relations of idea within idea and truth within truth, all seen in the integral whole. Vision-logic can hold contradictions in the mind; unify opposites; and weave together what otherwise appears to be incompatible notions, negated in their partiality but preserved in their positive contributions. This is *Reason*, and it is the stuff of collaborative learning and collaborative management. The worldspace of vision-logic is existential. Vision-logic has integrative power, which requires an a-perspectival mind (open to all truths) vs. a rational-perspectival mind; in other words, no single perspective is privileged. Vision-logic produced the international labor movement—the only global social movement in history. The strength of that movement was its commitment; the weakness was its lack of spirituality. The green culture (see also Ray 1996) similarly is potentially powerful but makes a similar mistake of reductionism. Its two central notions are (1) the sphere of the mind is part of the biosphere and (2) the web-of-life systems theory; they are, Wilber says, in the first, wrong, and the second, subtly reductionistic. A more integrative approach is needed; Wilber calls it Planetary Transformation. Gunderson and Holling (2002) offer the Panarchy theory. Global transformation is necessary to protect the global commons, regulate the worldwide financial system, and maintain a modicum of international peace and security.

*(continued on page 94 )*

**Callout 2**—*The Declaration of Independence*


IN CONGRESS. JULY 4. 1776.

The unanimous Declaration of the thirteen States of America.

In CONGRESS, July 4, 1776
The unanimous Declaration of the thirteen united States of America,

When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness. —That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, —That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and Happiness. Prudence, indeed, will dictate that Governments long established should not be changed for light and transient causes; and accordingly all experience hath shewn, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed. But when a long train of abuses and usurpations, pursuing invariably the same Object evinces a design to reduce them under absolute Despotism, it is their right, it is their duty, to throw off such Government, and to provide new Guards for their future security. —Such has been the patient sufferance of these Colonies; and such is now the necessity which constrains them to alter their former Systems of Government. The history of the present King of Great Britain [George III] is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute Tyranny over these States. To prove this, let Facts be submitted to a candid world.

He has refused his Assent to Laws, the most wholesome and necessary for the public good.

He has forbidden his Governors to pass Laws of immediate and pressing importance, unless suspended in their operation till his Assent should be obtained; and when so suspended, he has utterly neglected to attend to them.

He has refused to pass other Laws for the accommodation of large districts of people, unless those people would relinquish the right of Representation in the Legislature, a right inestimable to them and formidable to tyrants only.

He has called together legislative bodies at places unusual, uncomfortable, and distant from the depository of their public Records, for the sole purpose of fatiguing them into compliance with his measures.

He has dissolved Representative Houses repeatedly, for opposing with manly firmness his invasions on the rights of the people.

He has refused for a long time, after such dissolutions, to cause others to be elected; whereby the Legislative powers, incapable of Annihilation, have returned to the People at large for their exercise; the State remaining in the mean time exposed to all the dangers of invasion from without, and convulsions within.

He has endeavoured to prevent the population of these States; for that purpose obstructing the Laws for Naturalization of Foreigners; refusing to pass others to encourage their migrations hither, and raising the conditions of new Appropriations of Lands.

He has obstructed the Administration of Justice, by refusing his Assent to Laws for establishing Judiciary powers.

He has made Judges dependent on his Will alone, for the tenure of their offices, and the amount and payment of their salaries.

He has erected a multitude of New Offices, and sent hither swarms of Officers to harass our people, and eat out their substance.

He has kept among us, in times of peace, Standing Armies without the consent of our legislatures.

He has affected to render the Military independent of and superior to the Civil power.

He has combined with others to subject us to a jurisdiction foreign to our constitution and unacknowledged by our laws; giving his Assent to their Acts of pretended Legislation:

For Quartering large bodies of armed troops among us:

For protecting them, by a mock Trial, from punishment for any Murders which they should commit on the Inhabitants of these States:

For cutting off our Trade with all parts of the world:

For imposing Taxes on us without our Consent:

For depriving us, in many cases, of the benefits of Trial by Jury:

For transporting us beyond Seas to be tried for pretended offences:

For abolishing the free System of English Laws in a neighbouring Province, establishing therein an Arbitrary government, and enlarging its Boundaries so as to render it at once an example and fit instrument for introducing the same absolute rule into these Colonies:

For taking away our Charters, abolishing our most valuable Laws, and altering fundamentally the Forms of our Governments:

For suspending our own Legislatures, and declaring themselves invested with power to legislate for us in all cases whatsoever.

He has abdicated Government here, by declaring us out of his Protection and waging War against us.

He has plundered our seas, ravaged our Coasts, burnt our towns, and destroyed the lives of our people.

He is at this time transporting large Armies of foreign Mercenaries to compleat the works of death, desolation and tyranny, already begun with circumstances of Cruelty and perfidy scarcely paralleled in the most barbarous ages, and totally unworthy the Head of a civilized nation.

He has constrained our fellow Citizens taken Captive on the high Seas to bear Arms against their Country, to become the executioners of their friends and Brethren, or to fall themselves by their Hands.

He has excited domestic insurrections amongst us, and has endeavoured to bring on the inhabitants of our frontiers, the merciless Indian Savages, whose known rule of warfare, is an undistinguished destruction of all ages, sexes and conditions.

In every stage of these Oppressions We have Petitioned for Redress in the most humble terms: Our repeated Petitions have been answered only by repeated injury. A Prince whose character is thus marked by every act which may define a Tyrant, is unfit to be the ruler of a free people.

Nor have We been wanting in attentions to our British brethren. We have warned them from time to time of attempts by their legislature to extend an unwarrantable jurisdiction over us. We have reminded them of the circumstances of our emigration and settlement here. We have appealed to their native justice and magnanimity, and we have conjured them by the ties of our common kindred to disavow these usurpations, which, would inevitably interrupt our connections and correspondence. They too have been deaf to the voice of justice and of consanguinity. We must, therefore, acquiesce in the necessity, which denounces our Separation, and hold them, as we hold the rest of mankind, Enemies in War, in Peace Friends.

We, therefore, the Representatives of the united States of America, in General Congress, Assembled, appealing to the Supreme Judge of the world for the rectitude of our intentions, do, in the Name, and by the Authority of the good People of these Colonies, solemnly publish and declare, That these United Colonies are, and of Right ought to be Free and Independent States; that they are Absolved from all Allegiance to the British Crown, and that all political connection between them and the State of Great Britain, is and ought to be totally dissolved; and that as Free and Independent States, they have full Power to levy War, conclude Peace, contract Alliances, establish Commerce, and to do all other Acts and Things which Independent States may of right do. And for the support of this Declaration, with a firm reliance on the protection of divine Providence, we mutually pledge to each other our Lives, our Fortunes and our sacred Honor.

**Callout 3**—*The Bill of Rights*


Congress of the United States
begun and held at the City of New-York, on Wednesday the fourth of March, one thousand seven hundred and eighty nine.

THE Conventions of a number of the States, having at the time of their adopting the Constitution, expressed a desire, in order to prevent misconstruction or abuse of its powers, that further declaratory and restrictive clauses should be added: And as extending the ground of public confidence in the Government, will best ensure the beneficent ends of its institution.

RESOLVED by the Senate and House of Representatives of the United States of America, in Congress assembled, two thirds of both Houses concurring, that the following Articles be proposed to the Legislatures of the several States, as amendments to the Constitution of the United States, all, or any of which Articles, when ratified by three fourths of the said Legislatures, to be valid to all intents and purposes, as part of the said Constitution; viz.

ARTICLES in addition to, and Amendment of the Constitution of the United States of America, proposed by Congress, and ratified by the Legislatures of the several States, pursuant to the fifth Article of the original Constitution.

Article I—After the first enumeration required by the first article of the Constitution, there shall be one representative for every thirty thousand, until the number shall amount to one hundred, after which the proportion shall be so regulated by Congress, that there shall be not less than one hundred representatives, nor less than one representative for every forty thousand persons, until the number of representatives shall amount to two hundred; after which the proportion shall be so regulated by Congress, that there shall be not less than two hundred representatives, nor more than one representative for every fifty thousand persons.

Article II—No law varying the compensation for the services of the Senators and Representatives, shall take effect, until an election of Representatives shall have intervened.

Article III—Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

Article IV—A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed.

Article V—No Soldier shall, in time of peace be quartered in any house, without the consent of the Owner, nor in time of war, but in a manner to be prescribed by law.

Article VI—The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Article VII—No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

Article VIII—In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial

jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the Assistance of Counsel for his defence.

Article IX—In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.

Article X—Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

Article XI—The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

Article XII—The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

**Sidenote 18**—Moral Development (Wilber 1995):
- **Preconventional**—egocentric, geocentric, biocentric, narcissistic, body bound
- **Conventional**—sociocentric, ethnocentric, culture-bound
- **Postconventional**—worldcentric, universal pluralism, asks "Who am I?" for the first time, reflexive and introspective, hypothetico-deductive, relies on evidence to settle issues

*(continued from page 89)*

**Individual development—**Jean Piaget reviewed the development of the individual mind and its parallels to the development of social systems. These parallels by age class include 0 to 2—sensorimotor (archaic, archaic-magic); 2 to 7—preoperational (egocentrism, perspectivism, realism, and reciprocity); 7 to 11—concrete operational thinking; and age 11+—formal operational thinking.

The first imaginary images appear to the mind at 7 months. A child regards his or her own point of view as absolute and then discovers the possibilities of other points of view. Reality is that which is common to all points of view taken together. At 18 months, a child learns to differentiate his or her own feelings from the feelings of others. At 3 years, a child becomes a coherent and stable self, able to use language. Symbols are used, the first being the word "No!" Concepts are grasped, but magic still dominates the 2 to 4-year-olds. Even at 4 to 7 years, children retain some belief that an individual can magically alter an object, but they recognize that their thoughts do not control the world. Thus, "magic," says Wilber (1995), "is transferred to Daddy, God, or some volcano spirit." Rituals and prayers are added to move from magic to magic-mythic.

Carl Jung believed that all the forms and motifs of the world's great mythologies are collectively inherited in the individual psyche of each of us—and Freud and Piaget agreed. Thus mythic membership produces an intensively cohesive social order. In the concrete operational stage, the child begins to enter the world of other minds and can take the role of others, but still is egocentric, sociocentric, and anthropocentric—centered on a role identity in a society of other roles. But the child can grasp the nature of a holon of whole/parts, value hierarchies, and continua of preferences vs. the either-or. With formal operational thinking comes the transformation from role identity to ego identity, from sociocentric to worldcentric—the capacity to distance oneself from egocentric and ethnocentric embeddedness and consider what would be fair to all people, not merely one's own. Freedom from embeddedness in bodily impulses and assigned social roles produces the fully separated, individuated sense of self. Mythic membership gives way. A new world of feelings, dreams, passions, and idealism can develop. This is the first truly ecological mode of awareness—the child can grasp mutual interrelationships, take different perspectives, and coordinate systems. Formal operational thinking allows the child to understand justice, mercy, compassion, reciprocity, equality, conscience, rights, and responsibilities (sidenote 18). Emergence of rationality, however, can produce a massive loss of cultural meaning and social integration

and the need for new integration at the global level.

Reason has its own inherent problems and limitations, but Wilber says that is no cause to "board the Regress Express and set the Way Back Machine to medieval or horticultural or foraging" or pre-European settlement conditions. Rather, transpersonal development is called for—increasing interiorization and decreasing narcissism. One is no longer merely buffeted by immediate fluctuations in the environment and relative autonomy—the capacity to stay inwardly focused—increases individuation. This produces internalized action or the capacity to internally plan an action and anticipate its course rather than being merely an automaton. This vision-logic is the stage beyond formal operational thinking; it is dialectical, integrative, creative, synthetic, and integral a-perspectival. Formal operational thinking is simple problem solving; vision-logic produces creative scientists and thinkers. Ecology and relational awareness emerges with formal operational thinking but comes to fruition with vision-logic. Vision-logic integrates the well-differentiated matter, body, and mind. Vision-logic sounds good, but it is not the omega point of personal evolution; it has its downside, primarily dread, the existential malaise. The cure for this angst is transcendence. The transpersonal domain starts with reason, with truth established by evidence (results of experimental methods), and produces claims of higher awareness that embraces love, identity, reality, self, and truth (Wilber 1995).

***The transpersonal domain starts with reason, with truth established by evidence, and produces claims of higher awareness that embraces love, identity, reality, self, and truth.***

Wilber (1995) says the single greatest task facing modernity and postmodernity is integrating the person, culture, and nature—integrating the interior subjective worlds of *I* and *We* with the exterior objective *Ego* (as worldcentric stance of universal pluralism, altruism, benevolence, and freedom) and the *Eco* (the biosphere). The whole point of rationality and its capacity for multiple perspectives is to put oneself in the shoes of others and find a mutual enrichment and appreciation of difference, a celebration of diversity. Another urgent task of postmodernity (the here and now) is the development and establishment of genuine environmental values—a moral and ethical stance toward nonhuman holons. One of the most obvious difficulties is the biocentrism of the eco-camp with all life forces having equal value and equal worth. Wilber (1995) offers a holarchic alternative:

- All things and events are perfect manifestations of spirit, thus all holons have equal and ultimate value or equal ground-value.
- All holons are whole/parts, and thus have whole-value and intrinsic value (value in and of itself). There are levels of significance,

too—the greater the depth of holons, the more significant for the Kosmos; all have rights to exist, otherwise the whole dissolves.

- As parts, all holons have instrumental values (extrinsic value); the more "partness-value" (the greater the whole of which the holon is part), the more fundamental for the Kosmos.

In other words, it is much better to kill a carrot than a cow even though they are both perfect manifestations of the spirit with equal ground-value, but the cow has more depth (and consciousness).

## Agencies, Organizations, and Society

It seems inescapable that public conservation agencies must evolve, develop, and become more democratic, informative, and facilitative to be of use in the 21st century (Danter et al. 2000). Impediments to organization change are various and formidable, internal and external (Bull 1994, French et al. 1994). Most conservation agencies are top-down, command-and-control, hierarchical bureaucracies with centralized techno-structures derived from the early industrial age and excessively inflexible. They are kept that way by internal power structures and external controls of laws, regulations, codified processes, and litigation and lobbying. Internal transformation is challenging enough—to change the policies and culture of a government agency is a complex endeavor. The former Lands Commissioner for the State of Washington offers the following advice (Belcher 2001): Be sure you want the job. Much of this book has been about the need for transformation and transcendence. Transformation does not occur without significant effort and without outside intervention. If we, as a society are to progress toward more effective, more democratic, more collaborative, more local forms of conservation, all the stakeholders—agencies, private and nonprofit organizations, and individuals—must undergo positive, purposeful change.

What is our purpose? What are we about? There seems to be an emerging consensus for conservation; common themes are arising across the globe. For most of us, attachment to family, community, and place helps define us. We wish to form a civil society that strives for attainment of human happiness and achievement of human potential, provides for social justice and equity for the present and future generations, and preserves the capacity of the all-important *land* that is our home, sustenance, and future opportunity.

We cannot leave it to others to preserve our land, our

communities, or our sense of well-being. We must do it ourselves, from the bottom up. Our society suffers from the yoke of the top-down. We must "think globally and act locally."

Those who are attached to place emotionally, culturally, economically, and spiritually, must be the ones to discover the path to harmony in the shared ownership of the land. We must learn together and jointly make decisions about how to conserve the land and nature.

## Science, Scientists, and Society

In the postmodern world, science and scientists have come under increasing criticism because of their ways of thinking and of participating in the greater society. Maser (1994) listed five roadblocks to legitimate scientific acquisition of new knowledge: lure of grants

Regine Carey leans against a giant yellow cedar. Photo by A. Carey.

(and legislatively appropriated research funds) aimed at predetermined results; attachment to a single hypothesis; scientific methodology that can only reject or fail to reject hypotheses (no formal mechanism for proof); science used to safeguard established dogma; science in denial of human participation in nature. It is obvious that the processes of distributing funds for conservation science (from legislatures through funding agencies and organizations) are driven by a combination of external forces of present and emerging crises and public demand and the political philosophies, prevailing science dogma, and environmental philosophies of those involved in the distribution processes. Funding for conservation science does not necessarily follow any rational, critical examination of gaps in knowledge, and this should be made clear to users of science. Other ways in which scientists and other people involved in conservation think and behave also may squelch development of consensus (Maser et al. 1998):

- Scientists without a spiritual foundation, in a sea of arrogance and increasing intellectual isolation.
- Continuing narrow specialization that produces fragmented worldviews.
- People pointing outside of themselves to the causes of environmental problems.
- Asking science to answer questions about social ideas.
- Ostracizing those with the courage to question the acceptance of normal scientific inquiry.

The scientific community acknowledges many of these, and other, concerns; e.g., focus on contemporary research erases historical contributions of science and leads to science recycling (Graham and Dayton 2002). Still, successful collaborative management requires a base of science information (Wondolleck and Yaffee 2000). Collaborative management must deal with complexity, uncertainty, and change; it must integrate across space and time. Collaborative management must build understanding among stakeholders, coordinate across boundaries, make effective decisions, and develop the capacity to deal with future challenges. It cannot do any of these without good science and technical support. People making decisions about conservation often need quantitative, or at least qualitative, estimates of ecological values. Placing values on the environment depends on the skill and is influenced by the culture of the researcher (Pizzolotto 1994). Value concepts can be influenced by both scientific and social factors, which may be in conflict. Criteria such as naturalness

and rarity are almost never referenced to an objective zero value. In most cases, evaluation is done by criteria that distinguish between natural (undisturbed) and highly degraded conditions. Natural is relative (everything is natural) and the idea that man takes part in this naturalness seems largely accepted, especially in Europe with a long history of a natural-cultural mosaic (see fig. 2c).

## Social Sciences

Christensen and Donoghue (2001) suggested a research framework for conservation in the Pacific Northwest that recognized that (1) social values are unknown for rural people, communities, and development; (2) traditional concepts of rurality do not reflect today's rural places and people; (3) collaborative management—collaborative stewardship for ecosystem management—is largely undeveloped; and (4) socioeconomic change in rural communities is poorly understood. They quote Gifford Pinchot, the founder of the U.S. Forest Service: "It is the duty of the Forest Service to see to it that … every … resource of the forest is used for the benefit of the people … in the neighborhood … ."

Research on social aspects of conservation has been growing and gaining focus as communities demand more active, meaningful roles in conservation planning (Kruger 2003). Studies of community-forest relations now use a variety of approaches—conventional objective methods, collaborative inquiry, and rapid rural appraisals by using open-ended surveys and focus groups. All the methods are subject to criticism, but what is most lacking is clear definition of purpose—for whose interest, to what end (Sturtevant 2003)? Dialogue, active listening, and triangulation using different sources of data and methods allow analyses that can contradict, complement, and confirm existing knowledge of the community; what is more difficult to address is that some communities lack even the social and human capital to participate; inequality, disaffection, and quiescence may impede participation (see also Carr and Halvorsen 2001) (sidenote 19). Citizen juries offer unique and novel opportunities to engage the public in conservation values (Ward 1999). A small, but socially representative group is provided with time and information to conduct a democratic deliberation about what it is worth to pursue conservation when there is no market value to establish prices. These participants (or their employers) can be financially compensated for the large investment of time required. Some advantages relative to other methods of inquiry are that the participants can

**Sidenote 19**—Common beliefs that underlie feelings about public forest management activities in Michigan with relative importance to influencing management indicated by percent value (adjusted $r^2$) (Carr and Halvorsen 2001):

**Community/forest linkages:**
- Forests are as much a part of a community as streets and buildings: 8 percent
- Forest lands are a community to which humans belong: 6 percent

**Forests as ecological systems:**
- Forests should be managed like an agricultural crop: 26 percent
- Managing forests for any purpose upsets nature's balance: 25 percent
- Forests are such complex ecosystems they cannot be managed at all: 18 percent

**Making management decisions:**
- Citizens working together can make the best decisions about how to manage public forests: 9 percent
- How forests are managed is the responsibility of the professional forester: 6 percent

**Values that should be protected:**
- Forests should be managed to protect their ecological value: 21 percent
- Forests should be managed to protect their recreation value: 17 percent
- Forests should be managed to protect their economic value: 17 percent
- Forests should be managed to protect their spiritual value: 15 percent
- Forests should be managed to protect their commodity value: 13 percent

engage in collaborative learning and become well informed; the deliberative process can become more democratic and legitimate; social dimensions are more likely to be captured; and distributional issues are likely to be addressed more directly. Potential problems include poor representativeness, bandwaggoning, stentorian opinion leadership, tight definition of the agenda by sponsors, providing partial or selected information, and juror preconceptions.

Studies of populations restructuring following immigration and the implications for conservation, economics, and the cultural dimensions of social life are emerging (Nelson 2002, Overdevest 2000). Participatory action research includes a variety of methods but emphasizes education and developing of consciousness in communities through the Aristotelian principle that individual fulfillment can be achieved through participation in improving the quality of life by working with others for the common good (Kruger and Sturtevant 2003). This democratic participation allows people to discuss, formulate, and decide public issues that are important to them and that directly affect their lives. In this research, managers, scientists, and planners take on new roles as facilitators and teachers, guiding public deliberation *from below*. Participatory action research accommodates the present paradigm shift away from the public land management leviathan born of centralization, specialization, rationalism, depersonalization, and industrialism.

Conservation research seems to lack (1) participant-observer anthropological methods, (2) intervention methods in which scientists embed themselves in social processes, and (3) values elicitation based on specific communities and specific places. However, such research is emerging. Presented here is a summary of an anthropological investigation, followed by some intervention methods, and finally, some ideas about values elicitation.

Terre Satterfield (2002) provided a fascinating analysis of identity, knowledge, and emotion in the conflict between loggers and environmentalists over old-growth forests in Oregon. She reported that few environmental controversies have been more dramatic than that contest of political, economic, and scientific forces. Congressman DeFazio of Oregon described it as a "religious war." In the contests of culture and power, culture consists of shared webs of meaning, moral outlooks, and worldviews internalized in the behavior of the members of each culture versus the overarching, multiorigined, and multifaceted cultural resource that individuals draw upon while manipulating it to fit their own ends. Both loggers and environmentalists talk about the joy of being close to nature, about forest science, about being victims of greater economic and political forces, about

the implications of the past for the future landscape, and about being emotional activists. In shaping its vision of a new and better world, each group manipulates its references to reflect features of the overall social system perceived to be dominant (a process known as fugitive political conduct of subordinate groups). This is a creative means by which people reconfigure cultural systems. Oppositional dialogues are basic to identify cultural conflicts. Activists concerned with altering the status quo state their grievances and their imagined new and better worlds. They make repeated public statements about who they are and how different they are from their opponents. And they mobilize by staking out identity centered on territory and by invocations to common cause. Satterfield concluded that all battles about the physical environment are battles about place and the ties between place and identity. Both environmentalists and loggers make up communities attached to places, even though mobility and mass communication mean very few communities are integrated, geographically bounded wholes. Rather communities are made up of people in separate places (environmentalists in cities, loggers in rural settings) effectively becoming a single community through the continuous circulation of people, money, goods, and information.

The social identities of loggers and environmentalists were well established. Loggers were natural-resource workers, informed by applied science based on common sense empiricism, and reflecting the conservation ethic of the first Chief of the U.S. Forest Service, Gifford Pinchot (forests are fertile, renewable crops are in need of protection). The central concern of the loggers was the long-term sustainability of communities based on family-wage employment, a spirited logging ethos, and the forests. Environmentalists saw themselves as an ecological resistance movement deeply concerned with spirituality, aesthetics, and biocomplexity, willing to commit their minds and bodies to protecting old growth, and reflecting the land ethic of John Muir and Aldo Leopold. The two groups did not conform to traditional sociopolitical divisions based on class, gender, or political party. Both groups were sensitive to the privilege granted scientific explanations in policy formulations. But neither trusted science; both used it selectively to bolster their arguments.

Loggers were attracted to science that makes common sense (sidenote 20) and knowledge gained through practice. Given the collapse of modern science and its contention that forestry should be a rationalized agricultural process, loggers were left to develop their own identity-based critique of expert knowledge, especially when expert opinion violated common sense. Environmentalists preferred science that acknowledged the mystery and sanctity of the

**Sidenote 20**—Albert Einstein once said, "Common sense is both the refinement of everyday thinking and the collection of prejudices acquired by the age of eighteen" (Satterfield 2002).

natural world. Environmentalists were especially ambivalent about science because of their uncertainty about exactly where to place an eco-centered self in the field of authoritative knowledge. Satterfield states that an abstract, deeply ambivalent, and anti-applied image of science is entirely consistent with a belief in the need for humans to maintain a humble, unintrusive stance toward nature. Thus, both groups sought to rewrite the criteria for valid knowledge.

Satterfield goes on to recount the history of the exploitation of natural resources in the Pacific Northwest and feelings of betrayal both groups experienced at the hands of federal managers, stating, "The destruction of communities and the depletion of resources have distinguished the political economy of Washington, Oregon, and northern California." In describing the contrast of the environmentalist nostalgia and glorification of past epochs with the loggers' idea of rural living embedded in an ecologically benign lifestyle (with a historical claim to place), Satterfield asks "Under what temporal, social, and even spiritual arrangement do claims of place attachment become legitimate?" Satterfield's anthropological participant-observer research provides considerable understanding to policymakers and stakeholders in conservation debates. Her book certainly provides a basis for mutual understanding and a resource for achieving some common vision. She concludes that the conflict will not be solved, and improved logging practices will not be created if the more imaginative and experientially wise activists on both sides are silenced. In determining values of stakeholders, moral concerns, situational uniqueness, and context specificity of imaginings makes elicitation of values by discussions and surveys problematic. There are two key considerations: (1) Language, power, and creative thought are not captured by value-elicitation processes dominated by economic approaches such as cost:benefit analyses that assume the majority of the public endorses rational, economic expression of the market values of nature and that monetary expressions of value reflect that which is held dear, worthy of protection, and ethically or socially esteemed. Economic approaches privilege some actors and marginalize others. (2) Stakeholder values are not neat and discrete, but contextual. These conclusions lead one to conclude that data collection and analysis by centralized staffs for use by line officers in decisionmaking are likely to be poorly informative; direct participation by stakeholders in deliberations about specific policies and practices in specific contexts and places are more likely to capture the desires of the stakeholders.

Place is a powerful social influence on conservation politics, and place-based inquiry brings to the fore the diverse ways in which

values and meanings are articulated and negotiated, but which are typically excluded in conservation decisionmaking (Cheng et al. 2003).

**Forest ecology—**Perry (1998) identified the major scientific challenges for conservation as understanding (1) the relationship between managed forest structure and ecological function at the stand scale; (2) spatial patterning of stand-level structures that meet biodiversity goals for a given bioregion; and (3) temporal dynamics of stand and landscape structures resulting from natural disturbance, anthropogenic disturbance, and their interactions. He reviewed the major strategies of ecosystem management and their failings and concluded that (1) reserves cannot be large enough to preserve regional biodiversity; we also need managed forest to function to conserve biodiversity; (2) it is a false belief that logging of any kind fits within the range of natural variation; the question is, how far can management depart from natural disturbances before compromising system integrity?; (3) complexity and stability are linked but poorly understood; we need a better understanding of structure, process, and function at local and landscape scales. Conservation research has been focusing on fragments of narrow problems, never mind the major problems facing humanity (sidenote 21). A narrow disjunct focus reflecting disciplinary myopia is not serving us well (Ehrenfeld 2002, Stevens and Montgomery 2002).

**Collaborative management—**Improved problem solving and leadership are needed to address conservation problems. Interdisciplinary problem solving incorporating problem definition in human-social terms, mapping the social (sidenote 22) and decision processes, analyzing basic beliefs, and clarifying one's own worldview are necessary (Clark 2001) (sidenote 23). But, take these truths to be self-evident (Wondolleck and Yaffee 2000): (1) agencies tend to be biased and ineffective, (2) traditional decisionmaking has been biased and ineffective, and (3) people are frustrated by the adversarial decisionmaking process. Even with massive investments of time, money, and interdisciplinary science, conservation decisionmaking by federal agencies in the Pacific Northwest produced ongoing controversy (Associated Press 2003, Barnard 2003, Dodge 2002, Dombeck and Thomas 2003, McCool and Kruger 2003, Milstein 2002). Conservation scientists (Anderson et al. 1999) have recommended left-brain approaches (a priori agreement on analyses, rules, structure, and order) that are more likely to be perceived as the power politics of science rather than attempts at consensus building. In

**Sidenote 21**—The world's most important problems, according to Ehrenfeld (2002):

- Materialism
- Deterioration of communities
- Anomie
- Commercialization of formally communal functions (health, charity, communication)
- The growth imperative
- Exploitation of the Third World
- Disintegration of agriculture
- Ignorance of the ecology of diseases, especially epidemic disease
- Loss of important skills and knowledge
- Devastating decline in the moral and cultural-intellectual education of children
- Impoverishment and devaluation of language
- A turn from environmental and human realities to electronic substitutes

***A narrow disjunct focus reflecting disciplinary myopia is not serving us well.***

**Sidenote 22**—The social process includes (Clark 2001):

**Participants:**
- Who is participating?
- Who is demanding to participate?
- Who else should be participating?

**Perspectives:**
- Demands—What do the stakeholders want?
- Expectations—What are the stakeholder assumptions about the future?
- Identifications—On whose behalf are decisions being made and what are their perspectives?

**Situations:**
- In what situations do stakeholders interact?
- Where should they interact?

**Base values:**
- What are the assets and resources of the stakeholders?

**Strategies:**
- Which ones are being used or are available for use?

**Outcomes:**
- What are they?
- Who is benefiting?
- Who is being deprived?
- What should the distribution of values be?

actuality, these recommendations are a response to perceived bad faith on the part of some participants in collaborative data analysis. Collaborative learning requires open communication, diverse participation, unrestrained thinking, constructive conflict, democratic structure, multiple sources of knowledge, extended engagement, and facilitation (Schusler et al. 2003). The questions of who is at the table, who they represent, why ethical behavior is presumed, and what happens if consensus cannot be reached need to be emphasized (Overdevest 2000). Setting ground rules for process, interactions, behaviors, facilitation, attendance, and many other issues is essential. But true collaboration is needed.

Collaboration is the pooling of resources by two or more stakeholders to solve problems (Wondolleck and Yaffee 2000) (sidenote 24). But the key to conservation is to have all stakeholders fully represented in the collaboration and to proceed on the local level. Success in collaboration is defined in the perceptions of the participants, although objective and standardized measures of progress are desirable (Rolle 2002) (sidenote 25). As collaborative management matures, increasing emphasis should be put on continuous process improvement and the application of the principles of total quality management and adaptive management. Similarly, considerable experience has been gained with self-directed work teams in industry that can be applied to collaborative management groups (Harper and Harper 1993, Katzenbach and Smith 1993). These sophisticated approaches are becoming increasingly feasible as various stakeholders are becoming more sophisticated and often represented by well-trained and highly educated professionals employed or volunteering in nongovernmental organizations. As the complexity of conservation problems increases, so does the need for collaborative management, and the need for adequate funding of collaborative management. Conservation decisions have profound, sometimes irreversible effects, on local communities (McCool and Kruger 2003). Investment in collaborative learning and collaborative management is becoming increasingly common in the public, nonprofit, and industrial sectors. There seems to be no viable alternative; top-down, command-and-control approaches are inflexible and ineffective (Wondolleck and Yaffee 2000).

Collaborative management has a long history in the Pacific Northwest—over 230 successful public-private cooperatives have been established (Wondolleck and Yaffee 2000). The fifth national park to be designated was Mount Rainier National Park in 1899; its designation, unlike previous parks, arose from a people's campaign, well organized, sustained, and based in large part on a "love

of landscape" and Mount Rainier, "the mountain that was god," as a symbol of place (Catton 1996). Collaborative management evolved in response to problems caused by agency policy and land management, business practices, and impasses in conservation owing to conflicts that persist through administrative, legislative, and judicial processes. The consequences of the current dysfunctional modes of decisionmaking have been public alienation and pervasive mistrust. Six of ten Americans feel powerless and disenchanted; less than half express confidence in U.S. institutions. The roots of collaborative management are in the neighborhood and community and are not purely interest driven and are always, to some degree, place driven. A famous Pacific Northwest collaborative management group, the Quincy Library Group, has a strong sense of place; a local focus; shared problems, fears, and sense of crisis; shared goals and interests; a common vision statement; and compatible interests. Another famous Pacific Northwest group, the Applegate Partnership, has a similar character. An emerging overarching conservation objective, for which there seems to be an evolving consensus, is sustainability. Conservation collaborative management recognizes the need to integrate different geographic and temporal scales and the need to deal with complexity, uncertainty, and change. Collaborative management not only acknowledges, but also makes sense of the three principal human communities (place, identity, and interest) and decentralizes decisionmaking, producing a civic environmentalism.

The benefits of collaborative management include effective decisionmaking; improved understanding among agencies, organizations, and the public; cross-boundary coordination; and improved capacity to deal with future challenges (Michaels et al. 2001, Wondolleck and Yaffee 2000, Yaffee and Wondolleck 2000) (sidenote 26). Collaborative management requires processes that include early, frequent, and ongoing involvement; substantive involvement; consensus decisionmaking; inclusive and representative makeup; cooperative, not adversarial attitudes; and flexible, positive attitudes. Collaborative management requires collaborative learning—joint fact finding, inventing options collaboratively, and developing a common understanding with a base of scientific information and information from independent, outside experts and scientists (Wondolleck and Yaffee 2000).

Of course, collaborative management is not a panacea; concerns about collaborative management include accountability, adherence to law, the demands placed on public and private groups, cooption by local economic development interests, and problems in evaluation (Conley and Moote 2003, Overdevest 2000). Increasing emphasis is

**Sidenote 23**—Clark (2001) cites Lasswell's five tasks of problem orientation:

- Clarify goals or preferred outcomes.
- Describe trends including changes relevant to goals.
- Analyze factors that shape trends, including causes, motives, and policies.
- Make projections about likely future developments under various circumstances.
- Invent, evaluate, and select alternatives to pursue goals.

**Sidenote 24**—Resources, values, or bases of power can be quite diverse (Clark 2001), e.g. people can give and receive:

- **Power:** support in making decisions in specific contexts
- **Enlightenment**: information
- **Wealth:** opportunity to control resources including money, people, and parcels of nature
- **Well-being:** opportunity for personal safety, health, and comfort
- **Skill:** opportunity to develop talents into operations of all kinds including professional, practical, and artistic skills
- **Affection:** friendship, loyalty, love, and intimacy in interpersonal situations
- **Respect:** recognition in a profession or community
- **Rectitude:** appraisal about responsible and ethical conduct

**Sidenote 25**—Rolle (2002) suggested that the progress of a collaborative group can be evaluated by its ability to (1) meet its mission and achieve outcomes; (2) be sustained; (3) understand the community; (4) be inclusive and diverse, reflect the community; (5) create a forum for diverse ideas and shared learning; (6) increase community capacity; (7) increase cooperation across organizational, administrative, and jurisdictional boundaries; (8) stimulate innovation, new ways of doing business; and (9) facilitate changes in policy, laws, and programs.

**Sidenote 26**—Successful collaborative efforts (Wondolleck and Yaffee 2000):

- Build on a sense of community/shared vision
- Create new opportunities for interaction among diverse groups
- Generate effective and enduring processes
- Develop more open, flexible, and holistic mind sets
- Establish responsibility, ownership, and commitment
- Create proactive and entrepreneurial behavior
- Build support and resources from numerous sources

being placed on evaluating the efficacy and efficiency of conservation efforts worldwide (Bare et al. 2000, Christensen 2003). Collaborative management "takes a lot of care and feeding" (Wondolleck and Yaffee 2000). The basic dilemma is cooperation versus competition. That competition is more rational than cooperation from the point of the individual, and the collective will not do as well under competition as with cooperation, have been recognized since the time of Aristotle. Economics, evolutionary biology, and political science all presume individuals maximize self-interest and undermine cooperation. The prime example is Garrett Hardin's tragedy of the commons. Institutional barriers are numerous as are barriers owing to attitudes and perception. Singleton (2002) evaluated three cases of collaborative watershed planning in the Pacific Northwest. Success was impressive in some areas, but limited by difficulty in resolving core conflicts over equity, distributive effects of conservation planning, competing visions of nature, and goal. But, Singleton states, collaborative environmental policymaking is clearly an idea whose time has come. The rationale for devolution of decisionmaking power is that local people and local governments have clearer understandings of local socioeconomic and cultural circumstances and are better equipped to devise fine-tuned regulatory solutions to environmental problems than those who make top-down centralized decisions. What is needed is local autonomy coupled with broad accountability. The promise of collaborative management is satisfying local needs while conforming to state and federal law.

CHAPTER 4

# Conservation Revisited

Conservation is the set of attitudes, principles, and practices we adopt individually and collectively to meet people's needs and fulfill people's aspirations from nature while not diminishing the capacity of nature for renewal, for creativity and evolution, to meet the needs of future generations, and to support a present and future diversity of life on Earth. Biologically, diversity is defined in terms of genes, populations, species, and other taxa and levels of organization such as biotic communities and ecosystems. Biodiversity, however, is more than the variety of things in a defined set. Biodiversity is a concept with philosophical, social, economic, and political components because the diversity of life is an irreplaceable asset to humanity and the biosphere. Biodiversity is a blanket term for the natural biological wealth that is the foundation for human well-being. Nature seems a better term. The challenge of nature conservation is integrating diverse worldviews and philosophies to achieve general sustainability of human communities. Conservation of biodiversity (nature) is "… management of human interactions with the variety of life forms and ecosystems so as to maximize the benefits they provide today and maintain their potential to meet future generations' needs and aspirations" (Reid and Miller 1989).

Biodiversity is inseparable from the ecological, evolutionary,

and managerial processes of nature that affect biological diversity. These processes include climate change, weather patterns, hydrologic cycles, pollution, photosynthesis, soil generation, nutrient cycling, and maintenance of soil fertility, water cycling, predation, mutualism, competition, parasitism, pest control, silviculture, grazing management, agriculture, animal husbandry, and horticulture. Linkages among processes must be taken into account whether the goal is to obtain products from individual species, services from ecosystems, or to keep ecosystems in a natural state for future generations. Altering ecosystems affects both processes and biodiversity, but with a wide range of ecosystem- and alteration-specific outcomes. Nevertheless, there are guiding principles (Reid and Miller 1989):

- The mix of species making up a community changes constantly even under conditions of environmental stability; thus, conservation of biodiversity should not be aimed at maintaining exact community composition, but at maintaining the overall variety of species while allowing ecosystems to change.
- Biodiversity increases with environmental heterogeneity at multiple scales.
- Spatial heterogeneity influences not only the composition of species within a community but also the interactions among species, including competition, parasitism, and predation.
- Periodic disturbances are important in creating mosaics that foster high species diversity.
- Size and isolation can influence community composition, as can the transition zones between communities.
- Certain species have disproportionate influences on ecosystems; some species are prone to extirpation.

Thus, understanding how complex systems emerge from the interaction of biological entities at all levels with the external environment is critical to understanding ecosystem function; a systems approach is necessary. Biocomplexity, not just biological diversity, is the defining property of ecosystems (Dybas 2001).

Given that current extinction rates are high and accelerating and that human populations are growing, using more resources, and generating more wastes, Pimm et al. (2001) asked, "Can we defy Nature's end?" They answered themselves: the first priority is protecting remaining natural ecosystems. They concluded that saving the remaining diversity is possible. Globally, the greatest harm is impacts on vulnerable diverse areas that contribute relatively little to human economic well-being, such as humid tropical forests that

contain two-thirds of all terrestrial species and the Amazon, Congo, and Southeast Asia rivers that contain one-half the freshwater fish species. They also concluded that protecting diversity is economically feasible. But there is no single answer to protecting diversity. The Pimm approach protects biodiversity for its intrinsic values. Protected areas and reserves are not sufficient for either simple species conservation or to maintain the capacity of nature to provide future generations of people, other animals, plants, and fungi with the same opportunities for quality of life and evolution today's species have. The most pressing need today is to train and empower conservation professionals to meet with interested citizens, help them assemble into collaborative learning communities, and to inform and facilitate a process of collaborative management (see also Pinchot Institute for Conservation 2001). Conservation organizations need to modernize and begin using 21st-century methods of organizational and professional management and development (French et al. 1994, Katzenbach and Smith 1993, Rummler and Brache 1995, Senge 1990). Agencies need financial and political support to develop their human capacities. Conservation research and management should be distributed away from centralized authorities and organizations, close to the front lines of on-the-ground management. Certainly, immediate protection of biodiversity is needed in the Third World; hotspots and coldspots of diversity should be identified (Kareiva and Marvier 2003) (sidenote 27). Preservation of hotspots, regions with unusually high concentrations of endemics that have also suffered severe habitat destruction, such as tropical rain forest, oceanic islands, Mediterranean ecosystems in California and South Africa, is the reigning conservation paradigm. Other approaches can be taken in the First World, from reducing consumption and waste to managing the environment intentionally at multiple scales; from local community management of forests to governmental regionwide management and regulation of solid waste, air quality, water quality and supply, transportation networks, and energy supplies. There is a broad consensus that more research is needed on links between biodiversity, ecosystems, ecological services, and people. But there is a crying need for action research (French et al. 1994) that can enable people to come together to solve local problems.

Five years after the Rio conference in 1992 (callout 4), 1.3 billion people lived in absolute poverty, 20 percent of the world population lacked access to safe water, and 840 million people suffered malnutrition. Globalization of economies accelerated and led to accelerated environmental degradation. Citizens in the United States consumed in 1 year what citizens of Africa or India consume in their

**Sidenote 27**—Kareiva and Marvier (2003) asked what about coldspots (i.e., the Arctic or Serengeti)? The hotspot approach has five significant flaws:

- Hotspots for different taxa do not necessarily coincide, hotspots are often identified by plants lists that are not necessarily indicative of other taxa, and most taxa are unstudied.
- Degree of threat (present and future) is hard to quantify.
- The hotspot approach is reasonable only if the only goal is to protect the largest possible number of species in the smallest possible area.
- Focus on hotspots could allow major ecosystems to degrade.
- Hotspot conservation ignores environmental sustainability.

lifetimes. Problems of poverty, population growth, industrial and social development, depletion of natural resources, and destruction of the environment are closely interrelated and call for political transformation to sustainable development (Brown 2000). A substantial minority in the United States is concerned with intergenerational equity; but we need to make that a majority that is also concerned with intragenerational equity. We cannot pursue conservation without compassion, conscience, and consciousness.

In our ongoing cultural evolution, paradigms shift and, sometimes, new ones emerge. An emerging paradigm is the reflective, living systems paradigm (Elgin and LeDrew 1997). This paradigm includes a growing capacity for self-reflection and an ability to make fresh choices. It has a living system view of wholeness and interconnectedness. Its goal in life is to develop a balanced relationship between inner and outer selves and live in a way that is sustainable and compassionate, with conscious consumption. Conscious consumption is an ever-changing balance of inner and outer, material and spiritual, personal and social. Sense of self grows through conscious, loving, and creative participation in life. It is natural to respect all that exists as integral to the larger body of life. This paradigm bodes well for humanity. Older paradigms do not (Regier 1993).

**Callout 4—Rio Declaration on Environment and Development** (United Nations 1972)

The United Nations Conference on Environment and Development, having met at Rio de Janeiro from 3 to 14 June 1992, reaffirming the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972, and seeking to build upon it with the goal of establishing a new and equitable global partnership through the creation of new levels of cooperation among states, key sectors of societies and people, working towards international agreements which respect the interests of all and protect the integrity of the global environmental and developmental system, recognizing the integral and interdependent nature of the Earth, our home, proclaims that

- **Principle 1—**Human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.
- **Principle 2—**States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.
- **Principle 3—**The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.
- **Principle 4—**In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.
- **Principle 5—**All States and all people shall cooperate in the essential task of eradicating poverty as an indispensable requirement for sustainable development, in order to decrease the disparities in standards of living and better meet the needs of the majority of the people of the world.
- **Principle 6—**The special situation and needs of developing countries, particularly the least developed and those most environmentally vulnerable, shall be given special priority. International actions in the field of environment and development should also address the interests and needs of all countries.
- **Principle 7—**States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit to sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.
- **Principle 8—**To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.
- **Principle 9—**States should cooperate to strengthen endogenous capacity-building for sustainable development by improving scientific understanding through exchanges of scientific and technological knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.
- **Principle 10—**Environmental issues are best handled with participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decisionmaking processes. States shall facilitate and encourage public awareness and participation by making information widely available. Effective access to judicial and administrative proceedings, including redress and remedy, shall be provided.
- **Principle 11—**States shall enact effective environmental legislation. Environmental standards, management objectives and priorities should reflect the environmental and development context to which they apply. Standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries.
- **Principle 12—**States should cooperate to promote a supportive and open international economic system that would lead to economic growth and sustainable development in all countries, to better address the problems of environmental degradation. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing transboundary or global environmental problems should, as far as possible, be based on an international consensus.

- **Principle 13—**States shall develop national law regarding liability and compensation for the victims of pollution and other environmental damage. States shall also cooperate in an expeditious and more determined manner to develop further international law regarding liability and compensation for adverse effects of environmental damage caused by activities within their jurisdiction or control to areas beyond their jurisdiction.
- **Principle 14—**States should effectively cooperate to discourage or prevent the relocation and transfer to other States of any activities and substances that cause severe environmental degradation or are found to be harmful to human health.
- **Principle 15—**In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
- **Principle 16—**National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.
- **Principle 17—**Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.
- **Principle 18—**States shall immediately notify other States of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those States. Every effort shall be made by the international community to help States so afflicted.
- **Principle 19—**States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith.
- **Principle 20—**Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.
- **Principle 21—**The creativity, ideals and courage of the youth of the world should be mobilized to forge a global partnership in order to achieve sustainable development and ensure a better future for all.
- **Principle 22—**Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture, and interests and enable their effective participation in the achievement of sustainable development.
- **Principle 23—**The environment and natural resources of people under oppression, domination, and occupation shall be protected.
- **Principle 24—**Warfare is inherently destructive of sustainable development. States shall therefore respect international law providing protection for the environment in times of armed conflict and cooperate in its further development, as necessary.
- **Principle 25—**Peace, development and environmental protection are interdependent and indivisible.
- **Principle 26—**States shall resolve all their environmental disputes peacefully and by appropriate means in accordance with the Charter of the United Nations.
- **Principle 27—**States and people shall cooperate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development.

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