Social Ecology:
A New Pathway to Watershed Restoration

By
Kevin Preister, Ph.D.
Social Ecology Associates
P.O. Box 3493
Ashland, Oregon 97520
(541) 488-6978
Internet: kevpreis@jeffnet.org

and

James A. Kent, J.D.
James Kent Associates
AABC Building 210, Suite E
Aspen, Colorado 81611
(970) 920-4408
Fax: (970) 925-3238
Internet: kentj@csn.net
and
Senior Fellow for Culture and Ecology,
Center for the New West
Denver, Colorado

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INTRODUCTION

A story comes to mind as we think about and apply social ecological concepts in ecosystem restoration. The story comes from the South Pacific Islands and is about a protected species, the green sea turtle (*Chelonia mydas agassiz*). The sea turtle had become endangered because of local opportunists who kill the turtle for their shells and sell them on the black market. This practice is reducing the number of turtles to extinction. The federal agency in charge of protecting the turtle uses enforcement techniques that send agents onto the island to trap and prosecute offenders. When they have arrested one person, another opportunist emerges and the illegal killing and selling resumes. This enforcement process was not stopping the killing and restoring the ecosystem of the sea turtle. There are not enough agents to use this enforcement model to accomplish the task.

Preservation of the sea turtle requires an expanded approach to ecosystem restoration. To supplement the agents' enforcement program, local residents need to become involved in protection of the sea turtle. The agency will have to look outside their narrow response to the issue and recognize that recovery of the sea turtle will depend on the cultural recovery of the island residents. Island residents, in their cultural context, view the sea turtle as sacred. If the residents bring a rebirth to their culture, they will ensure that the sea turtle is protected as a sacred species. When species protection is accomplished through cultural restoration, the people have a reason to once again defend and protect the species. The mission of the agency is accomplished; an endangered species is saved; and, an endangered culture is brought back to life.

The most difficult part of the above scenario is for the agency to recognize that their wildlife goals can only be accomplished through direct interaction with the culture as part of a broader concept of ecosystem restoration.

Relevant stories like this need not be taken from exotic locations. We have in this nation a recent history of environmental legislation designed to institutionalize ecosystem or watershed restoration, from the Superfund legislation in which the Environmental Protection Agency regulates environmental clean-up; to the national effort to re-structure the Forest Service and the Bureau of Land Management (BLM) under the philosophy of ecosystem management; to state watershed health programs in Maryland, Oregon and other places.

The central thesis put forward in this paper is that, in many instances, successful watershed restoration depends on cultural restoration. Success in ecosystem restoration will depend on the good will, stewardship values, and participation of citizens. Hence, programs and policies must reflect local watershed knowledge, create an integration between community and scientific concerns, and develop incentives that favor stewardship behaviors. In short, we must "work through the culture" to succeed, not "manipulate the people" to accomplish pre-selected outcomes.

This chapter will outline the conceptual development of social ecology, particularly a model of productive harmony, and the elements of bio-social ecosystems. They are illustrated with case stories that show the implementation of productive harmony through an issue management approach. A new generation of work is described in efforts to implement ecosystem restoration in Applegate Valley, Oregon. We conclude with a discussion of the civic culture as it relates to watershed restoration.

THE DEVELOPMENT OF SOCIAL ECOLOGY

The term social ecology is most frequently associated with the writings of Murray Bookchin (1990). He cites the importance of geographic place, local control (through the concept of the municipality), empowerment of citizens, and the meshing of social and environmental goals. His conception can be considered an "eco-ideology," that is, underlying his work is a philosophy of anarchism that calls for the elimination of societal hierarchies (class, race, gender) as a means of creating ecologically-sound living.

While retaining some key elements of Bookchin's thinking about geographic place and empowerment of citizens, our conception of social ecology could better be considered an applied social ecology, based on a collective 45 years of experience between the authors in the area of social changes related to natural resource management. Our approach to social ecology seeks first to understand the relationship between physical and social environments in a specific area, and then to act upon that understanding in a way that creates adaptive change. *A social ecosystem is a culturally-defined geographic area within which people manage their lives and resources.* Under this perspective, it is recognized that humans (like wildlife) are naturally organized into geographic territories. Humans are embedded within informal systems comprised of horizontal networks and natural gathering places that can be systematically observed, measured, mapped, and mobilized. It is through cultural boundaries that the social ecosystem sustains and rejuvenates itself. These concepts are summarized in a series of articles for interested readers (FUND Pacific Associates 1981; Greiwe 1980; Kent 1994; Preister and Kent 1984).
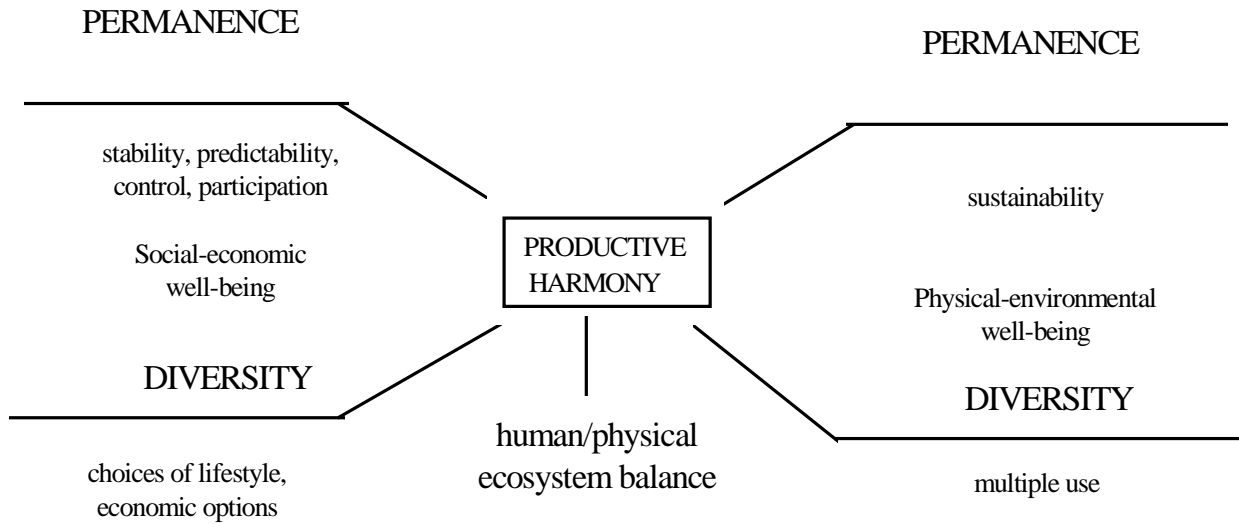
Productive Harmony

The concept of productive harmony can be used to describe the related concepts of physial and social environmental health as related to the National Environmental Policy Act of 1969 (NEPA) (Figure 1; Kent et al. 1994). The productive harmony model is based on Section 101(a) of NEPA, which states that environmental decisions and actions shall be made in ways that "create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans." Section 102 is the procedural requirements for carrying out an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) and has received the most attention over the years, but Section 101 has offered the most guidance in defining the social ecosystem process.

Productive harmony is defined as a healthy, balanced state of an environment where both social and physical resources have high levels of permanence and diversity, enabling their sustainability. Social resources are the people found in a culturally-defined geographic area, including their survival networks and their self-described boundaries around various living patterns and activities, called cultural descriptors. The authors have developed and used seven cultural descriptors to conduct community assessment and management programs over the last 25 years (Greiwe 1980; Kent 1992).

Physical resources include all the natural and biological attributes of a given geographic area, except the people. Such resources may be renewable (timber, wildlife, water, solar energy) or non-renewable (minerals, fossil fuels). Where social resources are concerned, permanence includes people's sense of stability coupled with their ability to participate in, predict, and control

Figure 1. The Bio-Social Ecosystem Model of Productive Harmony. Figure devised by Kent to recognize the social as well as the physical intent of NEPA.

PERMANENCE

PERMANENCE

stability, predictability,
control, participation

sustainability

Social-economic
well-being

PRODUCTIVE
HARMONY

Physical-environmental
well-being

DIVERSITY

DIVERSITY

choices of lifestyle,
economic options

human/physical
ecosystem balance

multiple use

events affecting their lives and the lives of their children, neighbors and kin. Where physical resources are concerned, permanence means that the yield of both renewable and non-renewable resources will continue well into the future. Diversity, in the context of social resources, refers to the range of options people have open in a human-geographic unit for social, cultural, and economic activities: With whom to associate (networks), where to live (settlement), how to earn a living (work), how to get and give help (support services), and where and how to have fun (recreation). Diversity in the context of physical resources is the variety and variability of natural resources that are interdependent in a systematic way (habitat continuum) such that each affects the viability of all other components (see also OTA 1987).

From a resource management perspective, productive harmony is achieved when actions affecting the total environment are reasonably judged to increase permanence and diversity in the long run. This end can be achieved when diversity and permanence are recovered, enhanced, and sustained through integrating both the social and physical arenas (Baharav et al. 1991). We call this integration a bio-social ecosystem.

The Bio-Social Ecosystem

A bio-social ecosystem approach recognizes the existence of the social ecosystem as an equal partner to the physical ecosystem. To the extent that federal land managers still drive environmental decisions strictly from a physical ecosystem perspective, current conflicts surrounding federal land use will not be alleviated. For example, the national ecological mapping project undertaken in 1993 by the Department of Interior is mainly concerned with mapping the physical ecosystem without recognizing, and therefore not incorporating, the social ecosystem. The conflicts that still surround the spotted owl, grazing on public lands, and numerous other biological issues on federal, state, and private lands today are based on a lack of recognition of the social or human ecosystem as critical to productive harmony and long term sustainability. The human element is still treated as a byproduct of the management of the physical resource (Kent et al. 1994).

Human-geographic boundaries, a key element in identifying the social ecosystem, rarely coincide with traditional administrative-political boundaries such as the boundaries of counties, states or national forests. As we come to view geographical regions as diversified biological and socio-economic systems, it is becoming increasingly difficult to constrain them within unnaturally imposed boundaries (Garreau 1982). Northern California and southern Oregon,

unified in a common history and eco-zone, have identified themselves as the "State of Jefferson" for at least three generations. This area actually seceded from the Union just prior to World War II because of the lack of responsiveness on the part of respective state capitals. The story won a Pulitzer prize for the San Francisco Chronicle reporter who covered it (Olson 1987). Today, in the context of ecosystem management, the Forest Service and BLM are presently re-drawing their management boundaries to coincide with watersheds, natural ecosystems, and geological provinces. Based on mapping informal cultural systems over the years, we have found that the human-geographic units often correspond at a certain scale to these ecological units; differences occur when technological intrusions or economic changes affect boundaries, such as a new highway, the loss of a sawmill or other developments (Kent and Quinkert 1986).

One undesirable consequence of using administrative rather than cultural boundaries is that the impact zone of decisions is not recognized, thereby leading over time to the fragmentation of either the social or the biological continuum. For example, in Colorado, the county land use code (also known as the "1041 Hazard Review") requires that wildlife biologists render information on wildlife with respect to the technical boundaries of a specific proposed project, while the major impact may lie a short distance outside the project boundaries (Baharav 1991). Once these informal boundaries are identified and their influence recognized, public land managers can be more successful in recognizing trends, be more proactive in addressing public issues, and manage change in a cultural context.

Implied in Figure One is a changed orientation to the social environment on the part of resource scientists and public land use managers. Residents are keen observers of changes in their environment and know it best (local knowledge); have strong values for stewardship and are
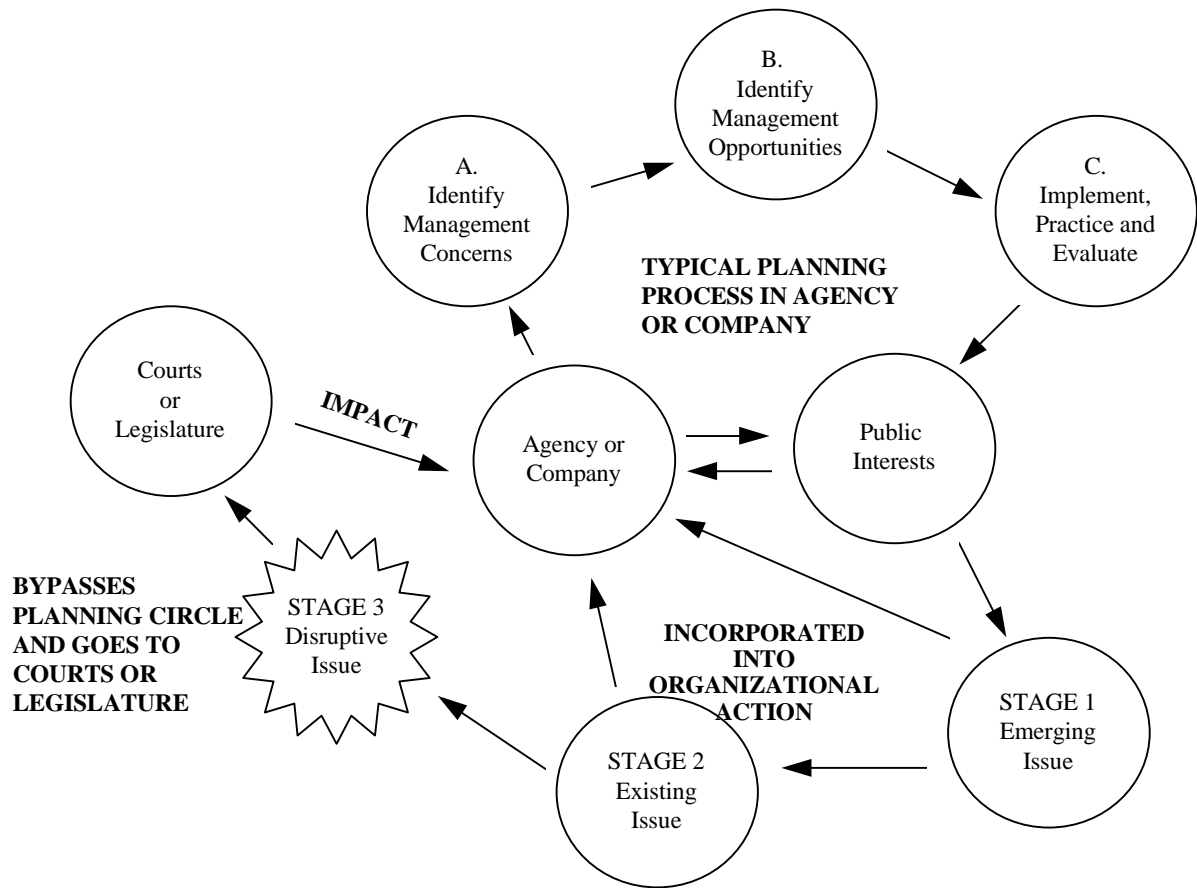
engaged in a variety of stewardship activities (local values); have a well-defined set of concerns about their social and physical environments (local issues) which, if acted upon in the context of their own frames of reference, are capable of generating a sense of empowerment and engagement related to the natural resource management (local action, that is, watershed or ecosystem restoration). For further discussion of these points, see Preister and Kent (1984).

IMPLEMENTING PRODUCTIVE HARMONY: THE ISSUE MANAGEMENT PROCESS

Issue Management is the project-based process of implementing productive harmony (Figure 2). Issue Management is the ability of an organization to identify three stages of issues--emerging, existing, and disruptive--and to respond to emerging public issues in such a way that the goals of both the organization and the community can be met. The inner set of circles in the figure shows the typical planning process of a company or agency--identify concerns, identify opportunities, implement and evaluate the management practice. The figure indicates that if issues are identified in the emerging stage, they have the most chance to be incorporated into the organizational planning process. Discovered only in the informal system, emerging issues can be resolved with the least time and resources. By definition, disruptive issues are beyond the control of local systems to resolve and are aggregated to higher levels of formal authority, such as Congress or the courts. Organizations caught in cycles of disruption are reactive organizations which cannot place information from their environment in any meaningful social context, and as a result, have no feedback mechanism and are bombarded by changes they cannot understand or manage. At this point, organizational staff project onto issue holders or their advocates negative characteristics ("vocal minority", "radical few"), and communication breaks down further.

Organizations that can place into cultural context the information they receive from the environment, and respond in appropriate and timely fashion, are strategic or learning organizations operating on the basis of knowledge and wisdom. Broadest public involvement is generated when emerging issues are the basis for management and decision-making processes.

Figure 2. The Process of Issue Management

B.
Identify Management Opportunities

A.
Identify Management Concerns

C.
Implement, Practice and Evaluate

TYPICAL PLANNING PROCESS IN AGENCY OR COMPANY

Courts or Legislature

IMPACT

Agency or Company

Public Interests

BYPASSES PLANNING CIRCLE AND GOES TO COURTS OR LEGISLATURE

STAGE 3 Disruptive Issue

INCORPORATED INTO ORGANIZATIONAL ACTION

STAGE 1 Emerging Issue

STAGE 2 Existing Issue

Unresolved emerging issues tend to become existing and disruptive. They are often appropriated by formal bodies, such as environmental or industry groups, which use them to bolster support for a political, economic, or ideological agenda, to be imposed on the local physical/social habitat.

Legal and political developments permitted the application of this model in a variety of settings during the last generation on the part of the authors and others. Two stories are related here that show Issue Management in a bio-social context of action.

The Beaver Creek Story

One of the earliest applications of the bio-social ecosystem approach to resource management evolved out of an effort beginning in 1971 to manage the impacts of proposed ski development at Beaver Creek by Vail Associates in the Colorado Rocky Mountains. This ski development was created in such a way as to save a historic local Hispanic mining community, local wildlife, and the family ranches. NEPA had just been passed and Dr. Kent and associates decided that this development would be the first test of the new law. They assisted the U.S.D.A. Forest Service, to employ an Issue Management approach to address off-site impacts beyond the Forest boundary. By incorporating the human habitat into the early stages of the Beaver Creek decision-making process, a potentially acrimonious fight over the issues was avoided while preparing an Environmental Assessment (EA). The Forest Service, much to its surprise, learned that their forest boundary was merely administrative and new boundaries were drawn that included the social and physical environment in a single bio-social ecosystem. This early

recognition and care in dealing with the community around this process saved the Beaver Creek project and the town of Minturn. Issue identification and resolution were so complete that the Beaver Creek Ski Area was approved in 1976 at the EA level. It never went to an Environmental Impact Statement (EIS), which is required if "significant" effects are discovered in the EA process.

Phase I construction was completed in 1981. The traditional employer in this small Hispanic mining town, New Jersey Zinc Mine, closed in 1977. Miners were laid off and their families could not have predicted impending changes. At the time of the mine closure, they were vulnerable to being driven from their valley by outside economic forces caused by the arrival of a new skiing and resort-catering industry with which they were culturally unfamiliar.

Instead, the Forest Service provided assistance during the EA process, and these undesirable adverse impacts were forecasted and avoided through a community diversification/environmental enhancement program. This effort was conceived as a mitigation measure and placed as a condition to the issuance of the ski area permit. Through cooperative issue identification among the Minturn community, the Forest Service, and Vail Associates, permit conditions were conceived to enhance the local community's diversification options that would lead to long-term permanence. Two hundred mining families and their community habitat were retained through a developer-funded small business ownership program to help miners become business owners. There are now over 30 Hispanic businesses employing over 400 people located throughout this area. A Manpower Conversion Program was developed that had several facets for moving people into skilled jobs, such as ski instructors and lift supervisors. A Life

Cycle Mitigation program was established that saw high school Hispanics entering college to study for hotel, restaurant, and ski area jobs that included management positions.

The physical integrity of the community, and the habitat for surrounding wildlife and ranchlands also were preserved. The Forest Service, with help from the Minturn community and Vail Associates, secured $5.9 million from the National Land and Water Conservation Fund for the purchase of 3,000 acres of private land surrounding Minturn. This created a "green belt" buffer where strip development otherwise would have occurred. In total, these socio-physical environmental enhancement programs were estimated, in 1993, to be worth over $1.2 billion as a cash credit to society. For a complete discussion of this process, see Larsh (1995).

In contrast, most stories of resource development are laced with putting people out of work, people having to leave the community, destruction of open land and natural ecosystems. Because of the creative use of issue management to address the boundary issues, through the productive harmony model, none of the destructive elements that usually cost society personally and financially occurred in Minturn.

The Smuggler Story

In 1989, the U.S. Environmental Protection Agency (EPA) was given the responsibility of cleaning up the Smuggler Superfund mining site in Aspen, Colorado. Because people live on top of lead mine tailings, clean up meant potential massive disruption of neighborhood residents. In human-geographic terms, the mining site is a neighborhood unit within the larger Aspen community, physically separated from the larger area by the Roaring Fork River, with access limited by two main entrances and a foot/bike path in and out of the community. This isolation created a strong sense of identity among the working people who helped each other with

resolving everyday issues. They communicated through word-of-mouth and in gathering places such as kitchens and the community center. To outsiders, such as EPA, this community looked like a disparate group of people who were powerless to deal with strong outside forces.

The Superfund law is a litigation law. Once an area is placed on the National Priority List, the people in that area are in litigation. In this type of situation, EPA relies on their regulatory and legal authority to impose their solutions on the people of Superfund sites. It was announced that each individual homeowner was personally liable, or a "Personal Responsible Party," and therefore responsible for the $16 million clean up bill. This approach took the people by surprise. Surprise evolved into fear and fear grew into anger. When the citizens tried to talk to EPA, the agency told them that they did not have anything to say about the specific points of the clean up, the worst of which was to remove 24 inches of dirt from their lawns and replace with clean fill. Trees would be lost and homes disrupted. EPA had no idea that people who have such a strong sense of place and understand their geographic boundary can become formidable opponents to clean up efforts.

The community mobilized to fight the clean up. They bridged out of their neighborhood boundary and involved influential people from the greater community of Aspen, and eventually from the region and the nation. Over the next two years, they launched a battle that drove EPA back from its original plans and changed the way Superfund is applied in mine clean up sites nationwide. The bio-social ecosystem approach was used to help EPA understand what was happening to the agency and how they could relate in a more culturally-sensitive manner to the site residents. The learning process for EPA was to realize that their administrative and legal world, while right by law, had to fit into the cultural world of the site residents. EPA learned that

they had to communicate through the local system of networks and gathering places and not just through formal meetings and written newsletters.

Once EPA understood how to recognize and communicate with the informal networks within the Smuggler area, they better understood the values people were using in opposing the clean up. Through the participation of local people, who demanded and received the appointment of a group of nationally-recognized lead experts to evaluate and monitor the site, the design of the total clean up effort was changed to accommodate the values and ideas that the residents had about the clean up. For instance, instead of stripping the whole site (over 400 homes), the residents suggested "hot spot" testing and clean up along with a health monitoring program. This alternative was finally agreed to by EPA (USEPA , amended Record of Decision, 1993).

In this case, the agency initially did not understand the importance of the human-geographic boundary that people saw as their protection. As long as the agency was outside the boundary and intruding, they were seen as the enemy. Once that boundary was understood and the agency stepped inside to work within the cultural context of the people to resolve their issues, solutions were forthcoming. The clean up is now being done in an enhancing manner that is creating productive harmony between the physical resource base and the social ecosystem of the area (Preister 1989).

A NEW GENERATION

The decision to list the northern spotted owl (S*trix occidantalis*) as a threatened or endangered species in 1989 by U.S. Fish and Wildlife created significant change in the Pacific Northwest and particularly in southern Oregon. Public timber sales were halted; for a variety of reasons, perhaps one third of timber-related employment was lost during this period; the politics

of forest management became even more contentious and polarized; and logging activity on private lands escalated sharply. Other, related social and demographic changes were occurring as well. The retirement population was growing and the in-migration of displaced urbanites was increasing. The economic shift from basic production (farming, ranching, fishing) to trade and services sectors deepened and widened; tourism and recreation became more important; suburbanization of the countryside became more widespread with larger homes whose residents had higher incomes and education levels. The local economic base had continued to shrink and reliance on commuting to urban jobs for rural residents had become the norm.

The Applegate Partnership

Located in southwest Oregon, the Applegate Watershed contains nearly one-half million acres. It is a biologically-diverse area because it escaped the last glaciation and served as the gene pool for the re-population of flora and fauna in the region (Wallace 1983). Its rural nature and high percentage of public lands meant that it was particularly hard hit by the changing politics of forest management resulting from loss of old growth forests and listing of the northern spotted owl. Against the backdrop of social, demographic and economic change, the Applegate Partnership was formed in 1992 as a response to the political gridlock affecting timber production and environmental protection. It was begun by residents, environmentalists, timber industry representatives, and later included personnel from the Forest Service and BLM.

The Applegate Partnership is a community-based effort to encourage and facilitate the use of natural resource principles that promote ecosystem health and diversity. Its major objective is to link community health and forest health. Its early success in promoting a collaborative planning effort among diverse interests prompted visits by Interior Secretary Babbitt and other

officials, and was specifically cited in President Clinton's Northwest Forest Plan as a model of community-based forestry.

Early history of the Partnership was invigorating because participants were able to break through stereotypes and misconceptions about the "other side." Outside observers variously characterized the Partnership as pawns of the industry or of environmentalist groups. Locally, it was perceived to be an environmental group, and long-time residents showed little interest in participating. Over time, however, the Partnership created a diverse base of participation that includes farmers, ranchers, miners, loggers, timber lobbying associations, and environmental groups. Its strength has been based on:

- a non-ideological, practical approach to issue resolution;

- remarkable individuals who have developed trust with each other despite enormous differences in outlook and despite regular and serious conflicts;

- frequent contacts, most often through weekly meetings and informal contact in gathering places;

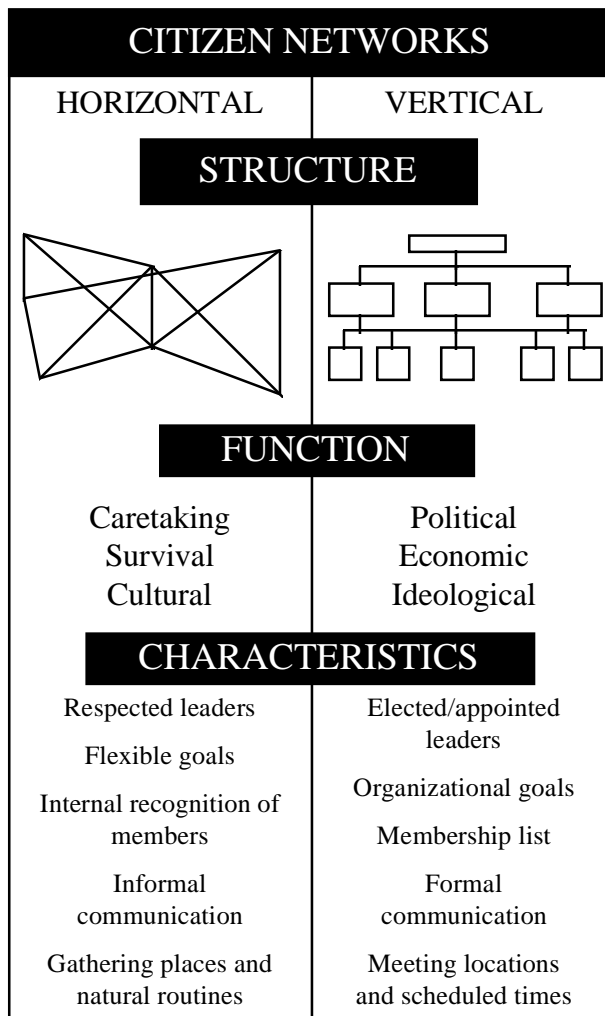- a commitment to outreach and to broadening the base of its community contacts.

The Partnership called for both physical and social ecosystem assessments. The ultimate aim was to integrate the two over time so that community and forest health would be synonymous within newly drawn human-geographic boundaries. A variety of reports were produced which documented the "state of health" in the physical and social environment (LaLande 1995; BLM et al. 1994; Applegate River Watershed Council 1994). Preister (1994) performed a community assessment using the methods described in this chapter. An economic assessment followed shortly (Reid and Russell 1995).

Horizontal Systems: The Key to Bio-Social Ecosystem Management

Humans organize themselves in two major ways, vertically and horizontally (Figure 3). The vertical system is hierarchical and formal, with established membership, leadership, chains of command and written communication. The pervasiveness of the vertical system developed during the industrial era, and was born of the societal need for centralization to meet consumptive demands. The function of the formal system is to maintain political, economic and ideological control. As the industrial era has shifted to the information age, the formal system is increasingly ineffective because of its inability to decentralize and link to the "grassroots" informal system. The informal system is characterized by social networks that support individuals in predictable ways, flexible goals, informal word-of-mouth communication through daily routines and gathering places, and respected leadership. The function of the informal system is survival, maintaining culture, and caretaking.

The formal/informal distinction guided our work in the Applegate Watershed so that a balanced assessment was accomplished. There was surprising consensus at the informal community level about forest management (Preister 1994). Despite all the press rhetoric about

Figure 3. Two Forms of Human Organization

CITIZEN NETWORKS	
HORIZONTAL	VERTICAL
STRUCTURE	
FUNCTION	
Caretaking Survival Cultural	Political Economic Ideological
CHARACTERISTICS	
Respected leaders	Elected/appointed leaders
Flexible goals	Organizational goals
Internal recognition of members	Membership list
Informal communication	Formal communication
Gathering places and natural routines	Meeting locations and scheduled times

differences, and the expectations of differences on the part of the natural resource agencies, residents reported common agreement about what constituted "balanced" forestry practice:

◊ Need for management
◊ No clearcuts/ use select cuts
◊ Harvest the dead/dying
◊ Use innovative ground methods of harvest
◊ Keep canopy intact
◊ Protect riparian areas
◊ Avoid south and west slopes
◊ Plant sooner and link success to future sales
◊ Use drought tolerant species

◊   Protect species diversity
◊   Accountability for actions
◊   Create value-added economic activity

A number of observations could be made about the politics of timber harvest in light of this list and using Figure 3 as a guide. First, controversy and competition occurs between regional and national leadership of the environmental community, industry, and land management agencies. The formal organizations fight over political, economic or ideological issues, whereas at the informal level of community in the valley, the high level of agreement about "balanced" forest practices was born of a pragmatic orientation to issues based on caretaking, survival and cultural values (Preister 1994).

The story of Thomas Freeson, a third generation farmer and logger in the Applegate Valley illustrates the dichotomy between formal and informal social settings. At the first public hearing regarding water and fish issues in the valley, his public statement was "The hell with the fish. My family's more important!" This was a remarkable and telling statement because Preister had been having periodic discussions for months with him in his kitchen about logging and water issues. Informally, this was a person who was proud of the sequoia in his front yard and of the rookeries down by the river and all the activities he had done to maintain his local habitat. The public setting, in an atmosphere of politics and regulation, had brought out his worst. In every day life, he practiced ecological values. This is an informal leader who has had influence in his community around restoration issues. In late 1995, he joined the Applegate Partnership Board.

The second point about the list of features regarding "balanced" forestry practice is that the polarized nature of the debate, which took place in formal, meeting-based settings, missed local knowledge and local culture regarding forest management. For example, it was discovered that the logging culture in the Applegate Valley had strong values for select cutting. In keeping with the "crop" metaphor that loggers use to describe the appropriateness of timber harvest, seed trees were left and clearcuts were a breach of values. The following is a quote by a well-known Applegate logger:

> "This damn agency (BLM) doesn't know what it's doing. We used to log selectively in this area 30 years ago and you couldn't tell we were in there. We left the trees under 16 inches and then came back in 4 or 5 years and got them. We used to plant, if we thought that it was getting too thin. We had controlled burns too. Then some fellow comes down from Portland and he starts telling us we aren't doing it right and makes us start clearcutting."

It's true that comments like this are self-serving, and it's also true that, with the emergence of clear-cutting policies in the 1970s, large logging firms emerged to respond to increased supply. The point is that values of the local culture were diminished by these changes. In an ecosystem context, the select cut kept an appropriate scale of operation functioning, such as the sawmill, small-scale logger supplies, and other support services. This scale, ecologically, is sustainable and can go on indefinitely. Clearcutting changed the scale and local predictability, shifting power to the formal, large operators and unbalancing productive harmony in the bio-social ecosystem.

Local Stewardship Practices

Another example of local stewardship practices involved the farmers along the Applegate River who used to have an informal management system to deal with minimum stream flows,

fish requirements and swimming holes. When the Applegate Dam and Lake were constructed in 1980, management shifted to federal and state agencies, and local participation and control were lost. These farmers and ranchers have a strong stewardship ethic whereby they protected the land in return for the productivity it provided. They readily acknowledge that mistakes were made, and they talk about them freely when they are in their gathering places out of public view.

Our point is that this stewardship ethic must be rewarded and worked with in order to create cultural alignment between old and new practices. Over time, farmers recognized the destructive aspects of irrigation ditches on fish populations. As they came to understand this issue, cost-sharing procedures were worked out with the State, and they installed fish screens and shifted to sprinkler irrigation. The current debate over pesticides, talked about over morning coffee in the gathering places, will result in behavioral shifts as well. If professionals pick up this issue at this emerging stage and work within the informal context, the time required to implement changes will be shortened.

The lack of management incentives to engage in ongoing citizen contact, and the polarization of public debate, have had consequences in the loss of local knowledge and local practices. For example, on agency tours of proposed timber sales, Preister has seen the wildlife concerns of residents dismissed because they were not grounded in the science of the agency. The dismissal could be observed in the body language of agency personnel who physically turned away from the speakers, in the failure to take notes about the concerns for possible follow-up, and in the disparaging remarks made later when the residents had gone home. Here, local knowledge and interest in the forest could have been used to further educate citizens, and the

perceptual world of agency and residents could have been brought closer together, as it was in the Smuggler story.

Through the Applegate Partnership, we have been able to use the results of the community assessment to build a participatory program of watershed restoration. Part of the effort has been to help the federal agencies adopt methods of geographic-based citizen contact and follow up. Traditionally, contact between residents and agencies was often limited to formal meetings. Under this approach, when the BLM proposed a modest timber sale (Panther Gap) involving "thinning from below" (taking younger age-classes, and leaving older), BLM staff met informally with people who identified their issues, their reasons for them, and even brought neighbors over to participate in the discussions. The agency people had had no training in "closing the loop" with citizens. That is, citizens were never re-contacted regarding whether or how their issue was addressed, nor were they included in the development of opportunities. When the agency released their EA, the concerns of local residents were highlighted as the basis of its analysis. When the EA was taken back to the gathering places to inform residents, they were then able to maintain dialogue and action around issues. This process has remained stable because permanence of the local culture was recognized--people were not surprised and the integrity of their social ecosystem was not intruded upon or fragmented.

This early learning paid off in the Lower Thompson Creek, a thinning and fire hazard reduction program of the BLM. The program was designed to implement ecosystem-based management on a landscape-level basis, and is among the first attempts to incorporate ecological, economic and local community objectives. A solid, positive and enthusiastic partnership was created between residents and the agency over the course of action to implement desired changes.

Early, traditional attempts at contact did not work--a mass mailing attracted nine people to a meeting. On the other hand, by utilizing the social ties of Applegate Partnership members, 30 to 50 people regularly began attending the numerous field tours. Word of mouth worked best to make use of the strong informal networks in the area. The level of trust was so high that a local citizen represented the agency on a tour for residents from a nearby drainage.

Through this informal process, citizens informed the agency about the many uses of the backroads, the areas that residents considered most in need of treatment, and the timing and sequencing of these activities. Residents became educated about the science of fire hazard assessment and treatment. Trust was established that timber was a by-product and not a "target" in the project. Therefore, timber issues were able to be set aside and were not used to disrupt the fire hazard project.

A map of the human neighborhoods of the Applegate Watershed has guided our work along a number of fronts (Figure 4). Two scales are depicted, the five Neighborhood Resource

Figure 4. The Human-Geographic Map of the Applegate Valley
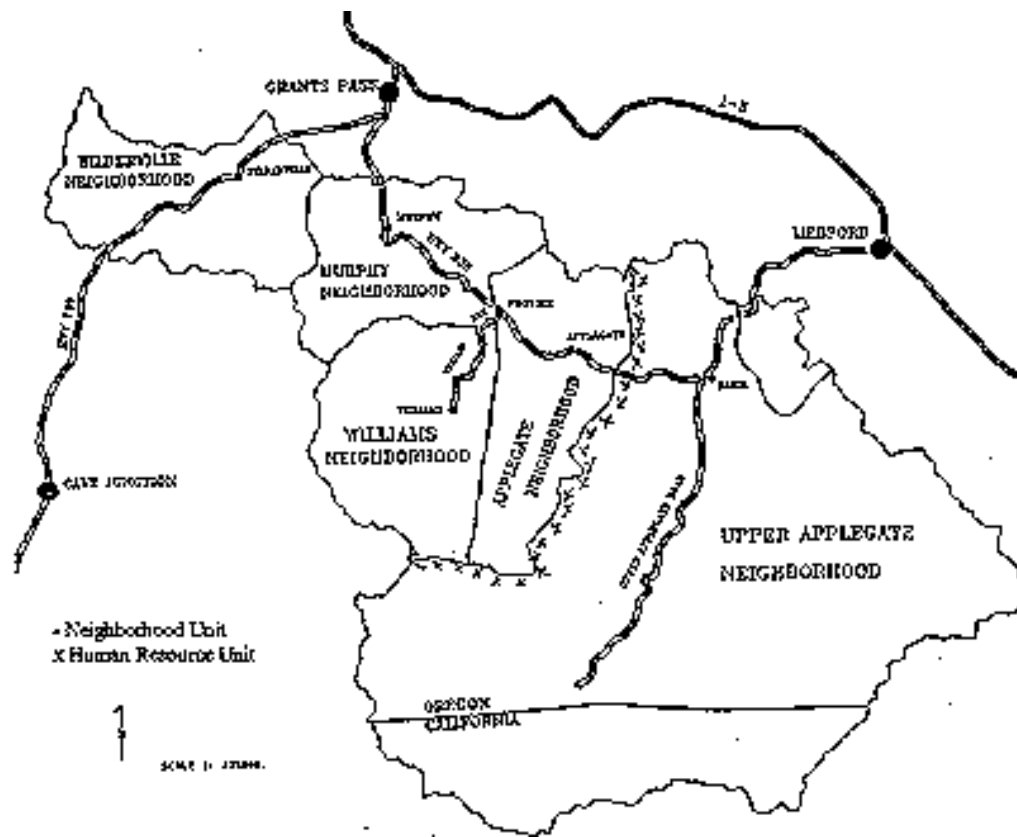
Units which are predictors of social ties and issue distribution based on a very small scale, and two larger areas, called Human Resource Units, one associated with Josephine County and the other with Jackson County. Human Resource Units are an aggregation of neighborhood areas that share a common history, economic base and value orientation. Traditionally, this line has roughly corresponded to county boundaries, but the line has shifted east to the Thompson Creek drainage because of a growing perception that Jackson County is too "urban" and reflecting a greater affinity with the "rural" identity of Josephine County. A vote by this area in 1994 to join the Josephine County school district rather than Medford in Jackson County is evidence of this rural identity.

The neighborhood map, drawn to reflect the physical and social ecosystem boundaries, guides project planning, public participation and issue management. It has been used to organize woods workers to review potential sales of small diameter trees, guide project review related to other programs, prioritize sites and treatment approaches for the fire hazard plan, and guide outreach efforts for education. Once the human-geographic boundary is drawn, resources can be managed in a manner that increases permanence and diversity within this bio-social ecosystem.

In addition to working with the federal agencies, the Partnership has undertaken to become the Applegate River Watershed Council, under the auspices of the State of Oregon, in order to develop and implement restoration activities in the watershed. The broadened contact, the appreciation for local issues, and heightened awareness of the Partnership, created conditions in which trust and good will were generated. Initially, we heard language like, "This is another government program," and, "I don't need government help to do things I've been doing all along," and "This is another ploy by the State to get control of our water." Other areas of the state experienced the situation where the above language came to characterize and fracture its program, and successes have not been nearly as dramatic. The accomplishments of the watershed health program in the Applegate Valley include:

- Grading, graveling and developing sediment catch basins on the Rush Creek Road on the Little Applegate River;

- Building a new headgate with a solar powered fish screen on the Kubli Ditch near Ruch; the Laurel Hill ditch headgate and fish screen was completed;

- Installing fish structures and rearing habitat along the Little Applegate River;

- Developing Northwestern Pond Turtle (*Clemmys marmorata marmorata*) habitat along the Little Applegate River;

- Planting 100,000 hardwoods and conifers on over 200 private properties throughout the watershed ;

- Working with the Forest Service and the ranching community to develop an experimental project on the Applegate grazing allotments;

- Writing and printing the bi-monthly *Applegator* newsletter, which is distributed to all 12,000 residents of the Applegate River Watershed;

Although the above accomplishments are, in retrospect, easy to list, the following story reflects the process one goes through to become grounded in the local culture.

No One Talked to Johnnie Ray

Johnnie Ray (J.R.) Fisher is the "last and the youngest" of the oldtimers in the valley. His family owned one of the last sawmills in the valley and J.R. operates a feedlot on his property. He is valued by oldtimers as a hard-worker--as one of the few "custom" farmers, he leases property from others for growing alfalfa and other hay crops. He is derided by newcomers and environmentalists because of the smell of his feedlot and the degradation of the stream by having the feedlot so near. Agency people generally fell into this latter category of critic, and for years they drove by his property secretly wishing it would disappear.

No one, however, had talked to Johnnie Ray. Finally, Preister and a Forest Service employee went to make his acquaintance within his natural habitat. We stood in his muddy field in our street shoes, listening to the idle of J.R.'s tractor while he considered our opening greeting. Eventually, after the visitors began to squirm in the silence, he said, "You know, it's all about

communication." This statement opened the door for a dialogue based on acceptance and respect between the parties. We informed him about the Applegate Partnership and its goals. He described the challenges of his agricultural operation. We learned from this conversation that he was passionate about soils--this was one of his key interests. Within two months, a soils specialist from the Forest Service and Preister, who was now acting as a communication bridger, visited him in his home for about three hours in the evening, talking soils and eventually getting around to the concerns about his feedlot. He smiled and said, "I know what my reputation is out there. Times change and so do I."

We learned that J.R. had intimate knowledge of his resources but needed a personal connection to create a pathway for becoming involved in resource restoration. From these initial contacts in his home, J.R. went on to sign up for a state watershed health program grant to move his feedlot back from the stream, fence cattle out of the stream and plant several hundred trees. The restoration project is currently well underway and has been written up in the local newspaper.

Next Steps

When selected burning was eliminated in the Valley 80 years ago (a practice determined through the social environment), the consequence for the physical environment was the creation of densely overstocked stands of small diameter trees which represented the loss of permanence and diversity. Productive harmony is directly put at risk because of the lower productivity of the land and the risks of catastrophic fire. Fire hazard is probably the number one environmental issue in the valley, with residents pointing out that they have addressed thinning and insect

problems on their lands, only to look over the fence at public lands to see that the same had not been done.

After three years of ecosystem management planning, as called for in the Northwest Forest Plan (USDA Forest Service and USDI BLM 1994), the agencies are ready to proceed with a fuels management program. The professionals bring to this program a set of filters based on scientific and technical information, such as highest areas of risk from the standpoint of vegetation, slope, and aspect. Other considerations include the presence of sensitive wildlife habitat, air quality standards, wind patterns, and so on. Community residents, who are threatened by the risk of wildfires, have identified priority areas from a residential standpoint: lower elevation sites, areas next to residences, insect-affected areas, and to avoid high country or previously un-roaded areas. Residents are having a direct influence on which areas are selected, the nature and timing of treatment, and the long-term elements of the program. These agreements will be reached through the horizontal, informal communication systems in order to focus on pragmatic, environmentally and geographically-sensitive approaches to moving forward. By working directly with the stakeholders, rather than large groups representing political, economic or ideological interests, specific management programs are designed that fit the local ecosystem requirements.

These and other coming projects illustrate the importance of maintaining permanence and diversity in the bio-social ecosystem. The efforts are clearly directed towards forest health (maintaining bio-diversity, promoting long-term stability), and are oriented to include as an equal partner community health (diversity of economic options, current stewardship interests, participation in decision-making).

THE CIVIC CULTURE

In this paper we have stressed the importance of working within a cultural context, as a prerequisite for successful watershed restoration. Our stories illustrate the need for an awareness of informal networks, word of mouth communication, gathering places, local knowledge, respect for each other, emerging issues and their significance, and the human-geographic boundaries within which people identify with the land and their community. These features are the basis of a social ecological understanding of human habitat and its relationship with the physical environment. We maintain that social ecology must be conceptually and operationally integrated with physical resource management in order for watershed restoration to be successful. Cultural restoration is often the key to ecological restoration, and is embodied in the concept of productive harmony as set forth in Section 101 of NEPA.

One of Tocqueville's key observations of the United States in the 1830s was the impressive breadth and depth of the civic culture--large numbers of civic associations for example, dealing with everything from religion to commerce. In a 1995 article in Journal of Democracy entitled, "Bowling Alone," Robert Putnam pointed out that, "By almost every measure, Americans' direct engagement in politics and government has fallen steadily and sharply over the last generation" (Putnam 1995: 68). His facetious measure for this change is bowling: he observes that more Americans than ever before are bowling, but that they are less involved in leagues and are "bowling alone." Putnam's observations concerning participation in politics and government relate to the collapse of citizens' trust in formal structures. He did not account for the engagement people have in directly influencing their specific geographic setting. People or organizations that wish to restore watershed health must understand and utilize the so-

called invisible, but viable, informal horizontal systems that local communities employ on a daily basis for survival, cultural maintenance and caretaking. These informal systems represent a new civic order of the information age and must be identified and engaged for watershed planning and restoration.

Figure 5. A Model of Civic Culture
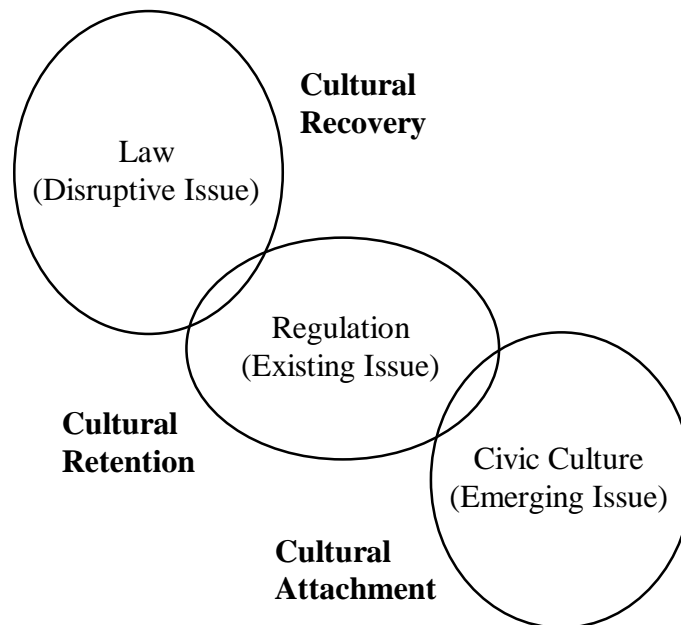
Laws are linked to the resolution of disruptive issues (Figure 5). By definition, disruptive issues go beyond the limits of local resolution--they are resolved by outside political and judicial entities of society. Disruptive issues like civil rights, Love Canal, and the spotted owl, have resulted in national legislation for resolution. Regulations are attempts by agencies to resolve existing issues (Figure 5).

Civic culture, on the other hand, is the setting in which emerging issues are resolved. When you hear language like, "This is the way we do things around here," and, "It used to be that

a handshake was all you would need," you are hearing a statement regarding the civic culture.

Civic culture is the traditional means of issue resolution at the local level. It's what happens when you have a problem with your child's teacher, or the bus stop is inconveniently located for your routines, or a street-widening happens without notification, or a timber sale is announced in your viewshed. That is, you have people with whom you can discuss emerging issues and mobilize a set of resources to resolve the issue. A civic culture is a true meshing of local interests and professional leadership.

One objective of current watershed restoration efforts is to recognize and support the civic culture. It is a birthright, as Tocqueville pointed out so long ago, and policies can support it, as Putnam (1995) argues. We want residents to be able to say, "Yes, we called the Forest Service yesterday and they said they'd come out this week and see about getting this area treated by next month." This is customer-oriented, focused on professionals empowering citizens to learn and function in the best interest of their watershed. This is done by responding to people immediately when they have an issue. In the old model of resource management, these emerging and existing issues did not get solved, festering in the community until the agency sought support for a new program or project. Then agencies are blasted, not on the merits of the project, but because of the backlog of frustration and unresolved issues. We term this dynamic "issue-loading." Issue loading

often prevents agency staff from accomplishing the objectives of new projects. They end up fighting old battles over issues that they can no longer resolve.

If we can work within the civic culture, answering the question, "What can citizens do for themselves?", then regulation and law are less necessary. In truth, the Forest Service for decades

operated effectively because it knew how to operate within the civic culture at the local level.

Innumerable formal and informal agreements with constituents gave all players to Forest Service

decisions a measure of predictability and confidence about the future. As society changed and as

the agency became more centralized and commodity-driven, its ability to remain linked to the

civic culture was disrupted, and reliance on regulation and law became the norm. Power thereby

moved from informal, cultural systems to economic and ideological groups. Land management

agencies are shifting away from this legalistic position. Indeed, the Northwest Forest Plan

(USDA Forest Service and USDI BLM 1994) calls for social and ecological experimentation in

the ten regional pilot areas (called Adaptive Management Areas). The current struggle is what to

shift <u>to</u>, in order that the same cycle does not repeat itself. To operationalize sustainability, we

suggest an approach that recognizes humans as part of the ecosystem. The focus then shifts from

"public involvement in watershed management" to understanding the close, existing relationship

of humans to the land.

The advantage of staying in the civic culture is that it builds on the social and physical

assests of a geographic area, and avoids the pitfalls of a regulatory approach to problem-solving.

In highly disruptive situations, laws are relied upon to deal with the disruption because the civic

culture has not been utilized. For all the money spent on formal approaches to drug issues--more

law enforcement, more jails, the policy of "three strikes and you're out"--the only lasting

solutions take place when citizens physically and socially re-claim their streets and

neighborhoods. The same is true for ecosystem restoration.

CONCLUSIONS

The traditional premise of a regulatory approach is turned on its head in our conception of watershed restoration. Instead of asking, "How can we get those South Sea Islanders to stop killing sea turtles, or farmers to stop polluting watersheds by over-fertilizing, or logging companies from clearcutting?" we should be asking, "How can we make use of the social ecosystem to encourage South Sea Islanders to sustain the turtle population, farmers to maintain fish habitat, and logging companies to select cut?" One resident clearly defined the paradox between formal and informal systems. At a recent Applegate town hall meeting with the Oregon Department of Fish and Wildlife to discuss water and fish, he said, "Why don't we take all this money we are spending on regulation and pay farmers to have fish in the river? We could do it."

The National Marine Fisheries Services is considering listing as threatened numerous individual anadromous salmon (O*ncorhynchus kisutch*) and steelhead (O*ncorhyncus mykiss*) stocks in the Pacific Northwest. Farmers and others expect heavy human and financial costs if listings occur. In addition, rancorous public discord, based on political, economic or ideological interests, could be predicted. The State of Oregon is actively developing a plan to forestall the need for additional listings by relying on increasing volunteer measures, and by working in conjunction with regulatory agencies. The development of site-specific knowledge (that is, Applegate Watershed, Rogue Basin, and so on) will improve the accountability of each eco-zone. As local residents put it, they want a "report card" (that is, a social accounting) that will show progress toward a goal and give credit for the many thousands of stewardship activities engaged in by local residents--tree planting, erosion control, stream bank stabilization, irrigation ditch rehabilitation and water conservation (Loucks and Preister 1995). The authors see the emergence

of such social accounting as indispensable to measuring the benefits of bio-social management

and watersshed restoration.

   With the proper bio-social ecosystem boundaries drawn around the eco-zones, issues can

be addressed at the scale most appropriate for efficient and effective resolution. Issues that

cannot be resolved at the level of the local bio-social unit can be aggregated to the next level for

resolution. This process allows for citizens and agency personnel to keep track of the issue and to

mobilize resources specific to its resolution.

   The social ecosystem must become visible if the civic culture is to be mobilized to

participate in bio-social ecosystem restoration. It is the authors' wish that this chapter has taken

us a step closer to that reality.

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