Values, Emotions and Desired Outcomes Reflected in Public Responses to Forest Management Plans

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Abstract

This paper reports the results of analyses of six years of written public comments on forest management plans and projects pertaining to the Hoosier National Forest in Indiana. The goal of the research was to gain an understanding of public concerns for the use of the forest lands, within the fabric of their underlying values and emotions. Research methods included the development of a comprehensive taxonomy of expressed values, emotions, and desired outcomes found in the data set, followed by the computerized coding and analysis of the text. Quantitative and qualitative analyses revealed a wealth of information on emotions and values expressed by the public, and provide support for previous theoretical positions and empirical findings.

Keywords: *environmental values, emotions, public involvement, forest management, content analysis, qualitative analysis*

Managers of agencies overseeing public lands are confronted with an ever increasing volume, intensity, and diversity of public concern and comment regarding the use and disposition of these lands. Although the overt content and intent of the comments may seem clear, land managers are often at a loss for how to deal with voluminous, heated, and conflicted public comment. Members of the public may perceive that their comments are misunderstood or simply disregarded by the managers. In order to improve responsiveness to the public and to develop more successful management plans, it is necessary to derive a deeper understanding of who the interested publics are, what their concerns and desires are, and what values, beliefs, and feelings underlie these concerns. This is also a moral imperative in a democratic society.

The purpose of the research reported here was to reach an improved understanding of the various publics responding to Forest Service plans through qualitative and quantitative content analysis of an archive of public commenting letters. In this study, we created a taxonomy of values, emotions, and desired outcomes expressed in a sample of the entire set of letters from the public commenting on the development and revision of the Forest Plan for the Hoosier National Forest in Indiana.

Background

Values and emotions are crucial elements of public involvement in natural resource planning and management. Creighton (1983) views the public participation process as an adaptive process by which a broad range of values and world views may be reconciled. Based on the premise that "the purpose of public participation is to ensure consideration of the total range of values held by the public" (p. 152), he argues that public values constitute the most important information that a planner may receive.

A vast amount of social and psychological research has been conducted on the definition, characteristics, and measurement of human values (e.g., Rokeach 1968, 1973, 1979; Kluckhohn 1951, 1961; Perry 1954, 1968; and Williams 1979). Kluckhohn (1951, 395) has defined a value as an element of individual and social psychological processes:

> *a conception, explicit or implicit, distinctive of an individual or characteristic of a group of the desirable which influences the selection from available modes, means, and ends of action.*

More recently, an impressive amount of research has been conducted on environmental values, and on forest values in particular (e.g., Axelrod 1994; Bengston 1994a, 1994b; Dwyer, Schroeder and Gobster 1990; Hetherington, Daniel and Brown 1994; Kellert 1996; Kempton, Boster and Hartley 1995; Merchant 1992; and Stern, Dietz and Kalof 1993).

Among the disputed characteristics of values is the distinction between that which is valued ("a quality that an object or set of objects possesses either inherently or by

ascription)," and the "standards or conceptions of the desirable within an individual that guide behavior" (Adler 1956). Others make the same distinction between assigned and held values (e.g., Brown 1984).

Many researchers have grappled with the problem of developing scaling systems related to human values for testing purposes (Braithwaite and Scott 1991), but few of these specifically examine the environmental values we are concerned with here. Testing instruments that do touch on environmental values include the pioneering "Value Survey" developed by Rokeach (1968), which includes the beauty of nature and the arts as one of eighteen basic value elements. Rokeach addresses values as both a mode of conduct, or instrumental values, and as an end-state of existence, or terminal values. In the Value Survey, subjects are asked to rank order each of eighteen instrumental values and eighteen terminal values in terms of their importance as guiding principles in their lives.

Braithwaite and Law (1985) developed the Goal and Mode Values Inventories based on Rokeach's concept of values, but with an expanded set of goals and modes of conduct and a distinction between social and personal goals. Added value categories include concern for physical exercise as part of the personal goal of physical well-being and preserving the natural environment as part of the social goal of international harmony and equality (Braithwaite and Scott 1991).

Other value scales that are of relevance to this research include the East-West Questionnaire developed by Gilgen and Cho (1979) and Kluckhohn and Strodtbeck's Value Orientations (1961). The East-West Questionnaire is designed to measure Eastern versus Western orientations in belief systems and includes a *Man and Nature* element. The Value Orientation measures the orientations of respondents toward four common dilemmas. These dilemmas include human-nature scenarios that contrast humans as dominant over nature, subjected to nature, and in harmony with nature.

The particular value of the forest environment to individuals in a spiritual and cultural sense has also been addressed. For example, Dwyer, Schroeder and Gobster (1990) note the very personal ties that members of the public have towards forests, and the deep psychological, social and cultural roots of this attachment.

Evidence of the importance of forests to people is also found in a variety of empirical studies of environmental preference and experience (e.g., Altman and Wohlwill 1983; Appleton 1975; Kaplan 1989). Schroeder (1988, 10) uses this evidence to argue that forest managers should recognize the psychological and cultural value of trees, and seek to balance them with biological and economic values. The spiritual value of trees and forests is also given special attention by Schroeder (1992) who sees the lack of understanding of the importance of this dimension as a contributor to the crisis in forest management.

Addressing the use of values in the public participation process, Creighton (1983, 143) argues that "feelings and emotions are indicators of values, and differences in values are what citizen participation is all about." From this assumption, Creighton offers the following indicators of the presence of values in public testimony:

- Use of Values-Laden Language: Phrases such as "raping the land" or "bureaucratic juggernaut" reflect specific value orientations.
- Predicting a Dire Consequence: Various predictions of job loss, environmental destruction, and intolerable traffic levels indicate concern about valued objects.
- Referring to a Venerable Source: By quoting the Bible, a law, or a famous author, commenters attempt to fortify their position.

Vining (1992a, 1992b) has argued that emotionality is a commonplace, necessary, and functional characteristic of public involvement in issues of environmental concern, for a number of reasons. First, emotion serves a functional role of helping to interpret and organize information. Cognitive processes such as information storage or retrieval are accompanied by emotional processes. Thus, emotions associated with an event or object are stored and retrieved together. If an environmental issue calls up a similar event confronted earlier by the individual, it will tend to bring with it the emotions experienced previously.

A second function of emotion is to help summarize complex information. It is cognitively easier for the individual to recall the emotional conclusion associated with a complex environmental concern confronted in the past, than to remember the series of events that led to that conclusion. For example, anger associated with off-road vehicles (ORVs) or disgruntlement associated with management practices may be recalled when the events leading to those conclusions are not.

A third function of emotion is motivational. Strong emotion may bring people to public hearings to make their views known, notwithstanding associated inconveniences or fear of public speaking. With emotion serving as such a motivator, the common practice of discounting it could be dangerous. Similarly, emotion performs a highly effective communicative role through facial expression, body posture, and voice tone; means that are in many ways more expressive than verbal communication.

Finally, emotion helps to reveal value conflict. According to Mandler's (1984) conflict theory, emotions stem from discrepancies between desired and actual values. This is consistent with Lazarus' (1991) idea that emotion derives from goal achievement and goal frustration. Through

the mobilization of energy and resources, emotional arousal associated with value conflict may drive resolution of the conflict.

For a variety of reasons, public land managers have tended to discount the importance of emotion and value-laden responses of the public. In the United States, the National Environmental Policy Act of 1969 (NEPA) requires that land managers invite public comments on management plans and activities, but offers no insight into how these comments should be gathered, analyzed, interpreted, or integrated into decision making processes. Managers struggle with an avalanche of public comments with few guidelines on how to organize and summarize them. The most frequent type of analysis is the counting of votes for or against the planned activity or one of the alternatives. Codinvolve, a content analysis system developed by the USDA Forest Service (see Creighton 1981 for a description), is designed to formalize this process, but in our experience it is not widely used.

Neither Codinvolve, or "vote-counting" takes into consideration the values and emotions underlying the desired outcomes expressed in public comments. Managers are increasingly coming to understand the importance of values and emotions as rational motivators for the public to become involved and to voice their concerns.

If decision-makers do not satisfy the public that they are listening and considering what members of the public say, then the political process begins to break down. Because management decisions involve the weighing of value conflicts, the management decision-making process will engender some level of emotion on the part of the decision-makers themselves (Vining 1987, 1992b; Janis and Mann 1977). Yet, decision-makers and managers often deny the presence of this inevitable emotional component and find themselves at a loss for how to understand and respond to levels of emotion expressed by the public.

These arguments regarding the importance of values and emotions in public comments form the foundation for the current research. We sought to determine whether underlying value and emotional content of public commentary that is so often missed or dismissed could be detected systematically. We combined a grounded theoretical approach with the theoretical frameworks described above to develop a taxonomy of values and emotions that is driven both by the data and by theory.

Method

The Setting

The Hoosier National Forest in southern Indiana was the setting for this research. The Hoosier was chosen for its close proximity to several types of communities with a diverse, interested public, and the availability of a large body of written public comment spanning a number of years. These public comments, which stemmed from the Hoosier's land use planning process, formed the data set for our study.

The Hoosier National Forest covers 188,000 acres in the limestone belt of southern Indiana, which is noted for a karst-type topography of caves, sinkholes, disappearing streams, and mineral springs. The Hoosier is the only National Forest and the largest holding of public land in the State. This forest is characterized by a large number of private in-holdings, and is quite dissimilar to the more uniform holdings in national forests in the western United States. The Hoosier features scenic drives and hiking and bridle trails in a wooded setting. It offers camping and hunting during season and fishing and boating opportunities on four major lakes. Other features of the Hoosier include the 13,000-acre Charles C. Deam Wilderness, which offers hiking opportunities in a primitive setting, and the Pioneer Mothers' Memorial Forest, which is a tract of virgin timber often used in ecological studies.

The Hoosier is a highly valued resource to Indianans as well as to those in nearby portions of Ohio, Kentucky, and Illinois. The large number of population centers in and near the forest, as well as the patchwork of private in-holdings result in a good deal of population pressure on the forest and associated user and use conflicts. The importance of this forest resource to its public has led to a rich body of public comment.

The Data Set

The archival data evaluated as part of this research consists of three major phases of written public comment spanning a six-year time period[1] during which Hoosier National Forest officials were developing and revising the Forest Land Use Resource Management Plan. The first phase consisted of comments to the Hoosier on the Land Use Resource Management Plan as it was initially released in 1984. The second phase consisted of comments on a proposed amendment to the Plan that would have permitted off-road vehicle use in a portion of the Hoosier. The third phase consisted of letters commenting on a revised Forest Land Use Resource Management Plan, following litigation on the initial Plan and its amendments. There was a total of 4,832 letters received during these three phases of the planning process. Copies of the letters were obtained from the Hoosier National Forest Supervisor's Office. Identifying references were deleted from the text of the letters that was entered into a uniform electronic format for analysis.

Procedure

The unit of analysis that we chose for content code development and assignment was the paragraph. Several alternatives were possible, including a line of text, sentence, or entire letter. After careful consideration, we chose the paragraph because it allowed a better context of meaning than the line or sentence, and more specificity than the entire letter.

To develop a content taxonomy for the Hoosier data set we took an approach based on grounded theory (Strauss and Corbin 1994). We began by taking the narrative of the subjects as a basis, or ground, working up from these narratives to a listing of content categories. Although the value scales described earlier proved useful in developing ideas for relevant value categories, preparation of an entirely new taxonomy or system of description, constructed from the materials in the data set, was necessary in order to fully capture the complexity of the commenters' attitudes and belief systems. As a first step in this process, three experimenters independently reviewed the entire data set. The three experimenters were graduate students with varying academic backgrounds (environmental planning, social work, and political science). Two of the experimenters were blind to content categories that could be derived from theory on values and emotion. In their review of the data set, the experimenters sought an intuitive feel for the content of the letters and to develop early impressions of potential content categories and themes. This portion of research was similar to the field study approaches and techniques of data collection saturation and hypothesis building found in the ethnographer's approach to qualitative field research (Browne 1976; Taylor and Bogdan 1984; Weiss 1966; Whyte 1984) and in grounded theory (Glaser and Strauss 1967; Strauss and Corbin 1994).

Following an initial review of the letters, each experimenter independently developed a listing of content categories. Content categories were also established on an a priori basis from a review of the literature and meetings with Hoosier National Forest officials at the beginning of the research project. With the assistance of the senior author, an iterative process was employed to reach agreement on the specific content categories to be used. First, the content categories identified by each experimenter were reviewed. In many cases the three experimenters generated categories of meaning that were clearly the same. Consensus on other categories was achieved by comparing categories with possible overlap in meaning and clarifying category definitions. This often entailed a return to the data set in order to clarify content meanings. Once a set of content categories was established, definitions of each category were written by the group. A coding manual, which included the content categories and definitions was developed and used by the experimenters for subsequent coding of the data set (Dorsey, Larsen, Tyler, and Vining 1994).

In order to measure inter-coder reliability, a sample of fourteen letters was coded by the three experimenters. A coding outcome was defined as the assignment of a code category by at least one of the experimenters. There was a total of 371 coding outcomes. Reliability coefficients were calculated for all possible pairs of coding outcomes within each of the letters. The coefficients ranged from .45 to .92 with an average of .69. Given the complexity and size of the coding scheme, and the conservative determination of the coding outcome, this is a reasonable reliability value.[2]

A representative random sample of 1,237 (25.6%) of the letters was then coded by the three original experimenters based upon the coding scheme in Table 1. Each of the 8,453 paragraphs in that sample of the letters was reviewed and codes were assigned to it. Multiple codes were often assigned to a paragraph, but no code was used more than once per paragraph. Thus, a particular code may have been used more than once in a letter. The outcome codes were assigned to the entire letter only and were intended to capture the overall intent of the writer in terms of desired or undesired outcomes. The Text Analysis Program (Drass 1986) was then used to generate frequencies of codes overall.

Results

Forty eight content categories were identified and are listed in Table 1. For clarity, we organized these content codes into meta-categories. The description of the code categories below is followed by an analysis of code frequencies and initial qualitative analyses of selected content categories.

Content Meta-Categories

Values. The *Well-Being* content categories reflect content pertaining to the writer's well-being and sense of environmental quality. These categories include expressions of the spiritual and sacred aspects of nature and recreational activities, appreciation or concern for the aesthetics of the public lands, indications of the individual's mental or physical well-being related to the management plans, and indications of pleasure or love that were related to the forest or to activities therein.

Environmental Values is a large cluster of values with an environmental content or orientation. These are organized as either *Orientations* corresponding to held values or *Attributes*, corresponding to assigned value. Both of these may be present where an individual values an environmental attribute using a particular orientation. This distinction is often made in the literature on psychological values and was also found in grounded analyses of this data set.

The *Time* category was originally intended to be an organizational category by which to examine changes in frequencies of other codes that could be attributable to past, present, or future time frames. However, these categories may also indicate more fundamental concerns regarding heritage and posterity.

Negative Consequences refer to concerns expressed for the negative implications of an action on one or more specific values. Originally intended as organizational categories, these codes are also very useful to identify respondents' concerns for environmental attributes and associated strong emotions.

The *Ethics/Responsibility* categories indicate the presence of moral tone or reasoning, and reveal the writer's moral code, or rules for what should happen and how humans should behave. This meta-category includes Creighton's (1983) Venerable Source which refers to the writer's citation of another individual or moral code whose credibility is beyond reproach.

The *Individual Values* content categories refer to values associated with the writer's sense of personal worth. Indications of personal sacrifice are important indicators of how much the individual cared about the resource or the issue. Personal gain, in contrast, simply indicated what the writer had to gain by the suggested plan modification. *Personal Validation* is discussed below. The *Social Values* codes represent statements of social or societal values.

Emotions. Five emotion content categories were identified: *Anger/Disgust, Sadness/Fear/Distress, Hope/Optimism, Pleased/Satisfied,* and *Passion/Fervency*. The first four of these are most appropriately labeled as emotions while the fifth, *Passion/Fervency* is best understood as an expression of affect or intensity of feeling. Thus, by cross-tabulating an emotion with the affective code, one would be able to distinguish between strong and weak emotions.

Outcomes. Fifteen outcome codes were developed, representing the commenters' preferences for forest land use or disposition. These codes are most similar to the formal and informal systems by which public comments are often tabulated in the management context where a simple vote-counting process is often used.

Code Frequencies

Code frequencies for all of the categories except the outcomes were calculated as percents of total paragraphs coded and are presented in Table 2. Inspection of the frequencies reveals that nearly all of the code categories were used in the analysis of the data set. Although some of the code categories have low frequencies, all of the categories were grounded in the data. The ten most frequent codes are listed in italics in Table 2.

Environmental values were expressed frequently and often vociferously. The *Forest/Vegetation/Tree* code was assigned more frequently than any other, at 13.27% of paragraphs. Because the subject of the letters is the Hoosier National Forest, the frequency of the concern for and reference to the forest is logical. However, passages coded with this category often reflect deeper and more subtle content and are discussed in more detail in the qualitative analyses below.

Human Centered Concerns (10.34%) and *Economic Concerns* (6.40%) were also frequently expressed. The Hoosier National Forest contains many private inholdings and faces relatively intense population pressure and competition for commodities and recreational activities, many of which are in conflict with each other. The frequent presence of human and economic concerns is not surprising in this context. However, one would expect that similar analyses of public response to plans in other more remote public lands would present a different profile. The issues of preservation and protection of the resource and of wildlife and wildlife habitat were also frequently noted (7.5% and 6.85% respectively).

Other high frequency codes include *Sadness/Fear/Distress* (9.51%), *Damage* (9.69%), and *Destruction* (6.66%). An analysis of the co-occurrence of these codes is beyond the scope of this article. However, the frequent presence of these codes, along with the high frequency of the preservation code, is reminiscent of studies by Vining (1987) and Vining and Schroeder (1987) in which negative emotions and preservation values were associated. Further analyses will examine this and other questions regarding code category co-occurrences.

Moral Judgments (9.58%) were also frequently found, as were the writer's efforts at validating his or her stance (7.68%). A qualitative analysis of these content categories is presented below.

The frequencies of the *Outcome* codes are presented in Table 3. As noted previously, *Outcomes* were used only once in each letter, though more than one *Outcome* could be assigned to a letter. Thus, the percentages in Table 3 were calculated using the number of letters rather than number of paragraphs and the frequencies are not directly comparable with those of the other code categories. The *Off-Road Vehicle* codes were very frequently used, mirroring the importance of this issue during the Hoosier National Forest planning process. The sentiments regarding ORV's are divided nearly equally, emphasizing the difficulties faced by managers trying to balance multiple conflicting uses. *Timber* harvest opinions were also expressed frequently, with more than twice as many against harvesting than supporting it. This undoubtedly is not news to Forest managers who have struggled with public opinion regarding timber harvest for nearly forty years. Further qualitative analyses of the *Forest/Vegetation/Trees* code presented below provides additional insight into the complexity of the timber issue.

Table 1. Code meta-categories, categories, and descriptions.

CODE	DESCRIPTION
WELL BEING	Values contributing to and affirming an individuals' physical, mental, and spiritual well-being.
Spirituality / Sacredness	Spiritual reverence or religious concerns.
Aesthetics	Appreciation for beauty (or concern about lack thereof). May also include non-visual sense modalities.
Well-Being	Positive and negative effects on an individuals' well-being, from a mental, emotional, or physical standpoint. May include reference to feelings of serenity, renewal, and physical vigor.
Pleasure / Like	Positive feelings of pleasure, enjoyment, and appreciation associated with certain environments and activities.
ENVIRONMENTAL VALUES	Values with an environmental content or orientation.
Environmental Orientations	Held values indicating attitudes or philosophical orientation towards the natural environment.
Stewardship/ Management	Belief that humans have a responsibility to take care of the natural environment.
Intrinsic Worth	Belief that an environment or feature has value for its own sake or state of being, and not for any particular utility to others.
Interconnectedness / Ecological	All aspects of the environment, including humans, are interconnected, so that the survival and health of any one component affects all others.
Preservation / Protection	Desire for an environment or other valued attribute to be preserved and protected in its current or natural state, without human interference, and with minimal human use.
Conservation / Restoration	Humans should act to maintain and improve the natural environment.
Utilitarian	The natural environment as a resource base for human use and consumption.
Human Culpability	Human responsibility and blame for environmental events or conditions.
Environmental Attributes	Values assigned by an individual to environmental features.
Forest / Vegetation / Trees	Concern or appreciation for the forest environment, vegetation or plant life in general, and/or for trees.
Wildlife and Habitat	Concern or appreciation for particular animals, wildlife in general, and/or for wildlife habitat.
Land / Soil / Trails	Concern or appreciation for land as an component of the environment, for soil quality or loss (erosion), and for effects of trail building or use.
Air / Atmosphere / Ozone	Concern or appreciation for air quality, weather patterns, and air pollution, including ozone depletion.
Water	Concern or appreciation for water features (lakes, rivers, creeks, ponds), water quality, and water usage.
Unique Areas / Features	Concern or appreciation for particular areas or features of the environment that are unique in identifiable ways. Includes specific areas of the Hoosier NF, historic or cultural sites, etc.
Human Centered Concerns	Concern for particular elements of the environment that have direct implications for human health and safety. Includes traffic safety and hazards, fire hazard, crime, vandalism, and trespass.
Environment / Earth	Broad concern or appreciation for the environment as a general concept, including reference to planet earth as a whole.
Nature / Wilderness	Broad concern or appreciation for nature and/or wilderness as a general concept.
Scarcity / Rareness	Added value or concern may be applied to any attribute due to its perceived scarcity or rareness and fear of its loss.
TIME	Temporal values arose as the writers struggled to place his/her concerns into a larger perspective.
Heritage	Concern for the past, whether in the form of historical significance, a legacy, nostalgia, or personal memories.
Posterity	Concern for the future, usually with respect to future generations, or for the long-term implications of an action.
The Present	Concern for the here and now or the current generation, often with a sense of urgency.
NEGATIVE CONSEQUENCES	Fear or concern for the negative implications of an action on one or more specific values.
Damage	Disturbance, damage or harm to any aspect of the environment.
Destruction	Irreparable destruction of any aspect of the environment or other value. Sometimes indicates the ultimate apocalyptic vision of doom when applied globally.
ETHICS / RESPONSIBILITY	Moralistic stance on what should or should not happen, and how humans should behave.
Moral Judgements / Moral Tone	Judgement as to what is morally right or wrong. May include a moralistic tone as to what should or should not happen.
Integrity / Trust	Values of honesty and trust or questions about the motivations and honesty of certain groups or individuals.
Rights / Entitlement	Perceived rights or entitlement to aspects or uses of the environment by a particular individual or group.
Equity	Concern for fairness and equity in the use of the environment.
Responsibility	Concern for responsibility, duty or obligation, whether the respondent's own, or someone else's. Also irresponsibility.
Venerable Source	Reference or quotation from a source which is deeply respected or held in high esteem, in an effort to add credence and strength to the respondent's position.

Table 1. Code meta-categories, categories, and descriptions. ***(Continued)***

CODE	DESCRIPTION
INDIVIDUAL VALUES	
Personal Validation	Effort to validate or strengthen a position and cause a viewpoint to be taken more seriously through reference to certain facts about the writer.
Personal Sacrifice	Personal losses or hardships suffered or that may be endured should particular actions take place.
Personal Gain	Personal gains or benefits enjoyed or that may be accrued should particular actions take place.
SOCIAL VALUES	These values focus on the individual from a social perspective.
Family / Children	Concern for the basic family unit, or one's children in particular, in terms of certain activities or uses of the environment.
Fellowship / Bonding	The sharing of experiences with friends and others as a means of bonding in relationships and building of fellowship.
Cooperation / Compromise	Concern for and a belief in the power of human cooperation, sharing, and compromise in dealing with environmental concerns.
Recreation	Concern for and appreciation of recreational opportunities and activities in the environment.
Patriotism	Local, state, and/or national pride and loyalty with respect to the use and disposition of the environment.
MONETARY VALUES	
General Economic Concerns	Reference to any monetary or economic concerns. Because one group's loss may be another's gain, these concerns are not separated into positive versus negative impacts.
EMOTIONS	
Anger / Disgust	An active negative emotion, indicating the respondent's anger and/or disgust at certain actions, events, or concerns.
Sadness / Fear / Distress	A passive negative emotion, indicating the respondent's feelings of sorrow, distress or worry.
Hope / Optimism	A passive positive emotion expressing the respondent's hopeful or optimistic feelings.
Pleased / Satisfied	An active positive emotion expressing the respondent's happiness, pleasure or satisfaction.
Passion / Fervency	Includes strong, but indeterminate feelings.
III. OUTCOMES	
Off-Road Vehicle (ORV) Use	Support of or opposition to continued or expanded use of off-road vehicles in the forest.
Hunting	Support of or opposition to continued or expanded hunting opportunities in the forest.
Wilderness Preservation	Support of or opposition to continued or expanded preservation or wilderness (usually roadless areas) in the forest.
"Not In My Backyard"	Concerns for activities in nearby properties.
Timbering	Support of or opposition to continued or expanded logging activities in the forest.
Multiple Use	Support for the concept of multiple uses of the forest.
Mineral Leasing	Support of or opposition to continued or increased leasing of mineral extraction rights to forest land.

Initial Qualitative Analysis of Selected Codes

We selected several codes for exploratory qualitative analyses. Some of these codes were selected because they occurred frequently, and others such as Venerable Source were chosen for their importance in understanding values and emotions. These analyses were conducted by extracting all of the text assigned to each of these codes. We then reviewed this text, often numbering hundreds of paragraphs, with the goal of extracting meanings that could bear on the implementation of a management plan or on the study of human environment interactions.

Trees and Animals. Writers often referred to trees and forests, and animals and habitat. In addition, the timber harvest outcome codes were among the most frequently employed. The apparent simplicity of these assigned value codes is belied, however by the depth of meaning that further analysis of the text revealed.

The importance of trees borders on the sacred in our society (Cronon, 1991). In the past forty years, controversies have erupted surrounding the cutting of trees for nearly any purpose including timber harvest, street widening, ecosystem restoration, and residential or commercial development. A number of authors have proposed that our reverence of trees is revealed in myths and religions as well (e.g., Dwyer et al., 1990; Schroeder, 1992). In the present data set, writers found forests or vegetation significant for utilitarian, aesthetic, and spiritual reasons, often with a reverent and emotional tone:

> *What is a tree? A place to run to for shelter from the rain to keep yourself dry. To kick off your shoes and sit under with someone you love for a picnic — to hide from the sun. A place for little boys to climb and learn their lesson from the big fall. Love your trees, nurture them.*

Table 2. Code category frequencies expressed as percentages of total paragraphs coded (N=8453). The ten most frequent categories are in italics.

CODE CATEGORY	%	CODE CATEGORY	%
Well-Being		**Negative Consequences**	
Spirituality/Sacred	0.97	*Damage*	*9.69*
Aesthetics	5.16	*Destruction*	*6.66*
Well-Being	3.21	**Ethics/Responsibility**	
Pleasure	4.16	*Moral Judgment or Tone*	*9.58*
Environmental Values		Integrity/Trust	4.13
Stewardship/Management	0.86	Rights/Entitlement	6.08
Intrinsic Worth	1.22	Equity	4.99
Interconnectedness	1.74	Responsibility	5.17
Preservation/Protect	*7.50*	Venerable Source	1.11
Conservation/Restoration	4.52	**Individual Values**	
Utilitarian	5.05	*Personal Validation*	*7.68*
Human Culpability	2.82	Personal Sacrifice	2.73
Forest/Vegetation/Trees	*13.27*	Personal Gain	0.52
Wildlife and Habitat	*6.85*	**Social Values**	
Land/Soil/Trails	4.86	Family/Children	2.63
Air/Atmosphere	0.86	Fellowship/Bonding	0.40
Water	2.14	Cooperation/Compromise	1.54
Unique Areas/Features	2.77	Recreation	5.68
Human-center. Concerns	*10.34*	Patriotism	0.57
Environment/Earth	3.45	*Monetary Concerns*	*6.40*
Nature/Wilderness	5.42	**Emotions**	
Scarcity/Rareness	3.58	Anger/Disgust	4.55
Time		*Sadness/Fear/Distress*	*9.51*
Heritage	1.36	Hope/Optimism	0.64
Posterity	3.54	Pleased/Satisfied	3.37
The Present	0.86	Passion/Fervency	4.50

Similarly, passionate references to animals and their habitats were often expressed:

> *Imagine having a big business come into your home town destroying the places you know from playing on or experiencing as a child, teenager, young adult or elder. Having a bulldozer cut your home or school or park or church in half. So they could put in a sidewalk. That is what happens when a road goes thru a forest, animals, plants are destroyed, their communities, their feeding areas are altered forever. Put aside what we can get out of their existence. What about their existence? Nowhere is it written that man can do with the earth as he chooses.*

The importance of qualitative analyses of apparently clear-cut content categories such as this one is illustrated here. A simple measure of the frequency of comments about trees or animals would not reflect the depth of the meaning of such environmental features.

Human Centered Concerns. In passages coded with this category, writers focused on particular elements of the environment or of certain activities that have direct or indirect implications for human health and safety. This includes traffic safety and hazards, fire hazard, excessive noise, crime potential, vandalism, littering and trespass. Many of the human-centered concerns were expressed by owners of in-holdings or property adjacent to the Hoosier with respect to the effects that Forest users, projects and activities could have on their lifestyle and property.

> *The proposed area for this "Off Road Vehicle" course is shown to be directly adjacent to our property. If so, we are very concerned about the amount of traffic . . . which would be generated on the road from Waymansville to the Lutheran Lake area. This road already has had a*

Table 3. Outcome codes expressed as percentages of total number of letters (N=1237)

CODE CATEGORY	%
Off-Road Vehicle Use - For	27.32
Off-Road Vehicle Use - Against	30.23
Pro-Hunting	9.54
Wilderness Preservation - For	8.33
Wilderness Preservation — Against	4.37
Not in My Backyard	6.63
Timber Harvest - For	14.55
Timber Harvest - Against	29.83
Multiple Use	8.00
Mineral Leasing - For	0.73
Mineral Leasing - Against	18.76

> *number of accidents and if traffic is increased, and particularly if there is any possibility of alcohol use, this road can become one of the highest accident roads in this area.*

Many residents were upset about the prospect of increased or continued ORV presence near their properties:

> *We are concerned with the type of people that would use the trails because we have seen what most motorcycle gangs do to property. We are also very concerned about safety from fire started by sparks since our woodland joins the Hoosier National Forest on two sides, and we know what forest fires can do.*

References to motorcycle gangs, which may or may not be an accurate picture of ORV-users, were common in the letters. This may reflect direct experience, rumors, or it could be a strategic exaggeration. Nonetheless, strong fears and distress were frequently associated with ORV riders.

Venerable Sources. The citation of a venerable source was originally identified by Creighton (1983) as an indicator of underlying values and emotion. He suggested that citations of venerable sources are often employed as a means of bolstering the commenter's opinion and providing unimpeachable documentation for the position being espoused. As such, venerable sources provide insight into the writer's beliefs about appropriate standards for assessing land management decisions. In addition, we suggest that the citation of a venerable source indicates that the writer believes his or her own credibility to be insufficient to make a suitably forceful point. Thus, the presence of a venerable source may indicate the strength of the writerís convictions as well as the extent to which the writer expects to be ignored. Venerable sources were used consistently throughout the Hoosier letters and included such elements as laws, government documents, news articles, books, letters, individuals, and groups.

> *I am surprised that the State of Indiana could even consider sacrificing 11,000 acres of land for this type of use [off-road vehicles]. Theodore Roosevelt said "A nation is obligated to manage its resources for the greatest good of the greatest number over the long run." Does this plan really represent the majority of people in Indiana? Not only is this proposal short-sighted, it unjustly imposes the will of a small few upon all the residents of this state.*

This passage also illustrates another of Creighton's indicators of values and emotion, value-laden language. The references to the sacrifice of lands to ORV use and the imposition of the will of the few are expressed in forceful language that reveals the values of the writer. Thus land which is designated for ORV use is lost to this writer, and the act of providing for ORV use on public lands is unjust.

Personal Validation. The personal validation category was developed when it was noted that many writers made statements that justify subsequent comments and positions on issues. For example, a writer might indicate that he/she is a taxpayer, a landowner, or a long-term resident in an effort to give subsequent comments more weight.

This category reveals what the writer believes to be the criteria by which Forest Service officials will judge the importance of the comments in the letter. Similar to the citation of a venerable source, the use of personal validation frequently implies that the writer feels that his/her words must be given additional weight or validation in order to strengthen the commenter's position. There was a variety of ways in which writers accomplished this.

Perhaps the most common and innocuous personal validation device was identifying oneself, and this was usually done by providing age, name, and family position. Place of residence was also used to establish the writer's credentials. For example, one individual wrote that she was a native Hoosier currently residing in California who would soon return home. This probably indicates that she believed that the opinions of a California resident would be viewed as less important than those of an Indiana resident, and she identified herself accordingly. Other writers revealed that the proximity of their residence to the Hoosier or the length of their residence in Indiana are believed to be important weighting factors. The amount of money the individual (or group) spent either on activities and taxes related to public lands is also used to establish the writer's credentials. Other devices included relevant professional experience, personal or first-hand knowledge of the forest or forest issues, or the manner in which the writer uses public lands. Although it is

not possible to determine the extent to which these validation strategies work, this is an interesting question for future research.

Often commenters presented themselves as pillars of the community who had a stake in the outcome of the decision, and who had a valuable perspective to offer. They emphasized their position or status in the community to insure that their viewpoints would be given serious attention.

> *As a Taxpayer I require that the State and Federal Governments provide a legal and safe place for me to pursue my chosen Recreational Activity. I was a paratrooper in the United States Army, and I need the physically demanding sport of Dirt Biking. People gave their lives in wars so this would be a free country. What would they think if they knew that right here in Indiana good American Veterans are being denied a legal place to enjoy their country and their freedom?*

Moral Judgements/Moral Tone. The presence of this code indicated a judgement on the part of the respondent as to what is morally right or wrong or to what should or should not happen. Moral judgements were often associated with negative emotions and were characterized by strong or exaggerated language, sarcasm, rhetorical questions, name-calling, antagonism, and even threats. Thus, in the following example, the writer provides a wealth of insight into his/her interpersonal as well as environmental morals. Here we see that equal access to forests is a moral (or ethical) principle, that differing opinions should be respected, and that cutting trees is tantamount to immorality.

It nearly gags me, to read some of the narrow minded, nearsighted, and childish, reasons, some of these people have for denying, equal use of the forest, to those who differ with their opinion.

I call Indiana the state that hates trees, because in other states I don't see or hear of the massive cutting of the precious life giving forest.

Moral judgments were often accompanied by clear statements of the writer's sense of fairness and accompanied, as in the following quote, by references to heritage or posterity and personal sacrifice:

> *Just because they bought their playthings before they had a place to ride I am asked to sacrifice my safety, lifetime investments, and the heritage of generations to come.*

Morality is also reflected in the quote cited as an example of statements regarding wildlife above.

Destruction, Damage, and Scarcity. In passages coded with these categories, respondents discussed concepts of destruction and damage, such as how to avoid disturbance, the need to assess damages, and relative damages. Some things appeared to be more valued because of their perceived scarcity or rareness. That they could be lost forever concerned many writers, as in the following example:

> *I am vehemently opposed to the construction of ORV trails in Hoosier National Forest . . . It is unthinkable that the people of Indiana would allow such mechanical intrusion and degradation to occur to the Forest. Indiana is not exactly blessed with natural wonders compared to some other states; it would be a great shame to see something negative happen to one of Indiana's finest natural areas.*

These code categories also revealed underlying values:

> *The trails are damaged quickly and deeply. When a trail is obstructed, the ORV makes a new trail, increasing the destruction. The noise of ORVs destroys the value of these public lands for the overwhelming majority of people who are seeking a place of relative peace and quiet.*

Nature/Wilderness. Commenters often expressed their desire for an area to be kept in a natural or wild state. Oftentimes, as in the example below, the writers expressed a strong belief that the wilderness contributes to their sense of well-being.

> *I'd like to express to you the importance I place on having primitive wooded areas near to where I live. Knowing that they are mine to see and to spend time in gives me the encouragement to build toward a better life, for other people and for myself. My experience in the wild, however remote, has enriched beyond measure my own sense of place and time in this world. Taking away such a resource can have disastrous effects on the ability of people to achieve self-love and understanding and to relate to others.*

Emotion and preservation. Consistent with previous experimental studies (Vining, 1987, 1992b), qualitative analyses revealed that the wish to preserve wild or natural land was often accompanied by negative emotions. Sadness and fear were found more often than other emotions, and more often than most of the other content categories. These emotions were often expressed when the writer wanted to preserve the forest as it was.

> *We thought that the Hoosier National Forest Management Plan was to protect the Forest. Walking through the forest and looking at it I thought it would always be there. Now reading your Hoosier National Forestry Management Plan I would not be so sure.*

As in previous research, sadness and fear were also associated with the idea that natural beauty is gone forever once it is altered.

> *Surely you cannot be blinded to this mutilation of such beauty to total destruction, once destroyed never again to be the same. No amount of time will ever bring it back.*

Emotion and Motivation. Strong emotion during the public involvement process is often dismissed as irrational by land managers. This is perhaps understandable because the negative emotions are either directed at the manager or at his/her work, often causing a defensive reaction. An argument can be made, however, for the wisdom of listening carefully to strong emotion and attempting to understand its basis. Emotion plays a major role in motivation, and is an indicator of caring. The act of writing a letter itself would probably not occur without some level of emotion, and testimony at a public hearing, a daunting prospect for most, is undoubtedly motivated by the strongest emotions. An angry or sad passage in a letter may indicate the degree to which an individual cares about a particular issue. This must be interpreted carefully, however. Strong emotions are sometimes associated with relatively trivial events such as breaking a glass. Also, emotions may motivate an action, but fail to endure. The key is the expression of strongly-held values that underlie the emotion. In the following passage the writer used strong emotion to express values of family, solitude, and reverence for nature. In addition, deep disappointment that the agency values were apparently not in line with the writer's was expressed.

> *I used to find some solace in living surrounded by National Forest. It was peaceful and there was a certain beauty not found on a lot of woods. A person could walk for hours without seeing another person except for maybe during mushroom season. I always thought one day I would be able to enjoy these forests with my children. Now I have a 1 year old son and the Forests are being exploited. At least all the ones around where I grew up are. I can count at least 10 clearcuts within a mile radius from my home. And now the possibility of a Public cycle trail. Why concentrate all the destruction in one place? Maybe you feel that if you mess up just a few peoples solitude that would be better than having a bunch complaining. I can possibly see how some wild game could benefit from clear cuts. But then you defeat your purpose by allowing cycles [ORVs] to disrupt the wildlife habitat. This last issue of outdoor Indiana talks about the decline of grouse in the wake of mans exploitation of the Forests. In fact there was beginning to be a considerable increase in grouse in the pine Forest around here. Since these cycles have been around you don't jump near as many grouse, and I'm only talking about maybe 5 or 6 cycles a couple of times a weekend right now! Why isn't some of this timber money going to replant some of these clearcuts? Where does the money go?*

Discussion

The results of this study have the potential to inform public involvement and management processes. These results also raise important questions for further research that would inform our knowledge of human-environment interactions.

The eloquence and emotionality of the comments emerges clearly from the public comments. A deeper understanding of this type of content could help managers to comprehend and perhaps even empathize with the motivations underlying public responses to management plans and actions. What, then, can we offer the manager who wishes to understand public commentary in a deeper way? In order to begin to answer this question, we visited with representatives of the Hoosier National Forest on several different occasions after we developed the content taxonomy.

It is evident from this study and from our discussions with Hoosier National Forest managers that tabulating desired outcomes, or "vote-counting" is not sufficient to understand the public perspective. It must be realized, however, that National Forest offices have few resources to devote to analyses such as the ones we conducted here. Although most of the offices have individuals (usually just one) responsible for reviewing public commentary, there is generally little time or resources available for summarizing the input and systematically integrating it into management plans. Although our coding manual includes clear definitions and signals to the presence of content to be coded, it is not a practical tool for field use, and was not intended to be. What this study can offer is some insight into the nature of the values and emotions that are expressed as well as ideas for training activities that might assist managers to become more accepting of and attuned to this type of content. Certainly a coding scheme designed for managers to use would have to be a great deal simpler than the one we have generated.

Our meetings with Hoosier officials (and with officials of other forests in a different context; see Vining, 1992a and 1992b) revealed that most managers share the public reverence for nature and much of the emotionality that goes with it. Managers may experience emotional reactions, but operate in a milieu in which those reactions are not often expressed. Encouraging managers to empathize more with the public by recognizing their own emotions and values

could help in communication efforts. Given the degree to which land managers are socialized into an agency in which rational (i.e., non-emotional) process are emphasized, this may be a difficult prospect. However, it is encouraging to note that many of the managers with whom we worked on this project were willing to recognize the values and emotions that they share with the public. Theirs is a difficult job in which criticism seems to come from every corner: the suppression of emotions is understandable.

Many of the code categories that reflect values and emotions are relatively easy to detect in written commentary. For example, the *Personal Validation* and *Venerable Source* categories are easy to see, and offer insight into the assumptions of the writer regarding the credibility of his or her comments. Others, such as *Moral Judgments* or *Ethics* require a little more diligence to discover, but reveal a great deal about the basis for public perceptions and comments. References to environmental attributes are often expressed in terms of held as well as assigned values. This distinction is important, but not difficult to make, and certainly could form the basis for training activities which would sensitize officials to the presence of these factors in public comments.

The presence of emotion in public commentary is easy to detect for the most part. Creighton's (1983) indicators of emotion, the citation of a venerable source, predicting a dire consequence, and the use of value-laden language were readily apparent throughout this data set. These are useful when clear emotion references are absent. However, value-laden language is present so often that it is not a category with good discriminative validity.

A more problematic issue for the integration of emotional responses into public involvement interpretations, however, is that the importance and value of emotion is so frequently underestimated or even dismissed as irrational or irrelevant. As noted above, it is crucial that managers understand that emotion plays a vital role in communication and motivation, including their own. Emotion is frequently a signal that powerful underlying values are at stake. Barriers to the recognition and understanding of emotion are often found, however, in the rational management culture in which most forest management takes place as well as in our societal norms that discredit emotion. It is also vital for public officials to learn to recognize the rationality, or functional value of emotion. When so many National Forests are having difficulty gaining acceptance for their plans due to public outcry, the price for ignoring emotional and value-laden content in public commentary is very high.

The results of this study also have the potential to help understand basic interactions between humans and natural environments. The Hoosier letters were characterized by remarkably eloquent and passionate pleas for a variety of outcomes, accompanied by a wealth of data on rationales for these positions. One of the most important elements of these letters was the moral or ethical basis for conclusions about environmental management and a variety of rules for proper behavior and for proper judgments were found. For example, ideals of fairness were frequently evident in calls for multiple uses of forest lands, but were sometimes overridden by other rules such as "squatter's rights," or "we were here first."

With respect to values, our quantitative analyses showed that the expression of held values dominated assigned values. This may call into question the common use of research instruments in which assigned values predominate. At a minimum, such questions should be accompanied by items that enable respondents to offer their held values as well, and qualitative analyses should play a greater role in studies of values. We have begun to link the values identified in this and other qualitative data sets to a variety of established psychological value scales in order to inform this process.

Social relationships between managers and commenters were also evident in the Hoosier letters, most notably in terms of attempts by writers to reinforce their positions through the citation of venerable sources or through attempts at personal validation. These results clearly illustrate the assumption of many writers that without some type of bolstering, their comments might fall on deaf ears. This data set offers enormous potential for examining the coded content that co-occurs when these validation attempts are present, a possibility that has ramifications for the study of social cognition as well as for management.

Consistent with other research (Dwyer et al., 1990; Schroeder, 1992), the deep importance of natural environments emerges clearly in this study. The meaning and significance of places was described with great poignancy by a number of writers. There is great potential to use this data set and others like it to understand how the meaning of nature is constructed as well as to examine respondents' senses of place.

Previous studies have indicated that negative emotions, preservation decisions, resource scarcity, and conflict between users are linked (Vining, 1987, 1992a; Vining and Schroeder, 1987). Our analyses found some support for this association, at least in terms of the frequency with which such elements are noted by commenters. Additional analyses will examine more directly the co-occurrence of negative and positive emotions with values and outcomes.

There are many other analyses that can and should be performed with the coded data. There are exploratory analyses that can be conducted as well as the testing of many hypotheses regarding relationships among values, emotions, and desired outcomes. Another logical extension of the process of understanding the bases for public comments on

land management options would be to repeat our analytic process in the context of a different forest planning process, perhaps in a National Forest with different environmental, social, and planning characteristics than the Hoosier. Such an analysis of comments from a forest with fewer inholdings, different use conflicts, and perhaps less population pressure would possibly result in the emergence of some different codes, but surely some overlap as well. Ultimately, the taxonomy developed here could be adapted into a standardized model for use by U.S. Forest Service units and other agencies interested in pursuing content analysis of public comments. Such a tool could be valuable in assessing large bodies of textual data without losing the important elements of value and emotion. If the values and emotions of the public can remain part of the picture throughout the process, then perhaps a better understanding of the public's needs can be achieved and improved decisions can follow.

Endnotes

1. This time period may seem excessive, but it has proven difficult for National Forests to successfully implement plans at all due in part to extensive public comment and litigation on Environmental Impact Statements. The Hoosier is one of only a few Forests that have been able to revise and implement a plan.
2. Inter-coder agreement was established on one letter at a time. Reliability coefficients in the lower end of the range tended to occur when the first few sets of letters that were coded, with increasing levels of agreement over time. It is reasonable to assume that the .69 mean coefficient is a conservative estimate of inter-coder reliability.

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