THE DEVELOPMENT OF NATURAL RESOURCE VALUES:
FEDERAL NATURAL RESOURCE MANAGERS IN HUMBOLDT COUNTY

by

Jessica Ann Lucia Birnbaum

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ABSTRACT

The Development of Natural Resource Values: Examining Federal Natural Resource Managers in Humboldt County

Jessica Ann Lucia Birnbaum

The multifaceted problems associated with natural resource management are often fraught with the difficulty of communicating goals effectively and balancing the various goals of each constituent involved with the resource. Just as values are central to understanding people and their relationships to the environment, values are central to understanding the basis for managerial decisions. In order to investigate influences on development of natural resource values, this research explores how experiences with the natural world shape one’s values. The study participants work within the field of federal natural resource management in Humboldt County. Semi-structured interviews with open-ended questions and surveys were used to gather data. Participants were found to have had similar environmental experiences that affected the development of their environmental worldviews. Childhood outdoor experiences near and away from home, both alone and with others; environmental degradation; family; and job experiences were found to be the most common influences.
ACKNOWLEDGEMENTS

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INTRODUCTION

The meaning of natural resources relies upon an understanding of the reciprocal relationship between humanity and the biophysical environment. Without humans, natural resources are simply forests, not places for extraction of timber, a hike or a place to investigate scientific theories. The meaning is socially constructed. Thus, a thorough study of natural resource issues involves the investigation of the social issues surrounding particular natural resource views. An interdisciplinary approach was used to examine the human dimensions of natural resource management, specifically how a person’s personal and professional experiences with nature influence their values about the natural environment. Because resource management issues are human problems, they necessitate a combining of knowledge that draws from the social sciences as well as the natural sciences (Lee et al., 1990). Conflicts over resource management cannot be solved through science alone. The integration of a stakeholder’s particular valuation of the natural environment, whereby increased attention is given to individual ecological worldviews in natural resource conflict management, is presented as the framework for anchoring decision-making within a particular context. Because ecological worldviews are often founded on common nature experiences, natural resources managers can recognize that interests are related and can then focus on overlapping goals.

Natural resource management decision processes are among the most challenging facing humanity because of the intersection of several decision attributes, such as
complexity, uncertain and conflicting values, incomplete and uncertain knowledge, long
time horizons, high stakes, multi-scale management, linkages among decisions, and time
pressure (Brewer and Stern, 2005). Generalizations are not as appropriate for natural
resource management issues as they may be for physical science explorations since
human behavior is so variable and embedded in social context (Denzin and Lincoln,
approach to environmental problems in that those problems and their solutions are seen
as inextricably linked to social, political, and economic issues” (Shutkin, 2000:22). My
study examined experiences and information harvested at common types of natural places
that affect the development of one’s ecological identity. Ecological identity refers to how
people perceive themselves in reference to nature and their developmental relationship
with nature.

In order to investigate the influences on development of an ecological identity, I
concentrated on how experiences shape one’s values to perceive the natural world as part
of one’s community or as an assemblage of commodities. The particular environmental
or natural resource values held by people have been addressed in research studies. The
development of such values, on the other hand, has not been as thoroughly examined.
The social meaning of nature has been explained, but not many studies have been
devoted to exploring how the construction took place. Constructivist grounded theory
was used to analyze the interview data. Constructivist methods rely on how participants’
meanings are created from shared experience and developed in context, which is in
contrast to objectivist grounded theory, by which data are thought to represent objective facts (Gubrium and Holstein, 2002).

Values are shaped by the formative influences of experience, learning, and culture (Kellert, 1996). Various outdoor experiences are strong determinants of the degree to which a person develops an attachment to or an appreciation for aspects of the natural world. The focus of the current research is on, as Denzin (1994) put it, life experiences that alter and shape the meanings people assign to natural resources. While there has been discussion in the literature regarding the relative importance of each type of experience, there is still much uncertainty. In the literature there is a concentration on the possible greater effect of direct experience. It is important to experience nature through all five senses (Clayton and Opotow, 2003).

Thomashow (1996) described how experiences shape values. He used the direct experience of nature as a framework for understanding personal decisions and professional choices. He teaches groups of employees how to implement reflective, introspective analysis. His participants are instructed to contemplate their experience with nature and then reflect on, discuss, and internalize the personal and public impact of their environmental experiences. It is through the collective exploration of environmental identities that Thomashow assists stakeholders to improve their abilities to come to amicable solutions. As stated in the *Handbook for Interview Research*, telling a life story makes the implicit, explicit (Gubrium and Holstein, 2002). The process of value formation is difficult to articulate especially when the values include those that are not
easily categorized, such as a general appreciation for the natural world rather than valuing natural resources as commodities or for their recreational worth.

Thomashow found that there is a dynamic relationship between intellectual concepts of environmentalism and the memories and life experiences that validate them. He found three primary ways that people describe their experiences with nature: memories of childhood places, the perception of disturbed places, and the contemplation of wild places. All of these are viewed as transformational events in people’s lives. My thesis largely relied upon Thomashow’s three categories of experiences with nature to aid analysis of participants’ experiences.

Bullis and Kennedy (1991) cited the importance of acknowledging underlying values to enable stakeholders to better understand the long-term effects of their decisions. Nevertheless, values are normally ignored during decision-making processes, due to the assumption that decision-making is a purely rational process and therefore values should not be involved. However, “…values are the overarching criteria people use to make decisions” (Bullis and Kennedy, 1991: 543). As stated earlier, decision making is as much an issue of subjective perceptions as it is a matter of objective forces (Murch, 1974; Tuan, 1974).

In order to address identity-based impediments to effective natural resource management it is vital to develop an overarching group identity, such as preservers of open space. The Quincy Library Group is a good example of stereotypical adversaries bridging their difference for a common goal. The backgrounds of the team of partners in
1992 included, a Republican who supported the timber industry, a forester, and a self-proclaimed “environmental wacko” attorney based in Quincy, California. The Quincy Library Group was able to establish the common ground of retaining the rural quality of life, such as enjoying beautiful views, hunting, fishing, swimming in local rivers that they all valued dearly. Specifically, both environmentalists and loggers were against clear-cutting but for different reasons. For environmentalists, it was an issue of ecological health and visual aesthetics; loggers opposed it because such harvest practices rely on lower-skilled and more automated logging practices, thereby restricting the number of jobs available for each timber sale. There may be shared goals beyond the current conflict, such as a broader look at the future of a community, including both the environment and the economy. Accordingly, it may be useful to identify a superordinate or overarching goal (Wondolleck and Yaffee, 2000).

The practical application of the current study is to enable more collaborative involvement instead of consistent disregard for perspectives of others; to help stakeholders take the attitude of the other, enabling them to understand empathetically the complex and deeply rooted values that determine a person’s ecological identity. Based on the literature, those involved with natural resource debates all likely had experiences relating to the outdoors that aided the formation of their ecological values (Bixler et al., 2002).

By relying more upon a likely underlying common connection to the natural world that developed through experiences, federal natural resource managers may be
better able to communicate effectively with various stakeholders who also developed their environmental sentiments through outdoor contacts, especially with those who have differing viewpoints. If one evaluates the basis for his or her own values, it can result in greater insight into the validity and reasoning behind the values of others (Berg, 2004). The current study was meant to be useful for the participants. One of the main goals of action research is to enlighten and empower; managers may be motivated to take up and use the information gathered to make better decisions.
METHODS

Data were collected through interviews and survey research. The conceptual framework utilized explored the possibility that those with differing ecological identities may differ in their worldviews but have had similar experiences with the natural world that led to their most fundamental connection to the natural world. This project can be termed action research since the approach embraces participation and reflection for those wanting to improve their situation. Interviewees may simply benefit from the process of discussing experiences, since one way people can keep memories, experiences, and collective values alive is by telling others about them (Gubrium and Holstein, 2002).

While I desired to investigate the value formation of a variety of people involved in natural resource management, time and money constraints necessitated choosing a particular population. I chose to use employees of the Bureau of Land Management, the Fish and Wildlife Service and the USDA Forest Service in Arcata, California as my study population (Human Subject Log Number 04-72, April 5, 2006-7). The working population was thus geographically defined since the geographic parameters provide the context in which to analyze the particular significance of results and their applicability. Agency employees were chosen as the study population because they were involved in balancing the interests of many stakeholders and making management decisions that affect many people. Also, it has been proposed that environmental professionals likely have had experiences that led them to choose to work in the discipline (Peterson and
Hungerford, 1981). The decision to use federal agency employees as the study population was also based on my member-based knowledge, since I have been an employee both of the Bureau of Land Management and the U.S. Forest Service. My advantaged access could have allowed me to see the nuances and layered meanings behind the responses of the agency employees interviewed.

Methods were developed with the intent to achieve depth rather than breadth. I wanted to gain insight into the range of experiences and value formation processes, not to determine the extent to which such experiences and values were distributed among federal natural resource managers. I concentrated on substantive importance, not methodological precision. As a result, sampling techniques were purposive rather than random, in order to ensure a varied set of perspectives. The participants were chosen with an attempt to interview people with varying job descriptions and government grade levels. Snowball sampling, whereby participants were asked to suggest someone within the agencies who they thought has a different perspective on natural resources than them, or has had different experiences relating to the natural world, was used.

Triangulation of research methods was employed. Both qualitative and quantitative data were collected to validate findings, strengthen conceptual linkages, and increase my understanding. The interview is the oldest and simplest method of learning a person’s values; it allows the researcher/interviewer to follow up initial questions, seek clarification, pursue interesting comments, and distinctively learn something of the strength or importance of each value (Kilby, 1993). Qualitative research has much to
offer a field affected by stakeholders’ abilities to communicate effectively (Johnson and Waterfield, 2004). It has very high validity because it allows for one to clarify exactly what the participant means when they talk about experiences rather than having to fit an experience into a pre-constructed set of check boxes (Babbie, 2004). The qualitative method employed was similar to that used by LaChappelle et al. (2003) in which data were collected by in-depth personal interviews in order to investigate barriers to natural resource planning. The responses to the survey that I administered at the end of the interview provided quantitative data that served to augment and inform the interview data and help determine a participant’s particular ecological worldview. Both types of interview were used in order to expose different aspects of reality and increase understanding (Lund, 2005).

Qualitative data were collected through semi-structured interviews with open-ended questions that enabled interviewees to describe life experiences and values in their own words. A brief, yet careful, explanation of my research was given to each participant at the beginning of the interview so that they would know why they should allow me access to their lives, minds, and emotions (Lofland and Lofland, 1995: 41). A face sheet soliciting respondents’ gender, race, age, profession, and childhood residence was employed to provide basic attribute data and to ease the participant into the interview process by asking simple questions. The interview guide was based on the Handbook for Interview Research (Gubrium and Holstein, 2002) and was developed to make the interviews systematic and focused. Questions focused on those influential experiences
identified in my literature review. The guide (Appendix A) consisted of open-ended questions exploring the experiences that each participant may have had that could be relevant to the development of their ecological worldview.

Interviews were tape recorded to ensure the validity of my data since a human being’s memory does not remember verbatim, but organizes what she thought she heard based on experience (Gubrium and Holstein, 2002). Also, by tape recording I was able to concentrate more fully on what was being said and to actively reflect during the interview to enable me to ask appropriate probing questions. Further, I was able to establish reciprocity by sharing some of my own experiences and reflections with regard to the formation of my own ecological worldview. Presumably, through sharing my views, the participant became more comfortable and eager to share as she finds herself playing the role of collaborative partner (Gubrium and Holstein, 2002). Interviews were transcribed verbatim and constituted the bulk of the empirical foundation of this study.

Initially, six preliminary interviews were conducted to determine how to carry out the interview process, including what questions to ask and how to construct the survey. Final interviews were conducted until theoretical saturation was achieved: that is when no new information was presented by interviewees.

Analysis of the qualitative data consisted of thematic analysis and code development. Because the interviews were transcribed in full, I was able to perform textual analysis to explore the common themes through content analysis that led to coding the data. The software package NVivo was used for data management, such as
coding, to find common variables within each interview transcript. Specifically, the
codes help to develop categories of experiences that can then be organized within the
conceptual framework of the study to test empirically whether there exists similarity in
experiences among the participants and whether these correlate to a development of a
different ecological value orientation.

The preliminary interview results guided the development of the final interview
and survey questions. The interview guide was adjusted to address initial findings from
the preliminary interviews. For example, for most preliminary interview participants one
particular place stood out in their memories of environmental experiences, which is why
that was addressed at the onset of the interview.

Specific environmental experience variables were explored based on findings
from the literature review on significant life experiences that affect a person’s
environmental worldview and backed up by preliminary interviews. These included
extensive time spent outdoors as a child, destruction of environment with which the
participant had direct contact, parents or other family members, teachers or classes,
involvement in environmental organizations, and books (Chawla, 1999; Wells and
Lekies, 2006; Ewert et al., 2000). In addition, the interview questions explored other
possible types of influential experience. Some concentration was placed on childhood
experiences, usually ones that occurred before the age of 14, because they have been
highly ranked by participants in previous surveys of significant life experiences that
determine degree of environmental sensitivity (Thomashow, 1996). Moreover, it has
been found that environmental concern may lie in young children’s initial fusion of their own feelings with their sensations of the world (Chawla, 1995).

The written survey questions administered following the interview served to solicit a quantitative impression of the environmental experiences and ecological worldview the participant possesses and the possible association between experiences and ecological values. Survey responses were anonymous. Using an anonymous survey, one can obtain data that would not be revealed in the face-to-face interview process where the participant may feel uncomfortable being fully honest. The survey data also provided an empirical representation of findings that could be subjected to statistical analysis. Environmental value orientations were explored by a set of questions I developed, drawing from the literature to determine which questions would be appropriate (Appendix B). Each item represents a particular viewpoint and collectively the pool of items encompasses all the factors thought to determine a person’s ecological value orientation. Each participant was asked to indicate the degree of his or her agreement or disagreement with each statement on a Likert scale. The survey uses a Likert scale multiple-choice format in order to distinguish among degrees of agreement on a range of experiences and values relating to natural resources.

The software package SPSS (Statistical Package for the Social Sciences) version 15.0.1 was used to analyze the data to produce frequencies and cross-tabulations to determine if there were any correlations between experiences and values. Each survey response was assigned a number relating to level of agreement. For example, if a person
circles ‘often’ in response to question 1, the response was assigned 4, as that is the fourth option. If a person does not answer a question, it was assigned 9. Frequencies of each response to survey questions were translated into percentages of the total sample population to obtain the importance of each influence or value. The first sets of questions, under the heading “Influences,” were treated as the independent variables, with the questions under the heading ”Philosophy” used to define a person’s ecological worldview and were treated as the dependent variables. Cross-tabulations between influence and philosophy questions were used to determine the possible correlation between experiences and resultant values. Because the data were ordinal, gamma was used to measure whether the correlations were statistically significant (Kirkpatrick, 2001).
RESULTS

In all, 48 federal agency employees were interviewed: 12 people from the Bureau of Land Management (Arcata, CA), 16 from the US Fish and Wildlife Service (Arcata, CA), and 20 from the USDA Forest Service (10 working in Eureka, one in the Trinity Ranger district, five in the Orleans Ranger District and four in the Mad River district). Positions in agencies ranged from technician positions such as fish biologists and forest ecologist, managerial positions such as planning and environmental coordinator and resource planner, and supervisory positions such as forest supervisor and field supervisor. In all, the database constituted more than 30 hours of taped interviews. The participants ranged in age from 26 to 61, with a mean age of 42. Time spent working at agency ranged from 3 months to 20 years.

Value Sources

From the preliminary interviews I found three types of experiences to be most pivotal and common: Areas where the person grew up, family members, and the destruction of natural resources with which the person had direct contact. One interesting story was told by Adam, “We went water-skiing at a lake that they nicknamed “Jug lake” because there were plastic milk jugs all lining the shore. I mean they had a boy scout clean up and got 200 bags of trash after 20 yards or so of the shoreline.” Adam
mentioned that as a result of that experience he felt a greater desire to work to make sure that natural areas were better managed.

Bruce also mentioned the area around his childhood home with great enthusiasm. He spoke of his brother bringing home snakes and turtles. Despite the fact that he grew up in Livonia, a very dense suburb of Detroit that was pretty well paved over, he could still catch things in creeks. So, as he said, “just being a kid, catching frogs and turtles was totally intriguing and now I’m trying to get paid to do it.” Frank also spoke of how the less urban setting of his childhood environs allowed him to develop greater respect for the natural world.

David missed his childhood playground, the orchards around San Jose, when they were paved over to build housing developments. Frank posited that by being a part of some of the most destructive types of timber harvesting and then learning that what he had been doing for ten years was illegal, was, as he termed it, a “watershed event,” in terms of shaping his value system. It affected him to such a degree that he came to absolutely despise logging for a while. As Frank said, “I’ve seen and participated in the worst of the worst and now I have seen what I consider to be the best of the best in terms of forestry practices. There have been a number of evolutions in my thinking about this.”

Occupations, education, and wild places were more guiding experiences rather than distinctly pivotal. In Bruce’s case, he was not so much influenced by his job, but by one of his former bosses. Just being around his boss, Bruce got a sense of a wilderness ethic, developed a sense of place, and became intrigued by nature writers. As Bruce said
of the boss, “He turned me onto Gary Snyder and I think it sometimes takes writers like Edward Abbey to piss you off and Gary Snyder to give you sense of what is important, Leopold to bring you closer to the land. Thoreau was talking about land ethics 100 some years ago, gives you a sense of time and how it’s always been important.”

**Childhood Outdoor Experiences**

All but two of the participants (46 of 48) said that engaging in outdoor activities as a child, either near or away from home, influenced the way they perceive and value the natural environment. According to Tina, “For me it was the critters, salmon, frogs. Giving the kids a sense that they are part of the earth, not dominant on the earth. Getting out into it is important.” Similarly stated by Brian, “Just being outside. I think you can always read up and talk to people about it…You have to experience it for yourself and see what nature means to you.”

Thirty-eight out of 48 (79 percent) mentioned near home experiences. Free play as opposed to structured play was cited as influential among the participants. As noted by Nancy,

Where I grew up was fairly rural, backed up to Jackson State Forest. A small bit of paradise, having a lot of freedom to roam as a child. I think that that partly developed my personal ethos. When I was like three I got lost in the meadow. The grasses were over my head. My mom had to tie bells on my shoes to locate me through the grass. I remember looking up and seeing the tops of the grass.
Again, 38 out of the 48 participants (79 percent) of participants mentioned formative experiences away from home. “But basically it’s about experience, the tree in the park, or the half-dome” (Nancy).

One day when I was about 10 we rode into the Appalachian mountains and they had lots for sale. We bought two of them. Now it’s called the Pocono’s. At the time it was completely undeveloped. We went up there every weekend. My mother would pack an ice chest of sandwiches. To my parents it was a wild place. I thought it was great, to get out the city, being around animals and trees. Built a cabin by hand, my father had a book. That was how it started I guess. I could tell that people loved nature, but maybe were cut off from it because of their birth and that was me. I had to get out of that place. (Theresa)

Overall, most of the experiences (77 percent) were with others. As cited by Owen, “A lot of it is going out and experiencing it. I have seen things on TV that are neat, but I relate to those things differently if I have a shared experience, then it’s really cool.” Similarly Ingrid commented upon the importance of having a shared experience as a means to intensify its impact,

If you lived your whole life in a city and never knew about connecting to the mountains and the trees I think it would really difficult to respect and honor that, it would be too abstract. I think if you are lucky enough to experience something with someone who is genuinely excited; it’s hard not to get excited too.

Boy Scouts was a prevalent influence among the participants citing the group as being influential in development of their perspectives towards the natural environment.

Troop leader was influential in fostering my environmental ethics. My scout leader. We were on a hike in the Cascades. Many of us had taken off in the morning and some of us had done our morning duties off in the
woods and he laid into us. I never forgot that. I was probably 14, that was a wake up call. (Henry)

Most colorful of all were Alexa’s ideas:

Have to get out in it. You can’t get it from reading a textbook or watching a movie. It’s best if you share it, if maybe you are with someone you love, like for example my dad taking me out to nature. It’s almost like someone taking you to their church, it’s almost like they have to get indoctrinated. They need a shepherd to take them into nature and then they have those positive experiences in nature and before you know it, they are bonding, creating a relationship and a desire for stewardship. You can’t have a relationship with it unless you go out and get to know it.

However, many participants also have vivid memories of being outside alone as children. “Just being out there, just sit down and that is all you do. Just observe. Sit in your backyard and watch the birds go through” (Larry).

The survey data further supported childhood outdoor experiences as a common influence, being one of the two main influences based on the survey data. All participants have at least some positive memories of spending time outdoors by themselves. Eighty-one percent of participants have fairly vivid positive memories of often spending time outside by themselves during childhood, 16 percent of them sometimes doing so, and the rest rarely doing so. The greatest number of people, 82 percent, often spent time alone outside and agree that they value natural resources aesthetically. As more time was spent alone outside, often as opposed to sometimes, there is a higher proportion of people that appreciate the aesthetics of natural resources.
Environmental Degradation

Having a valued natural environment be degraded was mentioned by 33/48 (69 percent) of the participants as an influence on their environmental orientation. Most of the areas were those that had been often enjoyed when the participant was a child.

A lot of the orchards were being turned into housing developments. I missed my playground getting paved over. (David)

There was a booming fishing community and by the time I was eleven there was nothing. It was probably in fifth grade, my parents took me out of school so I could listen to the offshore drilling hearings. It was huge, they were going to drill off the coast of California. I got to listen to a day of it. That was definitely a big turning point, listening to the political process. (Nancy)

One of the most amazing things was just hearing the call of the loons and they were starting to disappear because we had acid rain issues. Fisheries were dying, so the loons were not as prevalent. To think that your environment was dying on you as a teen that was what got me going. (Kim)

I lived in Fortuna where the Headwaters had not been logged, it was absolute old-growth, I mean primeval. I used to go up and play in there when I was really little. I never did like the devastation that logging had done, always noticed that even as a little kid that it was brutal to a landscape, so that was my first awareness of how we fit into the world. (Janice)

Family

Family was found to be a prevalent factor in the development of many participants’ ecological worldviews. Family was mentioned as influential by 34 of 48 (71 percent) of participants.

I really remember enjoying the experience (camping). Get up at 4am, sleep as we drove, dreamlike experience, wake up pulling into
a campground, all the different smells, surreal aspect. I think that certainly could have contributed to my appreciation for being in the wild, and my eagerness to go backpacking with friends later in life (Frank)

They definitely said not to poach, they never lectured us not to litter. A lot of those things weren’t said I just picked them up from their behavior, it was just assumed. (Fred)

In particular, fathers were found to play a large role through being part of a family activity or solely with the participant as a child. Thirty participants (63 percent) mentioned their dads as being influential on the development of their natural resource values.

My father throughout my childhood he would take me out on Saturday morning drives above the clouds, point out the flowers and all the natural things. This was before when we lived in the city. Each weekend we would go somewhere natural. When we moved to Felton we had five acres, so pastures and trees, native flowers. Our own nature to take care of on a day to day basis. So, the stewardship and caring really came from my dad and nature, originally. (Alexa)

I remember a friend of mine shooting birds with a bb gun and my dad made it very clear that that was never to be done. So, that influenced me early on, that hey, that wasn’t something you do. (Henry)

Probably the biggest influence early on was my dad. Even though I grew up in LA and my dad had also, we were not city people. We would get out and go backpacking, kayaking, every weekend we would be going outside doing something. (Matthew)

Survey data exhibit an association among the values of the participants, their parents, and their siblings, suggesting that family is a prevalent influence on the development of natural resource values. Participants’ ecological worldviews are similar to their parents,
valuing natural resources from both an ecocentric as well as an anthropocentric perspective. Most participants felt that their parents value natural resources both for aesthetic value and for their value as commodities. However, the survey exhibited a greater adherence to aesthetic qualities; 79 percent agreed that their parents value natural resources for their aesthetic qualities, while 56 percent agreed that their parents value natural resources for their value as commodities. With 56 percent also agreeing that their siblings value natural resources similarly, this finding supports the notion that the values of the family have an effect on the development of a child’s ecological identity. Additional support for family being an influence on ecological identity is shown by 56 percent of participants agreeing that their values regarding natural resources are similar to their parents.

All of the participants did outside activities (e.g. hiking, camping) with their family at least occasionally. Eighty-two percent had such experiences growing up either sometimes or often. An expected correlation was found between family spending time together and thereby having similar values develop. A connection was also found between siblings valuing natural resources similarly and those families engaging in outdoor activities. Similarly, the greatest numbers of people who agreed that their values are similar to their parents are those who often did outside activities with family. More family outdoor activities as a child, “often” as opposed to “sometimes,” corresponded to a higher proportion of participants valuing natural resources for their aesthetic qualities. A correlation was found between parents and participants valuing natural resources
aesthetically. As evidenced by the values in Table 2 being concentrated in the upper left corner, participants having a stronger aesthetic appreciation for natural resources correlates to their parents having a similar degree of aesthetic appreciation.
Table 1. Correlation counts between participant and his or her parents valuing natural resources aesthetically, from a natural resources values survey administered to federal land and resource managers in Humboldt County, CA, 2006-07.

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<td>Total</td>
<td>23</td>
<td>19</td>
<td>1</td>
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The correlation was significant \((p \leq 0.001)\), indicating a strong positive correlation \((\gamma = 0.76)\) between the variables, supporting the idea that parents have a strong effect upon the development of their child’s aesthetic appreciation for natural resources.

The greatest number of participants, 59 percent, agreed that their values are similar to their parents and either “sometimes” or “often” did outdoor activities with their family. Correspondingly, 59 percent of participants strongly agreed that they and their parents value natural resources for aesthetic qualities. Similarly, a correlation \((\gamma = 0.51; p \leq 0.001)\) was also found between both the participants and their parents viewing natural resources as commodities. Forty-five percent agreed that they and their parents view some natural resources as commodities. These results support the idea that the values of parents have a direct correspondence to the development of their children’s natural resource values.

As frequency of outdoor family activities increased, a greater proportion of participants valued natural resources aesthetically. The greatest proportion of participants (27.3 percent) “often” did outside activities with family and strongly agree that they value natural resources for aesthetic value. Additional support for family activities having an effect upon ecological identity is shown through 55 percent of participants agreeing that their siblings value natural resources similarly and growing up they did outside activities as a family.
Job Experiences

Job experiences were often mentioned 31 out of 48 (65 percent) as having had an impact on a person’s perspective on natural resources. Henry, who is now an ecologist for the BLM, developed his appreciation for the land while working it:

I spent a lot my childhood by myself working on trails, I always thought that was where I developed my interest in nature. I have a lot of fond memories of working on those trails. I would sit and listen to the birds. Looking at the plants and stuff, I have good memories of that.

Frank’s work for the Forest Service caused a dramatic shift in how he conceptualizes natural resources:

Definitely, the ten years I spent timber cruising for the Forest Service was very instrumental in my recognition of what the impacts of timber harvesting are, I got tremendous education out of that, economics, way federal government approaches that, loggers’ side, involved from layout to cruising to marking to administration to burning to even sometimes replanting. I’ve seen and participated in the worst of the worst and now I have seen what I consider to be the best of the best in terms of forestry practices. There have been a number of evolutions in my thinking about this. That was probably a watershed event.

Our district was in the textbook for overgrazing, I’m definitely anti cow. At least needs to be reduced. That shaped my views, but I got along with most of the people. More golf courses there than anywhere else and it’s in a desert. They do stuff that is totally illogical and not conservation minded at all. So, that’s why I didn’t like it there. (Fred)

Backcountry experience with the CCC changed my life when I was about 20...emotionally set me up with backup that the natural world is not a scary place. When I got back I remember just thinking I wasn’t the same person I was when I left. (Grace)
I worked for the Forest Service, trying to get black people from inner cities, out. I remember this one woman, I will never forget her, she made such an impression on me. She was afraid to go outside at night, she was concerned there were no street lights at night. It was so tragic to me, I don’t think I will ever get over that initial realization that there are many people who grow up that way. (Kelly)

I was a research technician going around to different streams all over northern California mapping sections of streams, mapping where fish selected to be. Measure things about their microhabitat. That was so exciting. After that I sort of stopped fishing. (Peter)

Job experiences were found to be a common influence on participants’ perspective on natural resources. Specifically, job experiences were found to affect the degree to which a participant values natural resources for their aesthetic value and where they place humans within the species hierarchy. Job experiences caused 72 percent of participants to change the way in which they value natural resources. Of those, 67 percent agreed that it gave them an increased appreciation for the aesthetic value of natural resources. In support of the earlier conclusion that working as an environmental manager one is influenced to view natural resources as commodities, the greatest number of people agreed that they view natural resources as commodities and had job experiences affect perspective. While participants were not asked whether job experiences increased their tendency to view natural resources as commodities, cross-tabulation counts showed 45 percent of participants felt their job experiences have affected their perspective on natural resources and view some natural resources as commodities.
Literature

Environmental books or magazines were cited by 16 participants as having an impact upon their perspective on natural resources. Edward Abbey, John Muir, Rachel Carson and Gary Snyder were most commonly mentioned:

Reading Edward Abbey, that was the kind of stuff that was really making an impression on, as far as what I believed in, helped form land ethics. (Bruce)

I remember J.F. Bach, guy who wrote Jonathan Livingston Seagull, the one after that. It talked a lot about people’s interactions with nature. That book made me realize that people are part of nature. That really affected me a lot, I thought yeah, that’s true, we’re animals. (Larry)

A book about pesticides. *Time to Kill, or Time to Die*, about how horrible effects of pesticides on animals, how they used to do aerial drops to kill coyotes. It was one of the first environmental books that I ever read, I was probably 15. I picked it up at a library, the title caught my eye. It had a huge impact on me, it was devastating, the indiscriminate slaughter of all things for just to kill a coyote, which I never had a problem with, something like a coyote that I never had an issue with, they were around the house growing up and I thought they were kind of cool. I would tell my dad the coyotes are good they eat the rabbits. (Kelly)

Travel

Travel affected the development of 20 of the participants’ ecological perspectives. Travel often was experienced simply through the context of a person’s family moving to a different area.

I went to school in Fort Bragg, which was a mill town, and lived in Mendocino, which was more of the rich hippies. It feels funny saying that, the blue collar community versus the educated community. They both have valid points, what’s interesting coming
from both of those, I really believe in a working landscape. I think we should be using our landscape for production, it’s just always a question of scale. (Nancy)

Travel was also influential beyond childhood, when the participant moved around as an adult. In Ian’s case, as in the case of many participants, it was through work that he was able to travel and live in different environments:

Moved to the south, worked all over there, there’s an entirely different attitude there. It is not comfortable to have the landscape in its natural condition, it’s hard, hard country. Everything has a point on it, gives you a rash, burns you, rots you. There’s a reason why those people chopped it down, dozed it over, planted cotton. (Ian)

I was a conservationist until I got hit smack dab in the face with survival, you don’t experience that here. That made me take 10 steps back. In a place like Kenya where the population doubles every 10 years because of no birth control. We’ve got to find a way to make it work for everyone, we can’t come in from the outside and try to regulate, it won’t work. (Ingrid)

Teacher

Influential teachers were discussed by 20 participants as having altered their ecological worldview:

I can actually tell you a time and a place when I knew I was going to work in natural resources. In 8th grade, a science teacher, the subject matter was photosynthesis and for whatever reason for me to become aware that a cell of a plant could generate energy really was the moment when I began to see the forest in a whole different way. It was that science class and photosynthesis in particular that really captured my interest and I have never looked back after that. (Brad)

This guy who taught biology, he taught invertebrate zoology. He was so fascinated by just the sponges and stuff, so it really opened my mind. The initial thinking about biodiversity; that was pretty mind expanding to take that class. I took an ecology course that
bordered on philosophy that was real mind expanding. You read Aldo Leopold, blending all the scientific stuff you do that really put me on the course I’m on, really inspirational. You get energy from that, not like taking a test. (Peter)

A teacher in 7th grade, really influential about the outdoors. Brought about the other issues such as pollution, issues that at that time were not that big. Not controversial as now. My mother has in a photo album a picture of me dressed up for a Save the Earth march. (Dan)

The other possible influences explored-- influencing others, having values diverge from peers, childhood media, employers, and subject matter at school-- were all mentioned by less than half of the participants.

**Conflict**

Participants were asked what sorts of conflicts they get into when they are trying to manage the natural resources they are in charge of; many of them made quite pertinent comments about how they navigate that difficult arena. Many people commented on how the decisions they make are not solely based on science, and how they must balance the needs of the public as well as use their professional judgment.

We need to frequently explain what we were thinking, collaborate, make adjustment. It’s not all about science directing what we do. It’d be pretty clean, I’d have a few less challenges if it was strictly science, but it’s not. Because the national forests are owned by the public and there are different social values that need to come from the forests. It goes both ways, any new information I get is affecting me. To understand more of the social perspective from people’s point of view. I think it’s a mutual growing of understanding and appreciation for the environment. (Neal)

It was often stated that conflict is often a matter of stakeholders being stuck in their position, often with little regard for what is truly best for the resource. As Virginia
commented, “I get angry sometimes because they’re not thinking about what’s best
necessarily, they’re just thinking of what their stance is.”

I’m not sure it’s about fisheries anymore. I think it’s more about defining
the fight and that’s hard to deal with because you think you share the same
values and yet you seem so far apart sometimes. There seems to be more
and more polarization and less and less dialogue. At some point that’s not
productive anymore, the pendulum starts swinging and you start losing
people being interested. You gotta dial it and work with people, all sides.
Even though you may have different perspectives, you can’t afford to
wallow in them. I think you can have a win-win, but you have to have the
players in place. So, I think dialogue is really key. I don’t think anyone
on any side has a luxury to be so stuck in their viewpoint, they play ostrich
and don’t engage anymore, and people lose. (Kim)

Virginia also commented on how management is also not just about applying
scientific principles, and that people are the ones who are determining how resources are
managed; “It’s people make it work or not. It’s people who are ethical or unethical. It’s
not the Forest Service. It’s not really the timber industry that is ethical or not ethical. It’s
the people, how you implement.” Similarly Urusula commented, “I thought they didn’t
need more foresters, they needed more social scientists.”

Harry commented about how much of his job is centered on being a mediator. I
asked him how he felt about playing such a role when he is supposed to be a scientist
dealing in the realm of data analysis.

Certainly, there’s a lot of irony there. You’re dealing with it seems
like two sides of your brain. Part of me is very analytical and linear;
this is the science, the biology, what makes sense to me. But, you’re
playing in this other sort of field, you can argue science all day and
you’re not going to win. You have to realize that’s not going to
work in this situation and how can you still get at the right answer
from the science side but work from a different approach.
Likewise, Matthew has often had experiences at work that have forced him to evaluate situations beyond the scientific level to the social level.

Everybody has their perspective, we all have our own stories that we’re telling ourselves. We negotiate and how we interact you are not always saying the same thing (as you think you are). So, I try to look at both sides. Palco is a classic example; they are coming from a completely different perspective as far as the resource is concerned. They want to make dollars and that can be in conflict with natural resources. The way that we can come in and talk about it we can be talking about the same thing, but looking at it from different ways. Palco wants to be most cost effective and we want to do the best thing for the species. It’s a trick to try and get those things to mesh, sometimes you can and sometimes not. It’s primarily from our background, our preconceived ideas about what we want to get out of it, or just our backgrounds. We’re coming from different points of view.

Those involved in natural resource debates address issues from different angles, not necessarily from a completely different perspective. “The most staunch environmental groups in this area have worked with me on the healthy forests initiative and because they recognize that it’s to everyone’s benefit because once again there are common goals there” (Ian). Similarly stated by Jennifer, “I feel you should leave your biases at the door and come in with a truly open mind, if we also truly listen then maybe we can come to some kind of common ground that everybody can somewhat agree with.”

“You tend to be at first very passionate you have more of a black and white view of things. You start to realize there’s a lot of grey” (Harry). “I think that we have this palette of values and you don’t often have the opportunity to really question them” (Nancy). Unfortunately, debate is often stifled because people do not feel comfortable. As one participant in my study commented, “I think a lot of the time people feel
threatened” (Peter). As Kelly commented, one of the most commonly encountered hurdles within the management process is to “Find a way to have people trust you who will inherently not trust you”.

Participants’ comments with regards to dealing with conflict in natural resource management fit well into this study’s presentation that conflict cannot simply be solved through better science. As stated by Brad,

Well, you know the bumpersticker “question authority?” I’ve always thought they should make one that says “question science” because science doesn’t always work. A lot of our issues in natural resource management deal with social issues, philosophical issues, and so there is a fine balancing act there. I can honestly say that we objectively look at all those issues, science does not necessarily drive every decision we make. Sometimes our science is not implemented because it is counter to social issues. That’s really what our job is about, finding that middle ground. Trying to balance all those different factions.

Ecological Worldview

As far as the participants’ philosophies regarding natural resources, each person seemed to take an ecologically pragmatic perspective. Participants understood the need to use natural resources, but also to temper use with conservation and preservation. Participants also adhere more to an aesthetic appreciation of natural resources. Sixty-eight percent of participants asserted that they view some natural resources as commodities, while 98 percent of participants value natural resources for their aesthetic value. Fifty-one percent disagreed that “all organisms are valuable, but some, especially humans, are more valuable.” All participants find the depletion of natural resources something to be concerned about, with 84 percent strongly agreeing.
DISCUSSION

The results of this study indicate that those working in the field of natural resource management have had similar experiences that largely led to the development of their ecological identity. Such commonality can be an avenue through which conflicts in natural resource management can be more easily navigated. Once it has been established that decisions are value-laden and each stakeholders’ valuation of natural resources has been laid out, mutual respect can be established through an understanding that similar experiences have led each person to be interested in the management of natural resources, thereby allowing for more effective communication and thus a better decision-making processes.

Results of this study are consistent with research findings that participation with nature in childhood positively influences adult environmental attitudes (Wells and Lekeis, 2006; Bixler et al., 2002). Wells and Lekies (2006) also suggested that early nature experiences may lead a child to first feel attachment to a specific natural place and then to have those feelings apply to the natural environment in general. An often-quoted statement by Gary Snyder, “Our relation to the natural world takes place in a place, and it must be grounded in information and experience” distinctly guided this topic (1990: 39). A special importance is placed on spontaneous environmental experiences (Kahn and Kellert, 2002). Pyle (1993) stated the unmanaged delving in nature allows for the
development of a distinct connection to nature. “It is through close and intimate contact with a particular patch of ground that we learn to respond to the earth, to see that it really matters (Pyle, 1993: xviii). Direct, personal contact with other living things affects us in vital ways that vicarious experience can never replace” (Pyle, 1993: 145).

This study builds on existing research examining the human dimensions of natural resource management. Human Dimensions Research investigates the roots of people’s environmental decision-making practices as well as reveals managers’ values and the resultant biases (Ewert, 1996). This study employed the life course approach, building upon the research avenue that was recently established by Wells and Lekies (2006) examining individual lives as sets of interwoven pathways or trajectories that together tell a life story. Specifically, this work builds on the field of significant life experiences literature that has established a correlation between childhood experiences and environmental attitudes among natural resource professionals (Chawla, 1999; Peterson and Hungerford, 1981).

Childhood outdoor experiences alone were found to have a more positive influence than those with family or others, which is consistent with the findings of Wells and Leikeis (2006). Time outside alone could allow for a deeper, more personal connection to develop. As commented by Wells and Lekeis (2006), solitary play in nature without the demands or distractions of other people, may be particularly critical. Further, extensive, spontaneous engagement with nature has a strong positive influence upon the development of environmental values.
Shared environmental experiences during childhood were common among the participants, which is consistent with the findings of Peterson and Hungerford (1981). They found that time in nature with others was often cited by the environmental educators as being influential on the development of their perspective on the environment. Experiences in nature can become all the more influential when significant members of an individual’s social group, family, friends, or possibly a teacher are present. Since many of a person’s first experiences in the natural world are with family members, it is often the case that there is a similarity in ecological values. Many studies have shown similarity in values between parents and maturing children (Kilby, 1993). Further, simply having someone present who means something to the individual and included in the experience makes one feel justified in assigning meaning to the experience and the associated strengthening of a relationship with the natural world.

In support of the claim by participants that their value orientation is similar to that of their parents, the questions regarding commodification and level of aesthetic appreciation of natural resources were found to be positively correlated between participants and their parents. Such a finding is consistent with statements made by Al Gore,

As a kid I often walked with my father over every part of the place...my dad taught me the moral necessity of caring for the land...it was from my mother that I first learned about the Earth’s vulnerability to human harm. When I was 14, my mother read Silent Spring by Rachel Carson. (2006:124)
The finding that being a witness to environmental degradation was a common source of impact upon the development of a person’s perspective on the natural world is consistent with the literature that states that having a childhood natural area be destroyed by development causes a shift in a person’s environmental perspective (Chawla, 1999; Ewert et al., 2000).

This study makes a unique contribution by including job experiences within the arena of possible influences on development of an ecological worldview, an influence not explored by previous studies. I had hypothesized that those who spent more time outside would be less likely to view natural resources as commodities, but results did not support that hypothesis. However, the study population was composed of natural resource managers and it is part of their job to view natural resources as commodities.

Wondolleck and Yaffee (2000) present one of the few examples of literature specifically attempting to implement a decision-making process based on common worldviews, as opposed to warring alternative positions, to the field of natural resource management with their book *Making collaboration work: Lessons from innovation in natural resource management*. It is important to focus attention on a shared future, based largely on common nature experiences, and to recognize that interests are related. According to Thomashow (1996), it is the stories of environmental experience that link people together.

Whether it’s a birder in central park, a business man on a rafting trip, a child growing tomatoes in an urban garden, a computer programmer who enjoys backpacking, a lone fisherman on a northern lake—there are many different types of people with ecological identities, ties to the
environment, that not only help define who they are but also affects the choices that he makes (Thomashow, 1996: xii).

Thomashow (1996) also stated that the most critical component of his ecological identity training is gaining the ability and willingness to look deeply within oneself, to understand motivations and clearly articulate environmental values, and know how one goes about applying them to personal and professional decisions. Therefore, it is important to unlock the basis one has for their environmental values.

Analysis and interpretation of data is dependent upon who is presenting the results as well as who is receiving them. Information must be interpreted in order for decisions to be made. Personal interpretation involves drawing upon personal values as a basis for decisions. As a result, every managerial decision is both moral and technical. In the arena of resource management decisions, because value and emotion are basically inseparable, it is impossible to avoid emotions when making important management decisions (Ewert, 1996). The interpretive process carried out by federal agency natural resource managers is heavily influenced by the values they hold. Environmental decisions must be informed by scientific research but cannot be settled by analysis alone, judgment is necessary (Dietz and Stern, 1998).

More meaningful deliberation was the ultimate goal of this study. Reflective communication in the field of natural resource management may allow stakeholders to see instances when they are presenting their values as if they are incontrovertible truths (White and Hall, 2006). Through mutual regard, solutions can be found that may actually please all stakeholders. Mutually beneficial solutions can be found. “Rarely are
solutions in resource management zero-sum” (Wondolleck and Yaffee, 2000: 50). In order for effective decision-making to take place, decision-makers should put aside their biases to curtail competition and enable greater cooperation. It is vital to try and understand the positions of the other interested parties involved in the conflict (Peine et al., 1999). Just as values are central to understanding people and their relationships to the environment, values are central to understanding the basis for managerial decisions (White and Hall, 2006). Discussion moving beyond what people want (their position) to why they want it (their interest) is crucial to finding solutions acceptable to all participants involved in a conflict (Kelsey, 2007).

In order to build on the theories presented by this study, similar studies should be conducted that address other populations. Specifically, samples should be taken from populations that differ in geographic region as well as by type (e.g. non-federal employees, public). The fields of environmental psychology and sociology are very applicable to investigations into improving natural resource management. Thus more interdisciplinary studies would be useful. In particular, the emerging field of conservation psychology, which is the scientific study of the reciprocal relationships between humans and the rest of nature, is applicable to improving natural resource management (Saunders, 2003). Conservation psychology also addresses the need for interdisciplinary thinking, creating stronger connections between the natural and social sciences, and acknowledging that biological knowledge alone is not sufficient to solve conservation problems. As stated in the editorial article, Conservation and the Social
Sciences, “Communication, collaboration, learning, and mutual respect represent the path to success” (Mascia et al., 2003: 650). This study fits into that field of study as it seeks to understand how humans relate to the natural world and how relationships with the natural world develop (Saunders and Meyers, 2003).
LITERATURE CITED


Berg, B. L. 2004. Qualitative research methods for the social sciences. Allyn and Bacon, Boston, Massachusetts.


Appendix A. Interview Guide

Principal Investigator: Jessica Birnbaum

Purpose and Nature of Study: Sociological perspectives on the development and foundations of natural resource values held by employees of federal natural resource management agencies in Humboldt County are examined for the insights that they provide. Interviewees values, based upon life experiences, are explored. Research proposes to bring up opportunity for improving natural resource decision processes.

Instructions: I will be asking open-ended questions exploring the adoption of natural resource values. There will always be the option to not answer any of the questions. There is the option to have the interviewees name included or excluded. The definitive decision regarding disclosure of name will be made at the end. I want the interviewee to feel perfectly free during the interview, so don’t hesitate to interrupt or ask clarification at any time. I would like to tape record the interview so that my full attention can be focused on the interviewee as well as to maintain the integrity of responses.

Explanation of my background, training, and interest in this area of inquiry: Studied biology at Trinity College, have experienced a number of shifts in my own natural resource values and perspectives. I have always taken more interest in the human dimension of natural resource management.
Appendix A. Interview Guide (continued)

**Interview Guide- Cover Sheet**

Interviewees name:

Interview #:

Date of interview:

Place of interview:

Gender:

Age:

Profession:

Time spent at agency:

Childhood residence:
Appendix A. Interview Guide (continued)

**Questions:**

*Experience of natural areas: Warm-up*

- Think about all the places that you have lived and the people that stand out at those places, any place and people in particular that have been important to you in your lifetime. Try to settle on one that you went to repeatedly maybe, one that stands out and tell me about it.

  - When did you first experience the outdoors?
  - Who if anyone influences the way in which you view environment? How did he/she influence your perspective on use of natural resources?
  - How, if at all, have your views changed?
  - Did you choose to live in particular areas because of the environment?

*Vocation:* Tell me a little about yourself, how did you become a (title)? - Consider generally such arenas as occupation, education, peers, family, childhood, and personal experiences.

  Have any of your job experiences had an effect upon your relationship with the environment/natural resources? Did those experiences function to reinforce already established beliefs, or did they serve to mold them in a different direction?

*Childhood:* Were there any aspects of your childhood that stand out as being influential in developing your perception of natural resources? A valued childhood home or vacation place surrounded by rural landscape or by forests, fields, mountains, lakes or seashore?

*Family:* Are the natural resource values that you hold similar to those of your family? Attachment to valued family land, such as a farm? Proenvironmental values learned from a family member through either examples of appreciation or protection (walks in the woods with parents, a grandparent’s gardening) or explicit teaching.
Appendix A. Interview Guide (continued)

Family examples of social justice, activism, the obligation to do what is right. Support from family later in life for environmental efforts.

*Outdoor Activities:* Natural settings, canoeing, camping, hiking, bird watching.

Adult exposure to valued natural settings.

*Organizations:* Volunteer. Participation in outdoor groups such as the Scouts, Outward Bound/NOLS, adult environmental organizations or neighborhood associations.

*Negative Experiences:* Habitat destruction. Build-up of a childhood area or favorite place. Decline of a species or habitat. Observation or fear of pollution.

*Education:* Was your education influential in establishing values associated with nature? Formal coursework or extracurricular activities such as internship or field trip. An inspiring teacher. Was the learning environment dominated by a particular viewpoint on natural resources?

*Friends:* Recruitment into an environmental organization or job position, discovery of environmental problem through a friend.

*Book or Author.*

*Principles of religion/beliefs:*

*Self-Identity:* Have you ever defended or reexamined your values because they did not fit with the values held by your peers or the status quo?

*Values:* Can you tell me about your philosophy regarding natural resources?

Probes: Do you view them as commodities or value them otherwise, or does it depend upon which resource one is talking about? Do you value certain natural resources over others? Do you find the depletion of natural resources to be something to be concerned about? What problems areas would you cite? Do you believe that
Appendix A. Interview Guide (continued)

environmental work is one way to make life meaningful? Does it stem from a concern for children, grandchildren, generations to come... How would you describe the person you are today with regards to your relationship with the natural world and what it offers? What do you think are the most important ways to establish a connection with the natural world?
Appendix B. Natural resource values survey

Please circle the response that most closely resembles your natural response.

Influences:
1. You have fairly vivid positive memories of spending time outside by yourself during your childhood (can be as simple as being in your backyard).
   Never  Rarely  Sometimes  Often
2. Growing up, you did outside activities (hiking, camping,..) with your family.
   Never  Rarely  Sometimes  Often
3. The overall opinion towards natural resources in your hometown was to value natural resources as commodities.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
4. Your parents value natural resources for their aesthetic qualities.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
5. Your parents value natural resources for their value as commodities.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
6. Your siblings value natural resources similarly to you (if you don’t have siblings, just skip question).
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree

Your ‘philosophy’ regarding natural resources:
7. Your values regarding natural resources are similar to your parents.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
8. You choose to live in a particular place largely because of the natural environment there.
   Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
9. You have had job experiences that caused you to change the way in which you value natural resources.
   Agree  Disagree
10. If you answered yes to question 8, the job experience gave you an increased appreciation for the aesthetic value of natural resources.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
11. You view natural resources as commodities.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
12. You value natural resources for their aesthetic value.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
13. All organisms are valuable, but some, especially humans, are more valuable
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree
14. You find the depletion of natural resources to be something to be concerned about.
    Strongly Agree  Agree  Neutral  Disagree  Strongly Disagree