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The Association Between Environmental Pers  
OSMP Studies 4861



STUDY

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## The Association between Environmental Perspective and Knowledge and Concern with Species Diversity

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This work was funded by the City of Boulder, Colorado's Open Space and Mountain Parks Department, where Matt Jones was especially helpful. Also, Amy Weiner provided valuable research assistance and we further acknowledge the insightful comments of three anonymous SNR reviewers.

## **The Association between Environmental Perspective and Knowledge and Concern with Species Diversity**

### **Abstract:**

As communities continue to engage in debate surrounding land use and preservation, insight into stakeholder knowledge and concern with local species becomes increasingly important. This project explores the association between individual knowledge/concern with species diversity as related to environmental perspective, measured through the New Ecological Paradigm scale. We aim to understand if concern with local species diversity is associated with species-specific knowledge and/or ecocentric outlooks more generally. Results from a mail survey in Boulder, Colorado reveal that individuals with ecocentric perspectives place greater priority on species preservation relative to those with anthropocentric perspectives, *regardless of species knowledge*. These results imply that to engage local publics in issues of biodiversity, outreach should not simply provide background specific to local species, but also demonstrate the significance of ecological integrity and biological diversity more broadly.

## **The Association between Environmental Perspective and Knowledge and Concern with Species Diversity**

Land managers are often faced with land users guided by distinctive outlooks toward human-environment relations (e.g., Kellert 1996; Reading, Miller, and Kellert 1999). Specifically with regard to public knowledge and concern with biodiversity, different land users will possess different levels of knowledge regarding local species as well as placing different levels of priority on local species preservation. This project examines an association as yet unexplored in the social science literature: the association between individual environmental perspective and knowledge/concern with species diversity. We report results of a mail survey with a random sample of households within the city of Boulder, Colorado. We argue that developing a more detailed understanding of public environmental perspectives as related to species conservation should be of interest not only to academic researchers, but to conservation activists, local policymakers, and land managers as well. In particular, a more thorough understanding of the correlates of local stakeholders' knowledge and perceptions toward species preservation allows better identification of effective means of environmental communication and education.

### **Background Literature**

Two topical areas within the social science literature provide background for the study. First, researchers have explored various means of measuring individual environmental orientation. Here we draw most heavily from recent work on the 'new ecological paradigm.' Second, researchers have examined public knowledge of, and concern with, environmental issues generally, and more specifically with regard to biological diversity. These literatures provide a

foundation for our examination of the ways in which such knowledge and concern are related to orientation toward environmental issues more broadly.

**Environmental Perspectives and the “New Ecological Paradigm:”** Since the late 1960s, a “burgeoning” body of research on environmental concern has been produced by sociologists and other scholars (Dunlap and Jones 2002:482). As recently explained by Dunlap et al. (2000), “environmental concern” has come to represent a broad concept referring to a wide range of phenomena – from awareness of environmental problems to support for environmental protection. Within the literature on environmental concern, several frameworks can be found for measuring such concern. These measurement tools include the Environmental Concern Scale (Weigel and Weigel 1978), the Ecology Scale (Maloney and Ward 1973), and the New Environmental Paradigm (Dunlap and Van Liere 1978).

Of these various measurement tools, the New Environmental Paradigm has received the most attention by sociologists, having been used by researchers in a variety of substantive arenas, and geographic and cultural contexts (Dunlap et al. 2000). The scale is now termed the New Ecological Paradigm (NEP) so as to reflect a more nuanced and sophisticated perspective toward human relationships to the natural world, a perspective that more critically recognizes the synergistic relationship between society and environment (Dunlap et al. 2000). The NEP scale incorporates 15 questions designed to tap five facets of an ecological worldview: the reality of limits to growth, antianthropocentrism, the fragility of nature’s balance, rejection of exemptionalism, and the possibility of an ecocrisis. Based upon responses to these questions, more environmentally-concerned individuals tend towards endorsement of the New Ecological Paradigm; individuals with such ecocentric perspectives tend to accept the presence of environmental limits, the possibility of an ecocrisis, and believe that humans have the

responsibility to be stewards of the Earth. Responses from individuals with more anthropocentric perspectives tend toward the scale's opposite pole, reflecting the Dominant Social Paradigm (previously labeled the Human Exemptionalist Paradigm). Here, exemptionalism reflects the idea that humans, unlike other species, are exempt from the laws of nature.

**Public Knowledge and Concern with Regard to Environmental Issues: A focus on Biodiversity.** As noted above, the contemporary New Ecological Paradigm scale has been designed to reflect a more sophisticated, systemic perspective toward human relationships to the natural world. Indeed, today's environmental issues generally appear more complex than localized issues of the past in that they tend to be geographically dispersed, less directly observable, and more ambiguous in origin; ozone depletion, deforestation, loss of biodiversity, and climate change all represent complex human-environment interactions, with complicated and potentially problematic solutions.

In the face of the ambiguity and complexity of contemporary environmental issues, the link between environmental knowledge and environmental concern is particularly intriguing. That is, how much knowledge does the general public possess with regard to these issues, and how is such understanding associated with concern? In general, the studies which have been undertaken suggest that Americans' professed environmental concern is *not* necessarily grounded in a clear understanding of ecological processes, the ways in which humans influence these processes, or the implications of human-induced environmental change (e.g., Bord, O'Connor, and Fisher 2000; Henry 2000; Jacobson and Marynowski 1997; Kempton 1991).

Specifically with regard to public knowledge of biodiversity and wildlife, research generally suggests that while the public possesses some general wildlife knowledge, individuals are typically unaware of scientific detail (Kellert 1985a, 1985b, 1993; Kellert and Berry 1987;

Mankin, Warner, and Anderson 1999). Processes that lead to species decline are also often wrongly attributed (e.g., Hunter and Brehm 2003; Mankin et al. 1999). In addition, certain types of biodiversity tend to attract inordinate public attention, these typically being “charismatic megafauna” such as elephants or tigers (Vandermeer and Perfecto 1995).

Variations in knowledge of wildlife and biodiversity issues are apparent along several socio-demographic dimensions. For instance, wildlife knowledge appears highest among those participating in nature/wildlife-oriented recreation, with birdwatchers scoring highest on knowledge test scores (Kellert 1985b). Gender variations are also evident, with knowledge of wildlife greater among males (Kellert and Berry 1987), and women typically less supportive of hunting (Mankin et al. 1999).

The general “disconnect” between environmental concern and environmental knowledge is aptly illustrated by the recent “Annual National Report Card on Environmental Attitudes, Knowledge, and Behavior” developed by the National Environmental Education and Training Foundation (NEETF). Based upon a nationwide survey, the Foundation rated the American public “A+” on attitude towards support of the environment, although a grade of “F” reflected the Foundation’s interpretation of the public’s level of environmental knowledge (NEETF 1999).

### **Research Objective and Hypotheses**

Interestingly, little academic work has actually brought together the areas of literature briefly reviewed above related to environmental perspectives and individual knowledge and concern with regard to biodiversity. To be clear, although biodiversity exists at the genetic, species, and ecosystem levels, this project focuses upon species diversity, concentrating on public knowledge/concern with regard to several native species facing decline.

Based upon the above literature, we put forth the following 3 hypotheses. In general, we assume that individuals with more ecocentric orientations will express greater concern with the potential loss of native species as a result of their orientation toward environmental stewardship, relative to those with more anthropocentric orientations.

*Hypothesis #1 [environmental perspective and species knowledge]*

Individuals with ecocentric perspectives will exhibit greater knowledge of local species relative to individuals with more anthropocentric perspectives;

*Hypothesis #2 [environmental perspective and species concern]*

Individuals with ecocentric perspectives will place greater priority on species preservation relative to individuals with more anthropocentric perspectives;

We also posit that both ecological orientations and knowledge regarding local species will be associated with greater interest in species preservation. Here we view knowledge of local species as a precursor to concern primarily due to prior work demonstrating this direction of association with regard to other environmental issues (e.g., Bord et al. 2000 [global warming]).

*Hypothesis #3 [environmental perspective, species knowledge, and species concern]*

Individuals with ecocentric perspective and species knowledge will place greater priority on species preservation relative to individuals with more anthropocentric perspectives and less species-specific knowledge.

## Data and Methods

**The survey:** The data are taken from a mail survey conducted with a random sample of residents of the city of Boulder, Colorado. The original sample of 1,000 residential households was purchased from a commercial sampling firm. A descriptive cover letter and 5-page survey were sent to the entire sample in late February, 2002. Follow-up postcards were sent to non-respondents 10 days later and, following an additional 10 days, another survey and letter were sent to those respondents still outstanding. In the end, 398 completed surveys were received from the 989 households with valid addresses, representing a response rate of slightly over 40 percent. Examination of the demographic characteristics of the respondents as contrasted with 2000 Census data suggest survey respondents tend to overly represent middle aged residents, women, higher education, non-Hispanic residents, and homeowners. We examined the utility of weighting the survey results by age and education in order to more closely represent the Boulder population. Importantly, the results did not change substantially, and due to the additional error introduced by weighting, the results presented here are unweighted.

As with any mail survey, bias related to non-response is a critically important issue. Herein, outside of examination of socio-demographic representativeness as described above, our primary concern with non-response was the potential for lesser representation of individuals simply not engaged in issues related to local species diversity and/or public land management more broadly. Logically we would anticipate these individuals to express lower levels of environmental concern, and as such we made use of the respondents' New Ecological Paradigm scores (methods described below) to determine if sufficient variation in environmental concern existed among survey respondents. As reflected in Chart 1, 171 respondents have below average NEP scores, therefore suggesting that the surveys incorporate substantial variation with regard to levels of environmental concern.

As for the generalizability of a Boulder survey, the city is arguably well-known for its environmentally-engaged citizenry and local politics in support of open space and local land management in favor of preservation (e.g., Clarke and Moss 1990). As such, while the environmental perspectives of Boulder residents may not be generalizable to the national population as a whole, the results yield important insights in two regards. First, the association between *variation* in perspectives and *variation* in knowledge/concern with regard to local species should be applicable to other populations. That is, within the Boulder population although the mean NEP score is likely high relative to a nationwide sample, we do find a range of values on the NEP scale (details below). Second, the Boulder-based results may be indicative of these associations in communities where land management issues have already been at the forefront of public dialogue. At the national scale, such community-based initiatives to preserve local open space and prioritize objectives are becoming increasingly common and, as such, Boulder's experience may portend future social dynamics surrounding such issues.

**Measurement:**

Environmental Perspective: Environmental perspective was measured through incorporation in the survey of the 15 questions presented by Dunlap et al. (2000) as the updated NEP scale. Respondents were asked to indicate whether they strongly agree, mildly agree, are unsure, mildly disagree, or strongly disagree with each of the included items. The questions are presented in Table 1, and agreement with the odd-numbered statements indicates a pro-NEP response and agreement with the even-numbered statements indicates an anti-NEP response.

A Cronbach's alpha of 0.87 reveals a high level of internal consistency among the 15 NEP items. To explore dimensionality more closely, we also examined the items through the perspective of principal components; all 15 items load relatively heavily (0.35 to 0.75) on the first unrotated factor (eigenvalue=5.24, subsequent factor's eigenvalue = 1.24). Although these

results suggest a single underlying dimension, following Dunlap et al. (2000), we subjected the data to varimax rotation to explore for the possibility of multiple dimensionality. Rotation yielded 3 factors, although no clear patterns were suggested.

In the end, we believe that there is evidence of a single underlying construct as measured by the NEP questions, with one caveat. One question does consistently demonstrate less contribution to the one predominant construct, that dealing with humans as subject to the laws of nature. Responses to this question demonstrated the lowest factor loading from the perspective of principal components, while results also suggest that elimination of this question from a summative scale would slightly increase the scale's Cronbach's alpha. As such, we eliminated this question from scale generation and created an unweighted NEP score for each respondent representing the mean value of responses to the remaining 14 questions. Coding is reversed on the questions for which agreement reflects a more anthropocentric perspective. As such, possible values range from 1 to 5, with actual respondent scores ranging from 1.14 to 5.00 (mean = 3.81 and standard deviation = 0.73; see Chart 1).

(Table 1 about here, NEP questions & scale)

(Chart 1 about here, NEP value distribution)

Species Knowledge/Concern: To examine knowledge/concern with specific species, in cooperation with City of Boulder Open Space & Mountain Parks Department representatives, six local species of "critical concern" were chosen to be incorporated within the survey. "Critical concern" represents a designation by local agencies reflecting the fact that development and

recreation pressure are reducing appropriate habitat although the species are not federally listed as threatened or endangered. The six species were chosen to represent both flora and fauna, as well as varying levels of “charisma,” as subjectively determined by the researchers and city representatives. A picture and brief description were provided of each species, its habitat needs and contribution to the local ecosystem. Respondents were then asked if they were previously aware of this species’ local presence (yes/no), and what priority they believed the species should receive in local land management decisions on a scale ranging from “1: no priority” to “5: high priority.” An open-ended question followed, whereby respondents were simply asked “why” they assigned a specific priority.

Respondent Background Characteristics: Also incorporated in the survey were key sociodemographic variables to be used as statistical controls within the following analyses. Herein, we consider respondent age, gender, education, income, number of children at home, and residential proximity to open space, to more accurately isolate the specific association between environmental perspective and concern/knowledge with local species.

**Analytical Strategy:** We first examine hypothesis #1 through ANOVA to reflect the relationship between a categorical variable reflecting yes/no prior species knowledge and NEP score (scale 1 to 5). Given the dichotomous nature of the dependent variable, we use logistic regression to examine hypothesis #1 in a multivariate context. For hypothesis #2, the dependent variables reflect priority scores (scale 1 to 5) for each incorporated species. As such, we present pairwise correlations to reflect the bivariate association between NEP score and perceived priority due each species. We then present multivariate estimates using Ordinary Least Squares as a result of the continuous nature of the dependent variable. The same multivariate estimation is used to examine hypothesis #3, with the addition of species knowledge as a predictor.

## Results

We make use of the three research hypotheses to organize the following presentation of results.

### *Hypothesis #1 [environmental perspective and species knowledge]*

Individuals with ecocentric perspectives will exhibit greater knowledge of local species relative to individuals with more anthropocentric perspectives;

Respondents' mean NEP scores according to knowledge of local species are presented in Table 2. The evidence clearly suggests that there is no difference with regard to environmental perspective between respondents who did, or did not, know prior to the survey of each incorporated species. As an example, respondents with prior knowledge of the Ute Ladies' tresses orchid had a mean NEP score of 3.84, while those without prior knowledge of the orchid had a mean NEP score of 3.79 (difference not statistically significant). Respondents with prior knowledge of the Townsend's Big-Eared Bat had a mean NEP score of 3.82, while those without prior knowledge had a mean NEP score of 3.81 (difference not statistically significant).

(Table 2 about here: Bivariate Hypothesis #1)

To control for socio-demographic variation among respondents, Table 3 presents multivariate logistic regression estimates of prior knowledge of each species (in section presenting hypothesis #1 results). Odds ratios (OR) are presented. Here, age is the most consistent predictor of knowledge, with older individuals significantly more likely to have previously been aware of the Preble's Meadow Jumping Mouse (OR = 1.24;  $p < 0.05$ ), the Ute

Ladies'-Tresses Orchid (OR = 1.48;  $p < 0.001$ ), and the Sharp-tailed Grouse (OR = 1.30 ;  $p < 0.01$ ).

Environmental perspective demonstrates no statistically significant predictive ability with regard to species knowledge, thereby corroborating the bivariate results that NEP score is not associated with prior knowledge of the species incorporated in the survey.

In all, we find no support for hypothesis #1, as individuals with ecocentric perspectives do not exhibit greater knowledge of local species relative to individuals with more anthropocentric perspectives.

(Table 3 about here: Multivariate Results)

*Hypothesis #2 [environmental perspective and species concern]*

Individuals with ecocentric perspectives will place greater priority on species preservation relative to individuals with more anthropocentric perspectives;

Bivariate results (see Table 4) clearly support this hypothesis through demonstration of statistically significant positive associations between NEP score and the priority respondents would assign each species within land management decisions. As examples, a strong 0.50 correlation exists between respondent NEP score and perceived priority due the Preble's Meadow Jumping Mouse and Black-tailed Prairie Dog in local land management decisions. Indeed, in the case of each species included in the survey, the higher a respondent's NEP score, the greater priority that individual would place upon each species in land management decisions.

(Table 4 about here: Bivariate Hypothesis #2)

The multivariate analyses (see Table 3, section on hypothesis #2) further support this association through consistently strong, positive OLS coefficient estimates for each species, controlling for the effect of respondent background characteristics. As for the sociodemographic characteristics, only a handful of statistically significant associations are revealed: older individuals tend to suggest less priority be afforded the prairie dog ( $b = -0.14$ ;  $p < 0.01$ ) and falcon ( $b = -0.09$ ;  $p < 0.05$ ), while women tend to suggest more priority be afforded the Preble's Meadow Jumping Mouse ( $b = 0.30$ ;  $p < 0.05$ ) as compared to men. Finally, higher income respondents tend to suggest lower priority for the Sharp-tailed Grouse ( $b = -0.08$ ;  $p < 0.01$ ) relative to those with less income.

Even with these sociodemographic characteristics statistically controlled, individuals with more ecocentric perspectives express a desire to have greater levels of priority placed upon each incorporated species in land management decisions, relative to individuals with more anthropocentric perspectives. As an example, each incremental increase (1 point on 1-5 scale) in NEP score, would equate with approximately  $\frac{1}{2}$  point (1-5 scale;  $b = 0.47$ ;  $p < 0.001$ ) predicted increase in perceived priority due the Peregrine Falcon in land management decisions.

In all, we find strong support for hypothesis #2, as individuals with ecocentric perspectives do place greater priority on species preservation relative to individuals with more anthropocentric perspectives.

*Hypothesis #3 [environmental perspective, species knowledge, and species concern]*

Individuals with ecocentric perspective and species knowledge will place greater priority on species preservation relative to individuals with more anthropocentric perspectives and less species-specific knowledge.

For hypothesis #3, given the focus on 3 variables (NEP, species knowledge, and concern), we present only multivariate models that incorporate prior knowledge of each species as a predictor of priority due within land management decisions (see Table 3, section on hypothesis #3).

For three species, prior knowledge does equate with greater priority perceived due in local land management decisions. The specific species were the Preble's Meadow Jumping Mouse ( $b = 0.44; p < 0.001$ ), the Townsend's Big-Eared Bat ( $b = 0.56; p < 0.001$ ), and the Sharp-tailed Grouse ( $b = 0.30; p < 0.05$ ).

Importantly, however, in no instance does the effect of environmental perspective lessen substantially following consideration of prior species knowledge, suggesting that knowledge does not supplant environmental perspective, but rather supplements it. In other words, regardless of species knowledge, individuals with ecocentric perspective place greater priority on species preservation relative to those with anthropocentric perspectives. Returning to the Peregrine Falcon as an example, regardless of prior species knowledge, as mentioned above, each incremental increase (1 point) in NEP score, would equate with approximately ½ point ( $b = 0.47; p < 0.001$ ) predicted increase in perceived priority due the Peregrine Falcon in land management decisions. With consideration of prior species knowledge, perceived priority due the Peregrine Falcon in land management decisions does not change ( $b = 0.46, p < 0.001$ ).

In all, we find very limited support for hypothesis #3, as species knowledge does not appear to be essential in the prioritizing of species preservation. Individuals with ecocentric perspective place greater priority on species preservation relative to those with anthropocentric perspectives, regardless of species knowledge.

### **Conclusion: Biodiversity Knowledge – Concern Disconnect?**

As stated at the onset, land managers are often faced with land users guided by distinctive outlooks toward human-environment relations. With regard to biodiversity, stakeholders will vary with regard to levels of knowledge of local species, while also differing with regard to priority desired for species preservation on local public lands.

The results reported herein contribute to, and expand upon, the literature on public environmental perspective and concern/knowledge with regard to biological diversity. Our findings reveal strong support for the contention that individual environmental perspectives are associated with support for species preservation as a priority in local open space land management. Specifically, ecocentric individuals assign substantially higher priority, within land management decisions, to each of six species incorporated within the survey.

Especially interesting, however, the higher priority afforded species within land management decisions does not appear to be grounded in consistently higher levels of knowledge of particular species. These results are intriguing when placed within the context of other research linking environmental knowledge and concern within the context of other environmental issues, particularly global warming.

With regard to global warming, Kempton (1991) argues that reducing greenhouse gas emissions will require the cooperation and consent of consumers and workers, therefore they must possess knowledge about global warming in order to make informed decisions. In support

of this contention, Bord et al. (2000) find that environmental concern does not necessarily equate with relevant behavioral changes, and that accurate knowledge is the strongest single predictor of intentions to adjust behavior in ways that might lessen climate change (e.g., drive less, choose car with good gas mileage, replace old appliances with energy efficient models, weatherize homes). In general, some argue that since the costs of environmental protection are often borne by the public, citizens' comprehension of the scientific and environmental policy issues are significant to the political decision-making process (Kempton 1991).

Much like the case of global warming, it is logical to consider that protection of biodiversity will require public participation and cooperation. As such, an important question becomes: is public knowledge of local species a precursor for public support of species preservation within local land management? Our results suggest not necessarily. Rather, environmental perspective represents a consistently strong indicator of support for species preservation, suggesting that outreach and education aimed at increasing environmental concern more generally represents a potential mechanism for garnering support for issues related more specifically to species preservation. Here, the key audience becomes those with more anthropocentric perspectives, with outreach not needing to focus specifically on wildlife facts, but, rather, aiming to advance environmental concern more generally.

Although environmental perspective has been linked to environmental attitudes and behaviors in other realms, to our knowledge, no work to-date has linked such outlooks to knowledge and concern with biological diversity; Hence, the contribution of this study. Although our Boulder-based results are not immediately generalizable to communities across the nation, they may be indicative of these associations in regions where land management issues have received substantial public and policy attention. In addition, as public debate surrounding

land use and preservation issues becomes increasingly common across the nation, insight into stakeholder knowledge and concern becomes increasingly important. Certainly when seeking public involvement in land management decisions, it is useful to have insight into public understanding of the local biodiversity, as well as general levels of public concern with species preservation. Based upon these results, to engage local publics in issues of species diversity, outreach should not simply provide background specific to local species, but also demonstrate the significance of ecological integrity and biological diversity more broadly.

## References

- Bord, R.J., R.E. O'Connor, and A. Fisher. 2000. In what sense does the public need to understand global climate change? *Public Understanding of Science*. 9(3): 205-218.
- Clarke, S. E. and A. K. Moss. 1990. Economic growth, environmental quality, and social services: Mapping the potential for local positive-sum strategies. *Journal of Urban Affairs* 12(1):17-34.
- Dunlap, R.E. and R.E. Jones. 2002. Environmental Concern: Conceptual and Measurement Issues. Pp. 482-524 in R.E. Dunlap, W. Michelson (eds.) *Handbook of Environmental Sociology*. Westport, CT: Greenwood Press.
- Dunlap, R.E. and K.D. Van Liere. 1978. The New Environmental Paradigm: A proposed measuring instrument and preliminary results. *Journal of Environmental Education*. 9(4):10-19.
- Dunlap, R. E., K. D. Van Liere, A. G. Mertig, and R. E. Jones. 2000. Measuring endorsement of the New Ecological Paradigm: A revised NEP scale. *Journal of Social Issues*. 56(3):425-442.
- Henry, A.D. 2000. Public Perceptions of Global Warming. *Human Ecology Review*. 7(1):25-30.

- Hunter, L. M. and J. Brehm. 2003. Qualitative Insight into Public Knowledge of, and Concern with, Biological Diversity. *Human Ecology Review*. 31(2):309-320.
- Jacobson, S.K. and S. M. Marynowski. 1997. Public attitudes and knowledge about ecosystem management on Department of Defense Lands in Florida. *Conservation Biology*. 11(3):1-13.
- Kellert, S. R. 1985a. Attitudes toward Animals: Age-related Development Among Children. *Journal of Environmental Education* 16(3): 29-39
- 1985b. Birdwatching in American Society. *Leisure Sciences*. 7: 343-360.
- 1993. Values and Perceptions of Invertebrates. *Conservation Biology*. 7(4): 845-855.
- 1996. *The Value of Life*. Washington DC: Island Press.
- Kellert, S. R. and J. K. Berry. 1987. Attitudes, Knowledge, and Behaviors Toward Wildlife as affected by Gender. *Wildlife Society Bulletin*. 15(3): 363-371.
- Kempton, W. 1991. Lay Perspectives on Global Climate Change. *Global Environmental Change*. 1(3): 183-209.
- Maloney, M. P. and M. P. Ward. 1973. Ecology: Let's hear from the people. *American Psychologist*. 28(7): 583-586.
- Mankin, P.C., R.E. Warner, and W.L. Anderson. 1999. Wildlife and the Illinois public: a benchmark study of attitudes and perceptions. *Wildlife Society Bulletin*. 27(2): 465-472.
- National Environmental Education and Training Foundation (NEETF). 1999. *The Eighth Annual National Report Card on Environmental Attitudes, Knowledge, and Behavior*. Washington, D.C.: Roper-Starch Worldwide.
- Reading, R.P., B.J. Miller, and S.R. Kellert. 1999. Values and attitudes toward prairie dogs. *Anthrozoös*. 12(1): 43-52.

Vandermeer, J. and I. Perfecto. 1995. Breakfast of Biodiversity: The Truth About Rain Forest Destruction. Oakland, CA: Institute for Food and Development Policy.

Weigel, R. and J. Weigel. 1978. Environmental concern: The development of a measure. *Environment and Behavior* 10(1): 3-15.

**Table 1. Frequency Distributions and Item-Total Correlations for the New Ecological Paradigm Scale Items<sup>a</sup>**

Do you agree or disagree <sup>b</sup> that:	SA <sup>c</sup>	MA	U	MD	SD	(N)	$r_{IT}$
1. We are approaching the limit of the number of people the earth can support.	40.36%	28.65%	12.50%	12.50%	5.99%	(384)	0.56
2. Humans have the right to modify the natural environment to suit their needs.	5.79	33.95	7.63	36.32	16.32	(380)	0.44
3. When humans interfere with nature it often produces disastrous consequences.	43.38	35.06	5.71	13.51	2.34	(385)	0.55
4. Human ingenuity will insure that we do NOT make the earth unlivable.	6.25	20.31	22.14	28.12	23.18	(384)	0.52
5. Humans are severely abusing the environment.	52.48	33.16	4.70	6.01	3.66	(383)	0.56
6. The earth has plenty of natural resources if we just learn how to develop them.	19.27	27.34	14.32	20.31	18.75	(384)	0.41
7. Plants and animals have as much right as humans to exist.	54.95	25.78	4.43	8.85	5.99	(384)	0.50
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.	2.62	7.85	10.21	31.94	47.38	(382)	0.54
9. Despite our special abilities humans are still subject to the laws of nature.	62.30	31.94	2.88	2.09	0.79	(382)	0.31
10. The so-called "ecological crisis" facing humankind has been greatly exaggerated.	3.89	12.69	10.88	28.24	44.30	(386)	0.68
11. The earth is like a spaceship with very limited room and resources.	34.03	38.44	8.57	13.77	5.19	(385)	0.56
12. Humans were meant to rule over the rest of nature.	4.74	13.16	10.00	20.53	51.58	(380)	0.55
13. The balance of nature is very delicate and easily upset.	39.12	37.05	9.33	11.92	2.59	(386)	0.45
14. Humans will eventually learn enough about how nature works to be able to control it.	1.82	12.24	22.66	30.99	32.29	(384)	0.46
15. If things continue on their present course, we will soon experience a major ecological catastrophe.	32.20	34.03	15.18	14.14	4.45	(382)	0.65

<sup>a</sup>Question wording: "Listed below are statements about the relationship between humans and the environment. For each one, please indicate whether you STRONGLY AGREE, MILDLY AGREE, are UNSURE, MILDLY DISAGREE, or STRONGLY DISAGREE with it. The series of questions will take approximately 4 minutes to answer and is designed to reflect your general stand on environmental issues. Please think carefully and answer truthfully."

<sup>b</sup>Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items indicate pro-NEP responses.

<sup>c</sup>SA = Strongly Agree, MA = Mildly Agree, U = Unsure, MD = Mildly Disagree, and SD = Strongly Disagree.

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**Table 2. The Association between Environmental Perspective and Knowledge of Species of Local Concern**

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	Mean NEP Score <sup>1</sup>		Sig.
	<i>Prior Knowledge</i>	<i>No Prior Knowledge</i>	
Preble's Meadow Jumping Mouse	3.86	3.76	0.20
Black-tailed Prairie Dog	3.81	3.74	0.72
Ute Ladies'-tresses Orchid	3.84	3.79	0.58
Peregrine Falcon	3.81	3.73	0.37
Sharp-tailed Grouse	3.74	3.85	0.15
Townsend's Big-eared Bat	3.82	3.81	0.92

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1: NEP = "New Ecological Paradigm," with higher scores representing more ecocentric outlooks.  
Potential Range = 1 to 5.

**Table 3: Multivariate Estimations of Prior Species Knowledge and Perception of Priority Due Each Species in Local Land Management.**

	Preble's Meadow Jumping Mouse	Black-tailed Prairie Dog	Ute Ladies'- tresses Orchid	Peregrine Falcon	Sharp-tailed Grouse	Townsend's Big-eared Bat
<b>Hypothesis #1</b>						
<b>Prior Knowledge (logistic regression odds ratios presented; outcome = 0/1 with 1 = prior knowledge of species)</b>						
NEP <sup>1</sup>	1.58	0.60	1.12	1.24	0.88	1.04
Age (years)	1.24 *	0.86	1.48 ***	1.16	1.30 **	0.96
Gender (1=female)	1.10	1.10	0.71	0.69	0.64	1.19
Education (5 categories)	1.15	1.37	1.01	0.92	0.80	0.94
Income (8 categories)	1.05	1.09	0.91	1.01	0.87	0.88
Children < 18 at home	1.08	0.80	0.98	1.29	1.60 *	1.44
Use of open space (never -> daily)	0.99	1.00	0.84	0.94	1.06	1.03
Proximity to open space (close -> distant)	0.95	0.89	0.83	1.03	0.84	0.93
Pseudo R <sup>2</sup>	0.05	0.04	0.09	0.02	0.05	0.02
<b>Hypothesis #2</b>						
<b>Perceived Priority Due (OLS coefficients presented; outcome = range 1-5 with 5 = highest priority)</b>						
	Preble's Meadow Jumping Mouse	Black-tailed Prairie Dog	Ute Ladies'- tresses Orchid	Peregrine Falcon	Sharp-tailed Grouse	Townsend's Big-eared Bat
NEP <sup>1</sup>	0.56 ***	0.79 ***	0.55 ***	0.47 ***	0.48 ***	0.40 ***
Age (years)	-0.07	-0.14 **	0.03	-0.09 *	0.02	-0.05
Gender (1=female)	0.30 *	0.12	0.15	-0.11	0.13	0.06
Education (5 categories)	0.08	-0.02	0.06	0.06	0.05	0.07
Income (8 categories)	-0.05	-0.01	-0.06	-0.04	-0.08 **	-0.07
Children < 18 at home	-0.11	-0.12	-0.11	-0.05	0.03	0.00
Use of open space (never -> daily)	0.01	0.01	-0.03	0.02	-0.01	0.01
Proximity to open space (close -> distant)	-0.05	0.01	-0.03	-0.02	-0.03	-0.02
Constant	1.63 **	0.91	1.49 **	2.57 ***	2.21 ***	2.54 ***
R <sup>2</sup>	0.26	0.27	0.19	0.18	0.19	0.12
<b>Hypothesis #3</b>						
<b>Perceived Priority Due, Incorporating Prior Knowledge of Species (OLS coefficients presented; outcome = range 1-5 with 5 = highest priority)</b>						
	Preble's Meadow Jumping Mouse	Black-tailed Prairie Dog	Ute Ladies'- tresses Orchid	Peregrine Falcon	Sharp-tailed Grouse	Townsend's Big-eared Bat
NEP <sup>1</sup>	0.51 ***	0.79 ***	0.55 ***	0.46 ***	0.49 ***	0.40 ***
Prior knowledge of species (1=yes)	0.44 ***	-0.33	0.35	0.27	0.30 *	0.56 ***
Age (years)	-0.10 *	-0.14 **	0.01	-0.10 *	0.00	-0.05
Gender (1=female)	0.28 *	0.10	0.17	-0.07	0.15	0.04
Education (5 categories)	0.06	-0.01	0.06	0.08	0.06	0.07
Income (8 categories)	-0.05	-0.01	-0.06	-0.04	-0.07 *	-0.05
Children < 18 at home	-0.12	-0.12	-0.10	-0.08	-0.02	-0.04
Use of open space (never -> daily)	0.01	0.01	-0.02	0.03	-0.01	0.00
Proximity to open space (close -> distant)	-0.05	0.01	-0.02	-0.02	-0.02	-0.01
Constant	1.79 ***	1.22	1.41 **	2.36 ***	2.00 ***	2.32 ***
R <sup>2</sup>	0.31	0.27	0.20	0.20	0.21	0.19

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

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**Table 4: Bivariate Correlations Between Respondent Score  
on NEP and Perceived Priority Due Species of Local Concern**

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	<i>Correlation with NEP Score<sup>1</sup></i>	<i>Sig.</i>
Preble's Meadow Jumping Mouse	0.50	0.00
Black-tailed Prairie Dog	0.50	0.00
Ute Ladies'-tresses Orchid	0.44	0.00
Peregrine Falcon	0.44	0.00
Sharp-tailed Grouse	0.42	0.00
Townsend's Big-eared Bat	0.39	0.00

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1: NEP = "New Ecological Paradigm," with higher scores representing more ecocentric outlooks.  
Potential Range = 1 to 5.

Chart 1: Distribution of Respondent NEP Scores

