Interest in Understanding Ecosystem Service Values by Conservation Professionals in the Northeastern US

Abstract: A multi-state survey was implemented in December 2018 to assess the information needs of natural resource conservation professionals regarding the value of land conservation in their community. Findings reveal that most respondents do not have the information needed to incorporate ecosystem service values into planning and decision-making. There is opportunity for extension services to deliver economic information and training that can advance the management of conserved lands.

Keywords: Conservation, professionals, ecosystem services, economic values, decision-making

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Introduction

Natural areas provide many benefits to society including clean water and air, wildlife habitat, and cultural services (e.g., e.g., Chan et al., 2006). The well-being of many communities is often strongly dependent on private efforts to conserve natural areas and advocate for conservation

related benefits (Endicott, 1993). Leading these efforts are organizations such as land trusts and forest owner associations, who have a direct or indirect influence on the management of millions of private forest acres. For example, in the United States private land trusts have helped conserve over 56 million acres, or almost 10% of all conserved land in the US (public and private, Land Trust Alliance, 2015).

Among many conservation advocates, demand for conservation science has shifted away from understanding the intrinsic values of conservation in favor of understanding the environment for its benefits to humans (Doak et al., 2015). Advances in non-market valuation and the development of the Ecosystem Services decision framework (Chan et al., 2006) has provided decision-makers, mostly within government agencies, new ways of understanding the value of land conservation (e.g., existence value, Farber, 2002). Economic assessments of conservation related ecosystem services could not only help with cost-benefit planning, but also help organizations attract more investors or identify opportunities to participate in new types of markets (Naidoo et al., 2006). Unfortunately, many private organizations do not have the information or capacity (e.g., trained staff) to employ these types of strategies.

Extension services has the potential to provide private conservation organizations the information and skills needed to understand the value of their conservation activities. Considering the extension needs of this professional audience can also promote positive changes in rural communities, by reducing social costs or growing the economy through new market opportunities, which helps fulfill the extension mission.

Objective

The goal of this study was to investigate the economic information and training needs of conservation professionals who want to incorporate ecosystem services values into planning and decision-making.

Approach

The professional audiences targeted in this study were associated with organizations that work to protect and restore wildlife, natural areas and mixed-use rural lands. In January 2018, a web survey

invitation was delivered to the email addresses[1] of 362 non-governmental conservation organizations located in the Mid-Atlantic region and surrounding states. The survey contained over 20 multiple choice and Likert scale questions measuring important organizational characteristics (e.g., acres managed, annual revenues). Questions also asked about their preferences for research information about ecosystem service benefits and values, and information delivery.

Results

We received 156 responses from Pennsylvania, Ohio, Maryland, New York and Virginia of which 104 were complete. This resulted in a response rate of 43% and a completion rate of 66% (95% CI, 8% SE). Each organization had an average of 1.18 individuals who responded to the survey. Most organizations were non-profit conservation groups and/or land trusts, fewer responses came from private associations (e.g., woodland owner associations) and public-private partnerships.

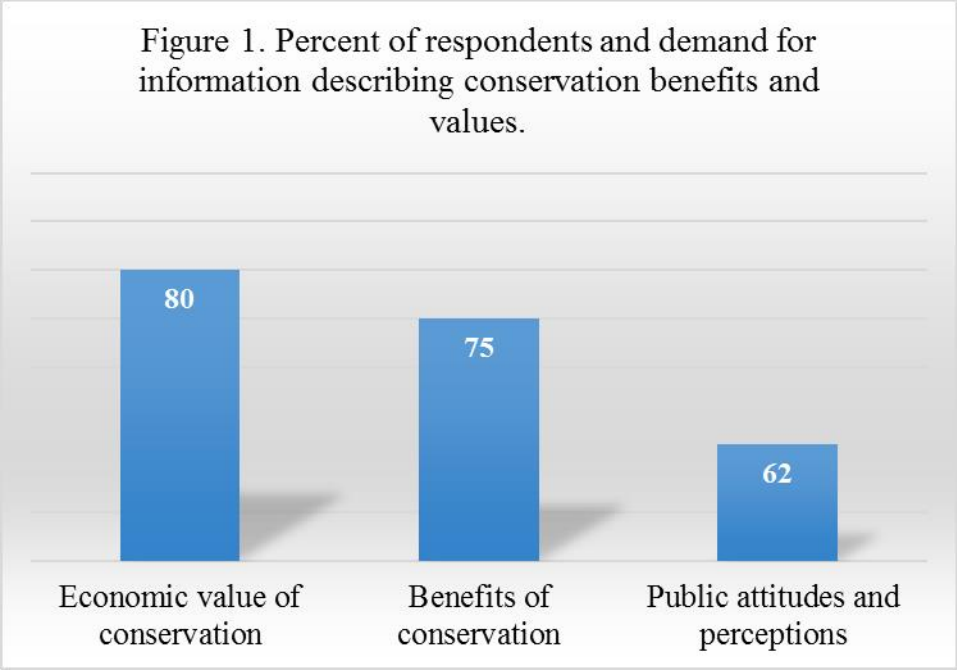
Organization Characteristics

Organizations had an average landholding of 23,270 acres (SE 10,036) and 660 (SE 610.9) miles of trails. Over 70% had programs that provided environmental education/outreach to diverse groups of stakeholders. Fifty-nine percent communicated stakeholder or landowner interests to government officials. Almost a third provided grants or financial assistance (24.4% and 27.8% respectively) to individuals who helped advance the conservation mission. Important sources of income for responding organizations included grants, member fees and donations. Over half (49.0%) of organizations reported a modest increase in income over the last five years.

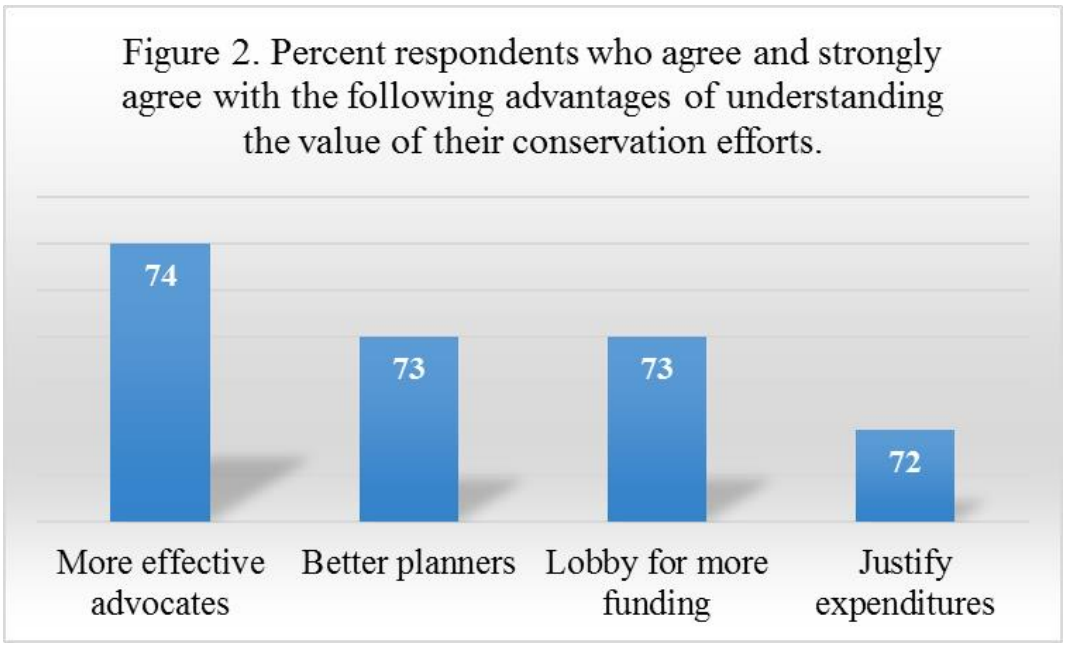
Usefulness of Obtaining Economic Values

A majority of respondents reported they were "very likely" to use information about the economic values associated with the benefits of conservation/restoration (79.8%), how forests and natural areas help benefit humans (75.0%), and people's attitudes and perceptions of ecosystems and conservation (62.5%; Figure 1). Many also wanted to learn methods for measuring/quantifying important benefits and values on their own (69.2%). Respondents were also "somewhat likely" and "very likely" to use information about how other organizations assess the impact of their programs to help with their own assessments (42.3% and 39.4% respectively).

[1] Email addresses were collected from organizations' websites and include both personal email addresses and organization email addresses.



The majority of respondents "agreed" and "strongly agreed" that obtaining information about the value of conservation would help them, "Be more effective advocates for stakeholders." (47.1% and 26.9% respectively), "Make better management and planning decisions." (40.3% and 32.6% respectively), "Lobby for more funding." (44.2% and 28.8% respectively)", and "Justify expenditures." (45.1 and 26.9% respectively; Figure 2).

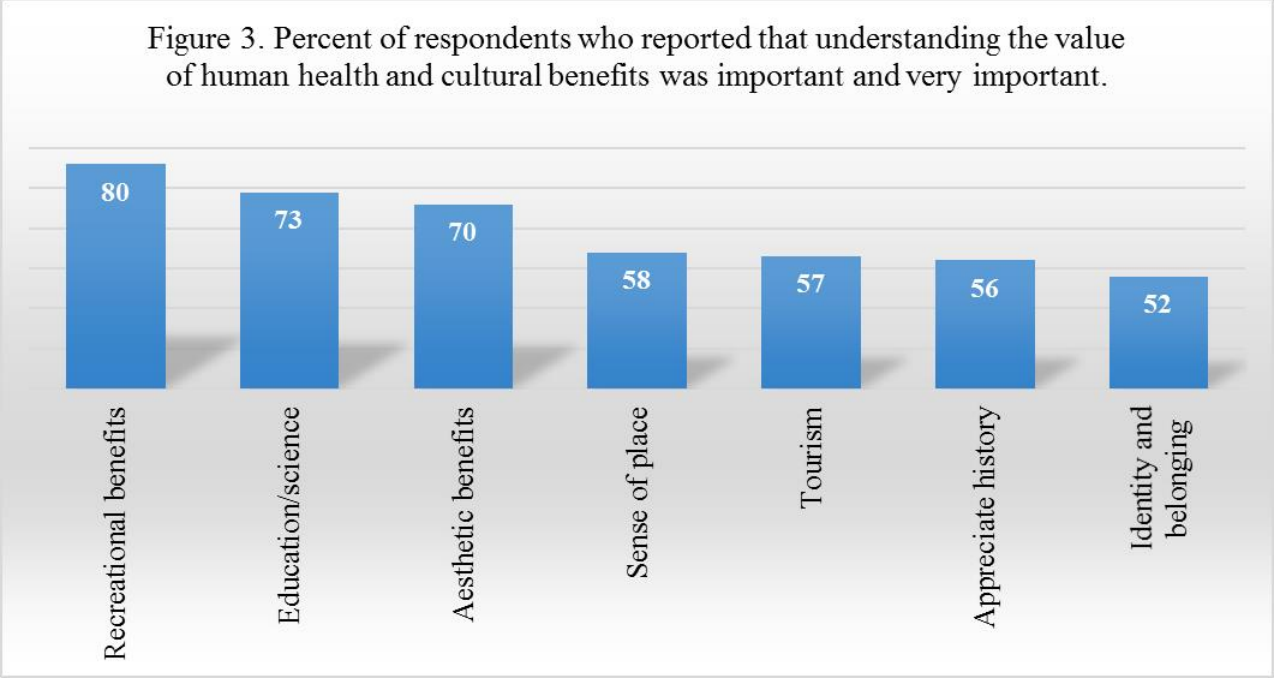


Seventy-one percent of respondents reported that their organization was not familiar with the Ecosystem Services Framework, and that this classification strategy had not been incorporated into their plan of work. Conversely, 1.9% of respondents reported that this classification of benefits underpinned their plan of work and is often used to help guide decision-making.

Important Conservation Benefits

A majority of respondents placed a high priority on understanding the value of conserved lands for human health and culture (Figure 3). The topics ranked as "important" and "very important" were education and scientific understanding (25.0% and 48.0%), recreational benefits (33.6% and 47.1%), human health benefits (26.9% and 56.7%), aesthetic benefits (32.6% and 37.5%), sense of place (29.8% and 27.8%), tourism (29.8% and 26.9%%), appreciating history (31.7% and 24.0%), identity and belonging (27.8 and 24.0%).

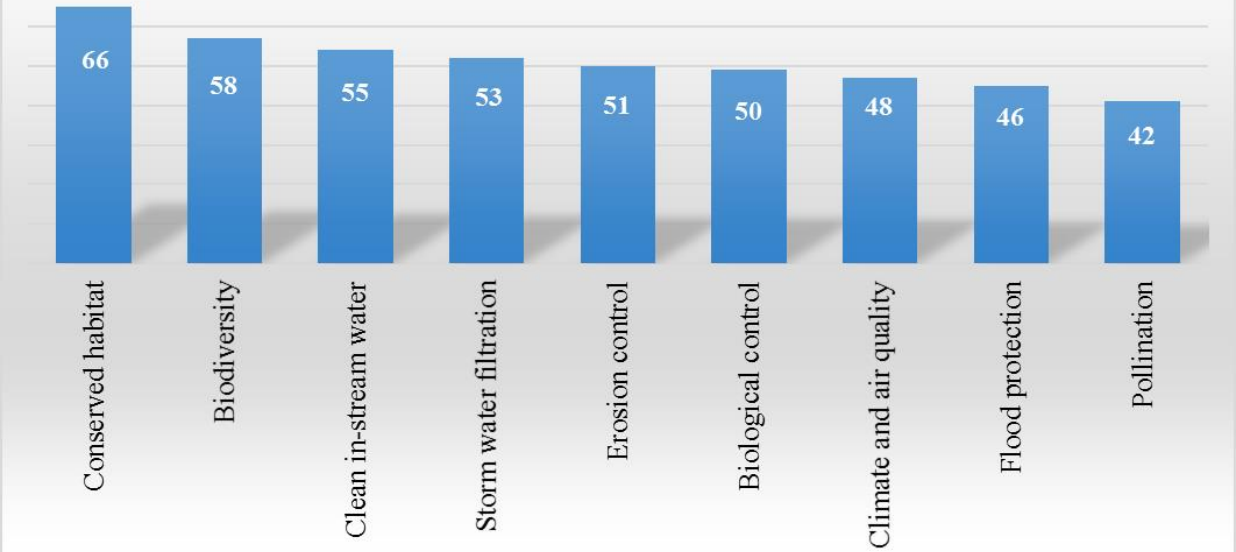
Figure 3. Percent of respondents who reported that understanding the value of human health and cultural benefits was important and very important.



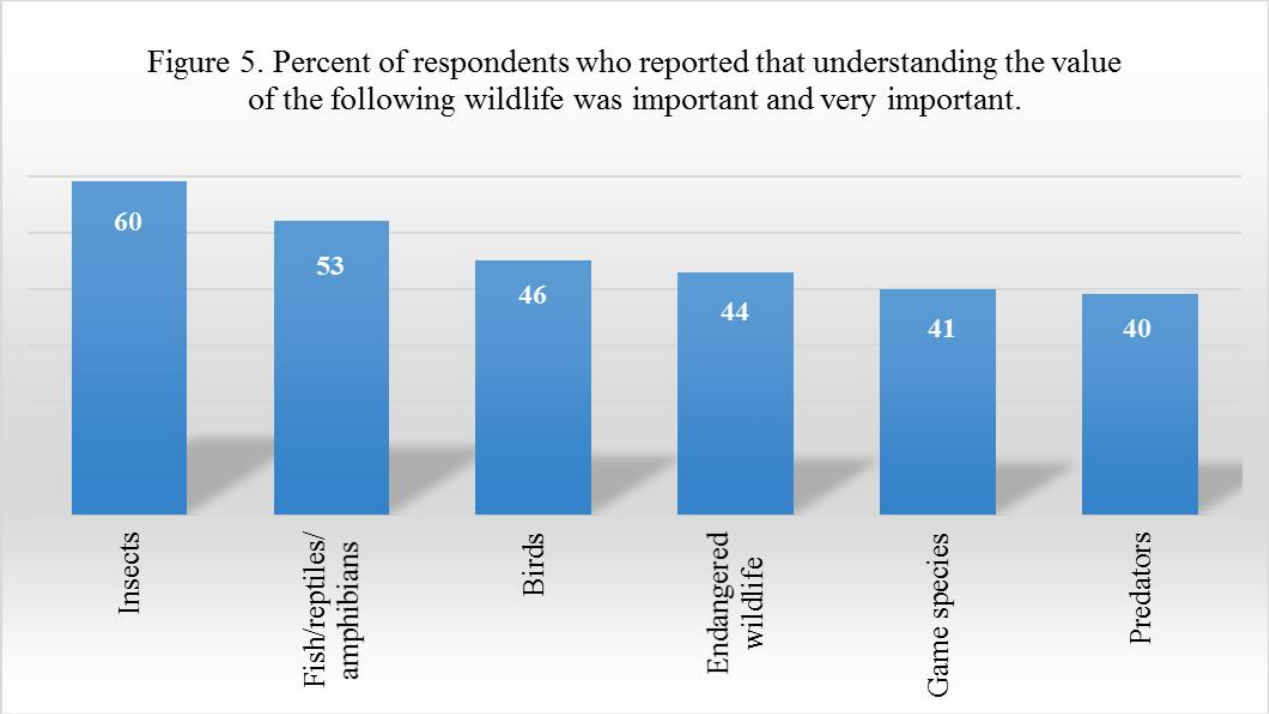
Most respondents also placed a high priority on understanding the value of regulating and supporting ecosystem services provided by conserved lands (Figure 4). The services ranked by the majority as "important" and "very important" were conserved habitats (14.7% and 50.9% respectively), biodiversity (13.8% and 44.2% respectively), clean in-stream water supply (13.8% and 41.3%), storm water filtration (21.2% and 31.7% respectively), erosion control (18.4% and 32.6% respectively), and biological control (24.9% and 25.0% respectively). Other ecosystem

services that were also highly ranked, but not by the majority, were climate and air quality (12.9% and 35.5% respectively), flood protection (20.3% and 25.9% respectively), and pollination services (22.1% and 27.8% respectively).

Figure 4. Percent of respondents who reported that understanding the value of the following regulating and supporting ecosystem services was important and very important.



Wildlife topics were also considered by many to be important (Figure 5). The types of wildlife topics ranked as “important” and “very important” by the majority of respondents were insects (30.1% and 29.2% respectively), and fish, reptiles and amphibians (27.1% and 26.3% respectively). Also highly ranked, but not by the majority, were bird species (23.3% and 22.6% respectively), endangered wildlife (22.3% and 21.6% respectively), game species (21.3% and 20.7% respectively) and predators (20.3% and 19.7% respectively).



Extension Delivery Preferences

Most respondents were open to receiving information through a variety of platforms, but some platforms were more preferred than others. A majority stated they were most likely to use fact sheets (69.0%). Following this were online valuation calculators (47.6%), and a searchable database of valuation studies (41.4%). About a third of respondents reported that they were very likely to use workshops, newsletters, social media, training programs and videos.

Discussion

Professionals in conservation and environmental outreach are more likely to be seen as allies of extension, because of a shared vision and mission (Endicott, 1993). As such, it could be easy to miss how this category of professionals may also benefit from extension. For most respondents, organization funding was generally increasing, suggesting that public support for private land conservation and organizations of this type are growing. Corroborating this finding, voter support for land conservation is also on the rise in many part of the Eastern US (Kreye et al., 2019). If this trend continues, professionals in private conservation will need better access to information that will help them make better planning and management decisions for the benefit of nature and society (e.g., costs and benefits, see Naidoo and Ricketts, 2006).

A key finding of this study was that a majority of private conservation organizations have not yet adopted the classification concepts and valuation strategies recently advanced in conservation research (i.e., Ecosystem Services Framework, non-market valuation). Moreover, respondents often placed a higher value on acquiring economic information, as compared to information about public attitudes and perceptions, suggesting that important decisions are often made within an economic context. A significant amount of valuation research is already funded through federal and state grants (e.g., USDA, NIFA), and the Ecosystem Services framework is often used by government agencies to help with planning and policy design (e.g., US Forest Service). The academic research underpinning these activities, however, does not appear to play a major role in helping advance decision-making on private conserved lands.

Many of the professionals surveyed wanted to understand how conservation can help enhance human health and culture in order to promote the connection between humans and ecosystems (Haines-Young and Potschin, 2010). This perspective is also appealing to members of the public (e.g., landowners), some of which prefer to work with local private conservation groups compared to government agency programs (Kreye et al., 2017). The importance placed on regulating and supporting ecosystem services, as well as wildlife, indicates that most professionals think that conservation values should be understood from a holistic and biocentric perspective. Many of the findings in this study are also in agreement with the findings reported in a nationwide survey of land trusts (Land Trust Alliance, 2015).

Conclusions

Private conservation organizations play an important role as protectors and advocates of our natural heritage. Many also provide education to the public and assistance to landowners that is tailored to their community's needs. The connection between these organizations and the wellbeing of the communities makes this audience important for helping fulfill the extension mission (i.e., disseminating research to help create positive changes in rural communities; Wu, 2008). Unfortunately, many private conservation organizations do not have the resources or professionals with the training needed to employ new research-based methods in ecosystems service valuation, which could improve their planning and decision-making.

An important limitation of this study was the size of the standard error associated with the survey sample. The low completion rate also suggests that some respondents opted to not complete the

survey. Drop-off locations in the survey were most often associated with questions about program funding. This suggests that at least some portion of incomplete surveys my have been the result of some respondents not being knowledgeable about their organization's funding resources, and not a disinterest in the topics presented.

Citations

Chan, K. M., Shaw, M. R., Cameron, D. R., Underwood, E. C., & Daily, G. C. (2006). Conservation planning for ecosystem services. PLoS biology, 4(11), e379.

Doak, D. F., Bakker, V. J., Goldstein, B. E., & Hale, B. (2015). What is the future of conservation?. In Protecting the wild (pp. 27-35). Island Press, Washington, DC.

Endicott, E. (Ed.). (1993). Land conservation through public/private partnerships. Island Press.

Farber, S. C., Costanza, R., & Wilson, M. A. (2002). Economic and ecological concepts for valuing ecosystem services. Ecological economics, 41(3), 375-392.

Haines-Young, R., & Potschin, M. (2010). The links between biodiversity, ecosystem services and human well-being. Ecosystem Ecology: a new synthesis, 1, 110-139.

Kreye, M. M, Adams, D.C., and Kline, J. (2019). Gaining Voter Support for Watershed Protection. Land Use Policy, in press.

Kreye, M. M., Pienaar, E. F., Soto, J. R., & Adams, D. C. (2017). Creating Voluntary Payment Programs: Effective Program Design and Ranchers' Willingness to Conserve Florida Panther Habitat. Land Economics, 93(3), 459-480.

Land Trust Alliance, 2015. National Land Trust Census Report. Accessed August 20, 2019 at http://s3.amazonaws.com/landtrustalliance.org/2015NationalLandTrustCensusReport.pdf

Naidoo, R., Balmford, A., Ferraro, P. J., Polasky, S., Ricketts, T. H., & Rouget, M. (2006). Integrating economic costs into conservation planning. Trends in ecology & evolution, 21(12), 681-687.

Naidoo, R., & Ricketts, T. H. (2006). Mapping the economic costs and benefits of conservation. PLoS biology, 4(11), e360.

Wu, J. (2008). Land use changes: Economic, social, and environmental impacts. Choices, 23(316-2016-6225), 6-10.