3-1-2006

Training Opportunities Available to Ohio Lake Erie Basin Local Decision-makers Regarding the Economic and Fiscal Benefits of Coastal and Watershed Stewardship

Wendy A. Kellogg
Cleveland State University, w.kellogg@csuohio.edu

Erica Matheny
Cleveland State University, e.matheny@csuohio.edu

Follow this and additional works at: https://engagedscholarship.csuohio.edu/urban_facpub

Part of the [Other Public Affairs, Public Policy and Public Administration Commons](#), [Urban Studies and Planning Commons](#), and the [Water Resource Management Commons](#)

How does access to this work benefit you? Let us know!

Publisher's Statement

© 2006 Elsevier

Original Citation

Kellogg, W., , & Matheny, E. (2006). Training Opportunities Available to Ohio Lake Erie Basin Local Decision-makers Regarding the Economic and Fiscal Benefits of Coastal and Watershed Stewardship. *Journal of Great Lakes Research*, 32(1), 142-157.

Repository Citation

Kellogg, Wendy A. and Matheny, Erica, "Training Opportunities Available to Ohio Lake Erie Basin Local Decision-makers Regarding the Economic and Fiscal Benefits of Coastal and Watershed Stewardship" (2006). *All Maxine Goodman Levin School of Urban Affairs Publications*. 0 1 2 3 67.
https://engagedscholarship.csuohio.edu/urban_facpub/67

This Article is brought to you for free and open access by the Maxine Goodman Levin School of Urban Affairs at EngagedScholarship@CSU. It has been accepted for inclusion in All Maxine Goodman Levin School of Urban Affairs Publications by an authorized administrator of EngagedScholarship@CSU. For more information, please contact library.es@csuohio.edu.

TRAINING OPPORTUNITIES AVAILABLE TO OHIO LAKE ERIE BASIN LOCAL DECISION-MAKERS REGARDING THE ECONOMIC AND FISCAL BENEFITS OF COASTAL AND WATERSHED STEWARDSHIP

Wendy Kellogg, *Cleveland State University*

Erica Matheny, *Cleveland State University*

Abstract *This paper presents new knowledge about the current status of training on the economic value of stewardship practices in the Ohio Lake Erie basin. Local decision-makers shape coastal and watershed conditions but often do not appreciate the economic, fiscal, and ecological benefits that could be gained from sound stewardship practices. This study investigated the information and training about economic benefits available in the Ohio Lake Erie basin. Training providers and technical assistance professionals helped identify key training needs and challenges to decision-maker awareness of benefits. We found relatively few organizations offering training that incorporate economic or fiscal benefits into their curricula. Within these programs, stormwater management and tourism were the most popular training topics among local decision-makers. Regarding target audiences, training providers noted that public sector participants tended to be interested in the fiscal (tax revenue and public spending) impacts of regulations and in economic development. Our analysis suggests a need to document the economic and fiscal benefits and costs to existing practices in the Lake Erie basin to provide case studies and examples for peer-to-peer education for local decision-makers. The results suggest a need for increased collaboration among training providers and educational institutions in the Lake Erie basin to develop case studies or fact sheets of benefits and costs. The results also suggest that creating a technical advisory network concerning economic benefits and costs would provide a useful service to local decision-makers.*

INTRODUCTION

This paper presents new knowledge concerning the status of technical training regarding the economic value of stewardship practices in the Ohio Lake Erie basin. Local decision-makers—elected officials, planners, engineers, economic development practitioners, industrial leaders, farmers, marina operators, fisheries workers, tourism and recreational facility operators, and other landowners—affect coastal and watershed resources through land use, infrastructure, business, and economic development decisions. Their decisions reshape riparian corridors, aquifer recharge areas, riparian and isolated wetlands, aquatic and terrestrial habitat, coastal dune and bluff areas, coastal wetlands, and estuaries and are therefore critical to sound stewardship practices in coastal and watershed areas. Each type of decision-maker is guided by particular

interests, responsibilities, and authority shaped by the institutional, economic, and ecological conditions in a given coastal and watershed area. The knowledge base of many decision-makers does not normally include coastal and watershed issues more typically held by natural resource managers.

Decision-makers would need to expand their knowledge to include both scientific and technical information about the function and value of coastal or riparian ecosystems and management and institutional knowledge regarding land management, land planning, and other decision-making processes that support or require coordinated strategies and actions (Kellogg 1997, Kellogg *et al.* 2005). Scientific and management knowledge focused on the Great Lakes is relatively abundant, including what has been accumulated through the State of the Lakes Ecosystem Conferences (SOLEC 1994, 1996, 1998), Remedial Action Plans (RAPs) (Hartig and Law 1994), Lake Area Management Plans

*Corresponding author. E-mail: wendy@urban.csuohio.edu

FIG. 1. *Ohio Lake Erie basin, with counties, major cities, and major tributary rivers.*

(LAMPs) (U.S.EPA 2002), and dozens of other programs. The problem in the Great Lakes basin is not a lack of scientific and technical information but the uneven distribution of information to the local level. In particular, and the focus of our study, local decision-makers may or may not be aware of or may not fully appreciate the value of ecological services and the economic and fiscal benefits (and cost avoidance) that accrue from protection of these services.

Ohio's Lake Erie basin, the locus of our study (Fig. 1), consists of 34 counties, 530 townships, and 395 incorporated municipalities. The landscape ranges from a predominantly flat lake plain with agricultural settlement patterns in the west, to the glacial till and ancient lakeshore dunes of the urbanized central basin, to the wooded ravines of the Appalachian foothills in the east exhibiting an ur-

banizing settlement pattern. The basin contains 11 major tributary systems (from west to east, the Maumee, Portage, Sandusky, Huron, Vermillion, Black, Rocky, Cuyahoga, Chagrin, Grand, and Ashtabula rivers) and numerous streams running directly into Lake Erie. Population in the basin is approximately 5.3 million (U.S. Census 2004) and includes the metropolitan areas around Cleveland and Toledo. The economic value of ecological integrity in the basin has become a focus for the several state agencies that comprise the Ohio Lake Erie Commission (OLEC), embodied in the principles and strategies of the Lake Erie Restoration and Protection Plan of 2000 (OLEC 2000). OLEC's recent Balanced Growth Program seeks to involve local decision-makers, and in particular local governments, in planning to achieve economic development based on ecological goals for the basin

(OLEC 2004). A key part of these and other efforts is increasing local decision-maker understanding of the relationship between ecological integrity and economic vitality.

What information and knowledge is available through training, education, and technical assistance in the Ohio Lake Erie basin about the economic value of ecosystem services? What information is lacking? These questions framed our investigation described in this paper.

Economic Benefits and Ecosystem Valuation

Measurement of the economic value of natural resources and ecosystem services has received much attention in recent years in both academic literature and in federal environmental protection and natural resource management agencies (U.S.EPA 2000). This literature contains three broad areas: methodologies for assigning value (or valuation); delineation of the types of economic benefits or value and cost savings related to specific ecological function and stewardship; and case studies to quantify and otherwise characterize the economic benefits and fiscal savings from specific restoration, protection, and pollution control activities. While space limitations prevent a full discussion of the literature, we can provide examples.

Cangelosi (2001) describes three frameworks for estimating the economic value of natural capital and system services: whether the value is articulated by the market or by non-market mechanisms; whether the resource provides direct use or has a non-use (or existence) value; and whether the resource has extractive and/or in situ services where the value accrues without disturbing the function. Others identify methods for assigning economic benefits and costs avoided, including use of network theory to create an index of captured ecosystem value (Gustavson *et al.* 2002), the use of direct and observed methods such as market prices and replacement costs for natural services (Raab and Steinnes 1979, Acharya 2000, Heal 2000), direct and hypothetical/predictive methods such as contingent valuation, simulated markets/shadow prices, or bioeconomic models (Lindsey and Knaap 1999, Loomis *et al.* 2000, Cangelosi 2001, Howarth and Farber 2002, Knowler *et al.* 2003, Holmes *et al.* 2004); and indirect and observed methods such as travel cost and property valuation using hedonic pricing (Adams 1988, Mays 2003).

The second area of literature describes the specific economic benefits or costs avoided by ecologi-

cal stewardship practices. For example, Costanza *et al.* (1997) characterize the benefits of ecosystem services as the "benefits human populations derive, directly or indirectly from ecosystem functions." Some of these benefits are directly economic, whereas others are indirect. Stokoe (1993) identifies five categories or levels of ecological benefits (in this case to watershed restoration): sustainability benefits, avoided costs, use benefits (together constituting goods and services for which people would be willing to pay), direct economic development benefits, and indirect and induced economic development benefits (or the sum of the benefits or impacts resulting from public and private capital and operating expenditures). Day *et al.* (2004) estimate the fiscal savings by using wetlands to treat wastewater effluent.

Finally, the literature describes applications of valuation methods to specific cases. For example, Bolund and Hunhammar (1999) conducted a study of direct services of urban ecosystems in Stockholm, indicating that the true value of street trees, parks, forest, cultivated land, wetlands, streams and lakes accrued in how they synergistically offered the services of air filtering, noise reduction, microclimate regulation, rainwater drainage, sewage treatment, and recreational and cultural values. Lindsey and Knaap (1999) used contingent valuation and willingness to pay methods to estimate the value of an urban greenway in Indianapolis, Indiana. Mays (2003) describes a study that combined willingness to pay and hedonic price analysis of home values to measure the benefits of cleaning up of Waukegan Harbor. Shrestha and Alavalapati (2004) likewise estimate the willingness to pay for protection of the watershed of Lake Okeechobee, Florida. Morgan and Owens (2001) estimate the monetized benefits to boating, fishing, and swimming activities from improvements in the Chesapeake Bay as a result of the Clean Water Act. Johnson and Baltodano (2004) assess the economic value of improved watershed services in Nicaragua and compare the relative costs and benefits of alternative land management interventions. And, Knowler *et al.* (2003) describe the use of a "bioeconomic" model to estimate the value of ecosystem protection to the Coho salmon industry on the Pacific Canada coast.

The types of ecological benefits and services in the literature as being of economic value and also relevant for local stewardship practice are arrayed in Table 1. This literature includes materials focused on ecological services or capital (Daily 1997,

Daily 2000, Woodward and Wui 2001, Gustavson *et al.* 2002) and avoided costs, use benefits, direct economic development benefits, and indirect or induced economic development benefits (Stokoe 1993, Cangelosi 2001) across a range of practices relevant to coastal and watershed function.

The Role of Local Governments

Chartered multi-purpose local governments—including townships, incorporated municipalities, and counties—are obligated to protect and enhance public health, safety, and welfare. To fulfill these responsibilities, local governments undertake a range of activities, many of which impact coastal and watershed resources directly or indirectly, including infrastructure development, land use regulation, economic development, and compliance with the environmental regulations of state and federal governments. First, local governments provide basic infrastructures, including roads and sewer and water systems. The location of this infrastructure shifts land development patterns by providing the necessary urbanized built form for commercial, industrial, and residential activities. The location and extent of the built form has a direct impact on many ecological resources, including habitat, wetlands, riparian corridors and coastal features (U.S.EPA 1992, Schueler 1997, Marsh 1998).

Local governments control the land development process in their jurisdictions through public ownership of land and by regulation with zoning and subdivision requirements. Zoning regulations control how land is used (whether for industrial, commercial, residential, or open space) and the location of buildings and other features on a property. Subdivision regulations control the type of infrastructure and the overall layout of residential properties (Branch 1998). (In the Ohio Lake Erie basin, incorporated municipalities regulate land use through zoning. Townships, which have less broadly defined powers, may also use zoning, but many cede this authority back to counties. Incorporated municipalities and counties, but not townships, have authority for subdivision regulation.) These activities determine, among other things, the flow of storm water off a building site, the amount of vegetation on a site, and the degree to which the natural topography and vegetation are disturbed during site preparation and construction (Arendt 1996, Kellogg 1997, Center for Watershed Protection 1998). All of these factors affect downstream conditions in a wa-

tershed in terms of soil erosion, flooding, and pollution.

Local governments shape economic markets through their economic development programs and the land regulation and infrastructure provision to support them. These programs are designed to influence private sector decision-makers, who create jobs through development or redevelopment in the jurisdiction, ultimately increasing income and property tax revenues to support community services. These programs affect conditions in watersheds and coastal areas by changing the pattern of land development, the kinds of activities occurring in resource areas, and the kind of pollutants entering surface water (Kemp 1995, Hopkins 2001).

Local governments must also comply with state and federal law and regulations in the course of conducting their own activities and in any regulation of the private sector. For example, many provisions of the Clean Water Act shape the actions of local governments, including permits for pollutant discharges, storm water management, and designated flood plain control areas (Dowden and McNurney 1995, Kellogg 1997, U.S.EPA 2005). Local government decision-makers must balance fiscal constraints as they ensure compliance with federal and state regulations that affect the quality of Lake Erie's tributaries and near-shore areas. The cost of such compliance is often considered a burden, a perception perhaps stemming, in part, from an incomplete understanding of the value of these ecosystem resources and the economic benefits accrued and costs avoided through sound stewardship practices (U.S.EPA 2000). Through all their activities, local governments have the fiscal responsibility to ensure that income and property tax revenues are sufficient to provide for services and programs. Local decision-makers are thus very receptive to quantified measures of economic impacts. Revenues increase when the income of residents and the value of private property, against which taxes can be levied, increase. Costs are decreased to the extent possible through efficiency and reduction of risk to public health and safety.

How do ecological stewardship and economic benefits relate to local practice? Ecological stewardship can be described as long-term restoration or investment in natural resources that protects the stock of natural "capital" while accommodating human actions to live off of the ecological "interest" from that ecological "capital" (Daily 1997, Cangelosi 2001). Ecological benefits may be obtained through a variety of different stewardship

TRAINING OPPORTUNITIES

TABLE 1. Summary of literature on economic and fiscal benefits and stewardship practices*.

Relevant Literature Organized by Benefit Type									
Application	Increased Property Value	Taxes	Infrastructure Efficiencies/ Cost Savings	Risk/ Liability Avoidance	Economic Development	Direct Economic Benefits to Users	Local Tourism	Habitat & Wildlife	Ecosystem Services
Greenways	Potschin & Young 2003		Bolund & Hunhammar 1999		Kaplowitz 2001, Collados & Duane 1999, Howarth & Farber 2002, Lerner & Poole 1999	Collados & Duane 1999, Costanza 2000, Heal 2000, Howarth & Farber 2002, Lindsey & Knaap 1999, Pennsylvania Economic League, Inc. 1997	Jaworski & Schwartz 1994	Howarth & Farber 2002	Costanza 2002, Bolund & Hunhammar 1999
Fisheries			Stanley 2000		Burbridge <i>et al.</i> 2005, Frankic & Hershner 2003, Knowler <i>et al.</i> 2003, Gustavson <i>et al.</i> 2002	Koenings 2002, Raab & Steinnes 1979		Johnson 1989, Knowler <i>et al.</i> 2003	
Coastal Management & Erosion	Cordes & Yezer 1995, Kriesel <i>et al.</i> 1993			Bower & Turner 1998, Day <i>et al.</i> 2004	Cordes & Yezer 1995	Bower & Turner 1998, Adams 1988, Bartz 1989, Matichich <i>et al.</i> 1995, Letson & Milon 2002, Huang nd	Bower & Turner 1998, Bartz 1989		
Erosion control/ Best management			Loomis <i>et al.</i> 2000, Mitchell <i>et al.</i> nd	Bower & Turner 1998	Brismar 2002	Husak & Grado 2003			
Stormwater Management			Bolund & Hunhammar 1999, Conservation Ontario 2001, Bitter & Bowers 1997, CWP 2001	Ohio EPA 2002	CWP #30	Booth & Leavitt 1999			Bolund & Hunhammar 1999
Nonpoint Source Pollution	Morgan & Owens 2001		Isaac 1998	Stanley 2000	Stanley 2000	Rogers <i>et al.</i> 1998, Morgan & Owens 2001		Knowler <i>et al.</i> 2003	

TRAINING OPPORTUNITIES

<i>Watershed/ Wetland Restoration</i>	Stein & Anderson 2002, Mays 2003, Fogarty <i>et al.</i> 1991	Mays 2003	Loomis <i>et al.</i> 2000, Conservation Ontario 2001, Sohrakoff 1999, Johnson and Baltodano 2004	Conservation Ontario 2001, PA 2000	Acharya 2000, Howarth & Farber 2002, Stokoe 1993	Lewan & Soderqvist 2002, Costanza 2000, Heal 2000, Stein & Anderson 2002, Daily 2000, Sohrakoff 1999, Decision Research Corp. 1992, EPA 2000, Fogarty <i>et al.</i> 1991, Lewan & Soderqvist 2002, National Park Service 2001	Stein & Anderson 2002, Shrestha and Alavalapati 2004	Loomis <i>et al.</i> 2000, Lewan & Soderqvist 2002, Acharya 2000, Daily 2000, Holmes <i>et al.</i> 2004	Jewitt 2002
<i>Floodplain Management</i>				Lerner & Poole 1999	Acharya 2000, Brismar 2002, Jewitt 2002	Gren <i>et al.</i> 1995, Daily 2000		Acharya 2000, Daily 2000, Jewitt 2002	
<i>Water Quality</i>	Moore & Siderelis 2001		Day <i>et al.</i> 2004	Machado & Mourato 2002	Van Beukering <i>et al.</i> 2003	Moore & Siderelis 2001, Rogers <i>et al.</i> 1998, Gren <i>et al.</i> 1995, Husak & Grado 2003, Morgan and Owens 2001	Van Beukering <i>et al.</i> 2003		
<i>Landscape Planning</i>	Arendt 1996				LeRoy <i>et al.</i> 1999				Collados & Duane 1999, Daily 2000

* Complete citations for matrix available at URL <http://urban.csuohio.edu/glefc/watershed/index.htm>

FIG. 2. *Examples of local economic benefits from stewardship practices.*

practices. Economic benefits accrued include increases in land value and market activity toward achieving economic development goals. Fiscal benefits and costs avoided for local governments are those associated with increases in tax revenues or decreases in spending, respectively, enjoyed by the local jurisdiction. While ecosystem science can inform decision-makers as to the ecological benefits of ecosystem function and natural resources, economic valuation may assist local decision-makers in providing the appropriate incentives to shape individual and community behavior (Heal 2000). An understanding of the direct costs and prices of substitutions to ecosystem services may also assist local decision-makers as they weigh options for public spending. Figure 2 illustrates the relationships between enhanced knowledge base, local actions, benefit outcomes, and overall fiscal and ecological conditions.

Local Stewardship Practices and Knowledge Transfer

Local officials must have a working knowledge of many aspects of governance, including market function and regulation across issues of land use, jobs, schools, recreational open space, and infrastructure provision. It is uncommon to find local decision-makers with an in-depth understanding of ecological sciences, therefore the consequences of their decisions on ecological resources in watersheds and coastal areas may not be well understood. These decision-makers will not likely have an in-depth understanding of the ecological services that

these resources provide, yet these services have economic value that is critical to the health, safety, and welfare of community residents (Bolund and Hunhammar 1999, Norberg 1999, Heal 2000).

The value assigned to a particular natural feature or system is, of course, contested in a given situation, as who is valuing, for what purpose, about what geographic and chronological scope, and what end shapes the valuation process (Costanza 2000). Costanza and Folke (1997) propose that valuation of ecosystem services in the public sector is based on three goals: efficiency, fairness, and sustainability. Local officials, in the course of their deliberations, make tradeoffs in the use of public monies based in part on how they assign value. They are bound to consider economic, community, and ecological goals, but the relative weight given to these goals is in part a function of their valuation process, which is, of course, in part a function of their knowledge of ecological function. We suggest that to the extent that the value of ecosystem services can be made commensurate with other economic calculations, local decision-makers will be able to take these services into account more fully as part of their decision-making (Daily 1997, Bower and Turner 1998).

The relationship between possession of knowledge and action or behavior related to or in reaction to that knowledge is uncertain. Logically, it would follow that local stewardship practices to protect ecosystem services would increase as a result of increased education about and awareness of the ecological and economic benefits that might accrue to a

FIG. 3. Model of change and use of knowledge by local decision-makers.

locality from stewardship. However, the process from knowledge to action can be a complex one. Figure 3 presents a model of the relationship between a changed knowledge base and a change in behavior for local decision-makers. The question addressed in this paper is what the current “stock” is of information concerning the economic and fiscal benefits of stewardship (A, Fig. 3) in the Ohio Lake Erie basin and how is this knowledge base disseminated to local decision-makers (B)?

A body of professional knowledge regarding the economic benefits of stewardship exists (A), generated primarily by the academic research community and natural resource and planning professionals (G). Local decision-makers can “tap into” this knowledge base (B), changing their own knowledge (C), which they then might apply to their local decisions (D1), likely within a given set of constraints generated locally such as budget limits, community goals, and electoral politics (E). This application would feed back into their knowledge base (D2), and, if documented (F) to and by other knowledge-generators (G), could serve to enhance the overall professional knowledge base that exists (A).

While adoption of new decision-making criteria will be shaped by a variety of local conditions, new knowledge fostering new ways of perceiving a situ-

ation is critical for adopting innovation or initiating change (Spence 1994). One way decision-makers obtain new knowledge is through training and dissemination of educational materials by professional agencies. Examining the availability of such programs and information allowed us to identify one set of opportunities for knowledge transfer to local decision-makers.

Research Methodology

The research used three methodologies: a review of relevant literature (illustrated in Table 1); a telephone questionnaire submitted to information, training, and technical assistance providers working in the Ohio Lake Erie basin; and a focus group of professionals who provide technical assistance to local decision-makers on watershed and coastal stewardship issues.

Literature Review

The purpose of the literature review was to array the type of economic benefits that have been identified and match these to a set of applications relevant to local decision-makers. The purpose of the questionnaire was to identify how the current information and training opportunities in the basin were

similar or dissimilar to this array. The purpose of the focus group was to inform participants about the results of the literature review and provider questionnaire, to solicit their perceptions on the information needs of local decision-makers, and to inform our future research. The literature review included academic and professional (practitioner-oriented) journals, books, and other documents in the fields of coastal management, watershed planning and management, open space and habitat preservation, land use planning, infrastructure management, and economic development. We sought materials that defined concepts and analytical frameworks, estimates of value, case study applications, and best practices as these related to economic and fiscal benefits or savings accruing from good stewardship practices. Federal, state, and nonprofit organization web pages were also reviewed for practitioner-oriented materials. These included the Army Corps of Engineers, the National Sea Grant Program, the Coastal Coalition, numerous soil and water conservation districts, and the World Water Partnership.

The resources identified through the literature searches were organized into a matrix format according to application setting or topic (wetlands, greenways, erosion, etc.) and type of economic/fiscal benefit (infrastructure cost reduction, increased tax revenue, increased property values, tourism expenditures, etc.) presented in Table 1. This format was used to identify existing information that might be relevant and any information "gaps" that otherwise might be relevant to local decision-makers. Blank cells in Table 1 indicate that the search found no studies directly relevant to the application and benefits described. Results from the literature review were used to develop the questionnaire given to training providers and to develop the materials used at the focus group/workshop session.

Questionnaire

The purpose of the questionnaire was to identify current training opportunities in the Ohio Lake Erie basin that focus on or include economic aspects of stewardship practices. Potential respondents were identified using a database assembled for a previous study of the coastal management training market in the Lake Erie basin (GLEFC 2002). Thirty five organizations participating in that study had indicated that they provide training sessions or materials related to economic or fiscal aspects of coastal management. From our initial contact we found that 10

TABLE 2. Training Provider Categories Interviewed.

Training Provider Type	Interviewed (N = 19)
Local/county government agency	1
State environmental or natural resource agency	2
University or university-based research	2
State university extension agent (Sea Grant/Land Grant programs)	6
Federal agency (including EPA, NCRS)	5
Nonprofit organization	2
Private sector consultants engaged in training	1

of these organizations were no longer delivering this information, most often because the person who had given the training sessions was no longer employed with the organization. Through the course of administering the questionnaire, an additional 10 organizations with relevant training topics were identified from interview responses. From this population of 35, we completed 19 questionnaires across a range of organizational types. Table 2 presents the distribution of these respondents across seven categories. Eleven of the respondents were federal agents posted to the region or university-based extension agents. The remaining respondents were evenly distributed across local government, nonprofit, state resource, or consultant organizations. Given Ohio's participation in both Land Grant and Sea Grant programs, the strong presence of extension agents as training providers is not surprising. These extension agents focus on both resource and economic development issues in the Lake Erie basin. The strong federal presence is felt predominantly from the Natural Resource Conservation agents who are typically posted in county soil and water conservation district offices. (The questionnaire is available at <http://urban.csuohio.edu/glefc/watershed/index.htm>)

The questionnaire was administered using a telephone interview format. We contacted potential respondents and secured their consent to participate in the study. The questionnaire was sent to the respondent via fax or email to provide an opportunity for the respondent to review the questions. During the initial contact, we scheduled a telephone date and time, and one of the project team later called the respondent back to retrieve answers over the telephone. This method allowed the respondent to answer questions more accurately and allowed the research team to get more information on open-

ended questions and probe for additional meaning during the interview.

The questions focused on the types of services provided (training, educational materials, and technical assistance), the training topics the respondents offered, their target audiences, the level of interest among training participants across a variety of economically oriented topics, the kind of technical assistance provided, any non-economic (ecologically oriented) training and education services offered, and the needs of the organization to deliver its training more effectively. The results of the questionnaire were tabulated using spreadsheet software.

Focus Group

The project team then held a focus group of staff from what we call “intermediary” organizations—those that may not provide formal training programs, but interact with local decision-makers and provide technical information and assistance on coastal and watershed stewardship practices. A focus group work session is an interactive session where a small group of similar participants (usually 8–14) are engaged for several hours in an exchange of information and ideas (Kreuger 1994, Kreuger and Casey 2000, Kellogg *et al.* 2005).

The focus group had several purposes: to convey the results of the literature search and questionnaire; to collect data regarding participant perceptions of the economic and fiscal aspects of stewardship based on their interaction with local decision-makers; to ascertain their views on the opportunities for enhanced curriculum, partnerships, and outreach activities in the basin; and to ascertain their perceptions about the current needs of local decision-makers and the types of educational and training systems to which they would respond.

Twelve participants represented local and regional planning, natural resource and economic development agencies, and several nonprofit organizations. Their professional careers ranged from four to more than 25 years; the median time in practice was 12 years. The session began with a summary of the literature review and questionnaire results. Next a local nonprofit organization staff member who works on economic benefits and stewardship with local governments presented a case study. Finally, a structured discussion based on the review of academic and practitioner-oriented literature and the results of the telephone questionnaire followed. The session lasted three and one half

hours and was facilitated by the project director. Participant comments were recorded by hand on a newsprint flipchart and through real-time note taking on a laptop by a project team member.

RESULTS

Questionnaire to Training and Technical Assistance Providers

Table 3 summarizes the responses to the questions concerning economic and fiscal benefits on the questionnaire. Most respondents participating in the study provided training, technical assistance, and materials. Figure 4 summarizes the topics provided through these delivery modes.

The strong presence of storm water, wetlands, and floodplain topics for education and training sessions provided is likely due to the sheer number of providers from resource-oriented extension programs (Table 2). The strong presence of university-based extension agents as providers likely explains the presence of economic development and greenway development, as these agents focus on both resource and economic development topics as part of their mission.

The primary audience for training workshops was elected municipal officials and municipal employees, although the wide range of target audiences was much broader than we anticipated. Storm water management and tourism were the topics to which their audiences had been most receptive (Fig. 5).

Regarding their target audiences, training providers noted that public sector participants tended to be more interested in fiscal (tax revenue and public spending) impacts of regulations, the implications for job creation, and economic development. They noted that during workshops, local decision-makers indicated they were more likely to respond to compliance rather than voluntary investment in natural resources. Private land owners tend to be more concerned with privacy and use issues rather than economic aspects of regulation, and private businesses are more interested in how stewardship practices affect their profits.

Most organizations we surveyed do not provide assistance on community capacity-building, although a few offered training on nature-based economic development and developing a watershed vision. We also discovered little provision of training in administrative and planning topics, the exception being some training for watershed planning and conservation.

Overall, respondents reported a growing recogni-

TRAINING OPPORTUNITIES

152

TABLE 3. Summary of responses regarding economic or fiscal benefits topics N = 19.

Question Topic	Results: Number of Respondents Answering "Yes"	
Types of services provided	Educational materials	18
	Training programs/sessions	17
	Technical assistance	18
Most frequent focus of educational materials/training	Stormwater management	9
	Wetlands	8
	Nature and economic development education	7
Top target audiences	Training <i>and</i> informational materials: elected municipal officials and municipal employees. Materials only: federal legislators and federal agency employees	
Top five ranked participant Workshop Interests	Stormwater management	10
	Avoid health hazards (bacteria in water, etc)	10
	Wetlands as flood control	7
	Tourism for economic development	6
	Floodplains	6
Technical Assistance Provided by Respondents 18 of 19 provide technical assistance, primarily in the following areas:	Storm water	11
	Wetlands	10
	Greenway development	9
	Avoiding building in floodplains	8
	Tourism for economic development	7
	Avoiding health hazards	7
	Access to alternative funding sources	6
Entities to which technical assistance on economic or fiscal topics is provided	Local governments	17
	Individual landowners/citizens	15
	State agencies	12
	Non-profits	12
	For-profit consultants	7
Top six ranked resources or assistance for respondents to allow the organization to increase effectiveness	Top ranked was funding support (11 ranked either #1 or #2). Finding professionals to assist them in their training/educational efforts was ranked #1 or #2 by six organizations. (See Figure 4 for details)	

tion among local decision-makers that the health of Lake Erie and its tributary waterways were important for economic growth and quality of life characteristics in the basin. However, across the board there were comments that, in their experience, decision-makers had a short-term view from which to judge benefits and costs and had difficulty seeing how long-term economic or fiscal benefits outweighed short-term costs.

Finally, when asked what resources would assist them in doing a better job, the top-ranked item was funding support (11 out of 19 ranked this #1 or #2). The second most commonly requested resource was professional assistance to help them develop and

deliver their training/educational efforts (six out of 19 ranked this #1 or #2).

We also asked these organizations about their educational materials, training programs, and technical assistance efforts regarding ecological issues in order to establish the relative level of their efforts when compared with efforts focused on economic aspects. The organizations offered a variety of assistance. For ecological topics, technical assistance on terrestrial habitat resource protection, aquatic habitat protection, coastal/riparian habitat protection dominated. Six of the organizations offered both informational materials and training on leadership development, cooperation with neighboring communities, and developing a watershed vision.

FIG. 4. Materials and training offered in the Ohio Lake Erie basin, by economic benefits topic.

FIG. 5. Top ranked workshop interests as indicated by training providers.

Regarding non-economic aspects of Administrative and Planning Assistance, organizations offered informational materials, training, and technical assistance, with the strongest showing for developing watershed plans and maximizing efficiency of community planning. For informational materials and training only, organizations offered topics of management of permit programs, measurement/evaluation of success of management efforts, identification of geographic areas for conservation, data collection/analysis for environmental assessment, and maximize efficiency of community planning. These non-economically oriented training programs, educational materials, and technical assistance were offered by more organizations overall than the economic or fiscal topics.

Focus Group of Technical Assistance Professionals

Focus group participants were asked about their perceptions of decision-maker interests, experience, and needs in the realm of economic and fiscal benefits and costs of coastal and watershed stewardship. These professionals work with local decision-makers on a regular basis in both individual and group settings. Several themes emerged from this discussion, and these are summarized below.

Local Knowledge Base

The participants agreed that most local decision-makers lack understanding of the economic value of resources and their protection. Local decision-makers typically respond to a crisis that destroys or reduces that value or triggers real costs to respond. They agreed that when many decision-makers in the Lake Erie basin *see* the lake, they perceive it as a clean and plentiful resource, with a mindset of “so what is the problem?”

Local Decision-Making Priorities and Factors Shaping Their Decisions

Focus group participants suggested that local decision-maker actions and decisions are most commonly shaped by the money available in their budgets, the political reality of crisis management, an aversion to risk, and the need for compliance with the law. Local decision-makers have a tendency to make economic decisions that are self-beneficial or beneficial to their jurisdictions for the public sector, but these decisions may not be good for the watershed, which they usually do not take

into account. Most decision-makers don’t think about the impact or costs to the community or the region as a whole, and there are no institutional mechanisms or forums in Ohio that encourage them to do that. Participants also stated that most local decisions in the public sector are driven by the need for economic benefit because development is the focus in the Ohio Lake Erie basin.

Participants noted that a crisis-driven, reactive approach to decision-making, rather than a proactive planning approach to change, dominates decisions. Weighing benefits and costs is not generally a method used, and local decision-makers tend not to act proactively regarding situations that have not yet reached a crisis level. The participants suggested that local decision-makers are often averse to risk, either because they are being fiscally prudent or because they wish to preserve their long-term political viability. New ideas are a challenge, and they don’t know if new actions will work out or if citizens will accept them. In this same practical vein, participants agreed that decision-makers respond to enforcement by outside state and federal agencies, and that this is needed to get their attention in many situations.

Mechanisms and Tools For Stewardship

The participants suggested that the highest priority for decision-makers is for financial tools that jurisdictions and landowners could use for stewardship. In particular, participants suggested development of conservation tax credits, similar to those used for historic preservation, might help nonprofit organizations preserve land and suggested the use of tax increment financing schemes to try and “capture the value” of watersheds. The development of legally defensible, innovative land use practices, such as land pooling, in which a group of landowners collectively band together toward a larger vision, was also emphasized, in addition to the need for court rulings to uphold the use of riparian setbacks and other land use regulation as a protective mechanism.

Participants also noted that “dollars are the bottom line for most decision-makers” and that local jurisdictions respond most readily to money. They suggested that receipt of state money in programs that local decision-makers want, such as for transportation, should be tied to water quality protection and stewardship practices.

Best Ways To Get New Knowledge

Participants affirmed that in their experience most local decision-makers have minimal knowledge about coastal and watershed issues, so the information provided to them needs to be very focused and accessible. They suggested giving information that makes the decision “easy” for them, i.e., self-evident that by adopting ecologically-sound stewardship practices they would be making the best economic or fiscal decision for their community.

Participants suggested that the most effective way to convey new information to senior decision-makers is through peer-to-peer exchange of information and experiences. They also recommended bringing decision-makers onsite using “field trips” to allow them to see for themselves the effects of good or bad stewardship practices. In accordance with this, detailing other site-specific examples that they can relate to their own situation is key. If workshops are used to convey information, they need to be very focused and targeted to decision-makers’ specific needs and constraints.

When queried about potential subject gaps in currently available training and materials, participants suggested that supplementing technical assistance might be more critical than additional educational materials. For example, the literature review for this study included research with documented economic benefits; the appropriate task might be to “translate” these into information that is more accessible to decision-makers. This fits with participants’ suggestion that peer-to-peer and on-site experience may be more important than workshops.

Participants also suggested formation of a technical assistance team that could be made available to local decision-makers to help them articulate plans and strategies for local jurisdictions and other decision-makers to use. Participants also emphasized that local examples are critical, in part because decision-makers want to gain insight from the experiences and strategies of others. They suggested that research should quantify the economic value of public actions and public service in the Lake Erie basin to encourage local decision-makers to protect land and water.

ANALYSIS AND CONCLUSIONS

When we compared the matrix of literature in Table 1, which suggests both economic benefits/cost savings and potential training topics, with the results of the training provider questionnaire, we

determined that relatively few of the training topics are covered in the current market among our respondents. Most often the training and materials being delivered are connected to surface water management. In particular, training and outreach around Phase 2 storm water management and flood control were the most frequently identified training topics. This is likely due to the recent regulatory requirements faced by local governments and the efforts among training and educational organizations to assist local governments in developing their storm water management plans for their NPDES permits (U.S.EPA 2005).

Technical assistance offered by responding organizations reflects an emphasis on surface water as well, with floodplains, storm water, and wetlands the most frequent topics. Greenways, tourism for economic development, avoiding health hazards, and identifying funding sources ranked in a second tier for technical assistance. However, for most of the topics, a minority of the respondents provides technical assistance, and those that do most often provide technical assistance to local governments and individual landowners.

In terms of the organizational needs of the training providers, respondents cited additional funding, professional expertise, and additional curriculum as their greatest training delivery needs. The need for professional expertise and new curriculum is not surprising, given that most of the organizations interviewed are primarily focused on ecological resources stewardship directly and are now venturing into the economic and fiscal aspects of stewardship to respond more effectively to client needs. (This is not the case, however, for agents in the Ohio Sea Grant Program, whose mission has always been economic development and resource protection together.) The results do suggest an opportunity to improve the training/educational outreach system around economic and fiscal aspects of stewardship through the creation of partnerships or collaborative arrangements among organizations and with universities, which are a likely source of professional expertise and curriculum.

An important question that remains is whether the “gaps” in training opportunities in the Ohio Lake Erie basin reflect the perceptions of training and technical assistance providers (their assessment of what local decision-makers need), exist as a result of a lack of demand overall, or constitute an unmet market demand. This question can only be answered by additional research that obtains input directly from local decision-makers on a suffi-

ciently wide geographic scale and in sufficient number.

The results of the focus group suggest additional research to document the economic/fiscal benefits and costs to existing practices in the Lake Erie basin to provide case studies and examples of peer-to-peer approaches for local decision-makers. Our results also suggest a need for increased collaboration among training providers and educational institutions in the Lake Erie basin to focus on economic and fiscal aspects of land use change and coastal and watershed stewardship. Such collaboration might develop case studies or fact sheets of benefits and costs and might assemble the technical advisory network concerning economic benefits and costs that the focus group participants suggest would provide a useful service. One likely set of collaborators are the urban and rural university programs, which are both working with client audiences responding to land use change and impacts. Finally, universities and training and technical assistance providers should consider a regional or basin-wide forum on these issues, highlighting success stories in stewardship practices from which decision-makers can learn.

Future research will focus on local decision-makers themselves to identify and assess their perceptions of economic benefits of stewardship and identify their knowledge needs and key knowledge-building mechanisms that will, as our focus group participants noted, make it "easier" for them to make decisions that lead to better stewardship practices.

REFERENCES

- Adams, C. 1988. *The economics of coastal tourism and research perspectives for Florida: A workshop proceedings*. Florida Sea Grant College Program. University of Florida. Sea Grant Technical Paper 54, November.
- Acharya, G. 2000. Approaches to valuing the hidden hydrological services of wetland ecosystems. *Ecological Economics* 35:63–74.
- Arendt, R. 1996. *Conservation Design for Subdivisions: A Practical Guide to Creating Open Space Networks*. Washington, DC: Island Press.
- Bolund, P., and Hunhammar, S. 1999. Ecosystem services in urban areas. *Ecological Economics* 29: 293–301.
- Bower, B., and Turner, R.K. 1998. Characterizing and analyzing benefits from integrated coastal management (ICM). *Ocean and Coastal Management* 38:41–66.
- Branch, M. 1998. *Comprehensive Planning For The 21st Century: General Theories And Principles*. Westport, CN: Praeger.
- Cangelosi, A., ed. 2001. *Revealing the Economic Value of Protecting the Great Lakes*. Washington, D.C: Northeast-Midwest Institute and the National Oceanic and Atmospheric Administration.
- Center for Watershed Protection. 1998. *Better Site Design: A Handbook For Changing Development Rules In Your Community*. Ellicott City, Maryland: Author.
- Costanza, R. 2000. Social goals and the valuation of ecosystem services. *Ecosystems* 3:4–10.
- , and Folke, R. 1997. Valuing ecosystem services with efficiency, fairness and sustainability as goals. In *Nature's Services: Societal Dependence On Natural Ecosystems*, ed. G. Daily, pp. 49–70. Washington, DC: Island Press.
- , d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R., Paruelo, J., Sutton, P., and vanden Belt, M. 1997. The value of the world's ecosystem services and natural capital. *Nature* 387(15):253–260.
- Daily, G. editor. 1997. *Nature's Services: Societal Dependence On Natural Ecosystems*. Washington, DC: Island Press.
- . 2000. Management objectives for the protection of ecosystem services. *Environmental Science and Policy* 3:333–339.
- Day, J., Ko, J., Rybczyk, J., Sabins, D., Bean, R., Berthelot, G., Brantley, C., Cardoch, L., Conner, W., Day, J., Englande, A., Feagley, S., Hyfield, E., Lane, R., Lindsey, J., Mistich, J., Reyes, E., and Twilley, R. 2004. The use of wetlands in the Mississippi Delta for wastewater assimilation: a review. *Ocean and Coastal Management* 47:671–691.
- Dowden, L., and McNurney, J. 1995. *Municipal Environmental Compliance Manual*. Boca Raton, FL: Lewis Publishers/CRC Press.
- GLEFC (Great Lakes Environmental Finance Center). 2002. *Coastal training market analysis: survey results*. Cleveland: Cleveland State University. Available at URL: <http://urban.csuohio.edu/glefc/publications.htm>.
- Gustavson, K., Lonergan, S., and Ruitenbeek, J. 2002. Measuring contributions to economic production—use of an Index of Captured Ecosystem Value. *Ecological Economics* 41(3):479–490.
- Hartig, J., and Law, N. 1994. *Progress in Great Lakes remedial action plans: Implementing the ecosystem approach in the Great Lakes areas of concern*. Document 905-R-24-020. Washington, D.C.: United States Environmental Protection Agency.
- Heal, G. 2000. Valuing ecosystem services. *Ecosystems* 3:24–30.
- Holmes, T., Bergstrom, C., Huszar, E., Kask, S., and Orr, F. 2004. Contingent valuation, net marginal ben-

- efits, and the scale of riparian ecosystem restoration. *Ecological Economics* 49(1):19–30.
- Hopkins, L. 2001. *Urban Development: The Logic of Making Plans*. Washington, DC: Island Press.
- Howarth, R., and Farber, S. 2002. Accounting for the value of ecosystem services. *Ecological Economics* 41:421–429.
- Johnson, N., and Baltodano, M. 2004. The economics of community watershed management: Some evidence from Nicaragua. *Ecological Economics* 49(1):57–71.
- Kellogg, W. 1997. Metropolitan growth and the local role in surface water resource protection in the Lake Erie basin. *J. Great Lakes Res.* 23:270–285.
- , Tevesz, M., Robey, C., O'Brien, K., McGoun, M., Toth, K., and BaracsKay, D. 2005. Training needs of coastal resources decision-makers in Ohio's Lake Erie basin. *Coastal Management Journal* 33(3):335–351.
- Kemp, R. ed. 1995. *Economic Development In Local Government: A Handbook For Public Officials and Citizens*. Jefferson, N.C.: McFarland & Co.
- Knowler, D., MacGregor, B., Bradford, M., and Peterman, R. 2003. Valuing freshwater salmon habitat on the west coast of Canada. *Journal of Environmental Management* 69(3):261–273.
- Kreuger, R. 1994. *Focus groups*, 2nd ed. Thousand Oaks, CA: Sage.
- , and Casey, M. 2000. *Focus Groups: A Practical Guide For Applied Research*, 3rd ed. Thousand Oaks, CA: Sage.
- Lindsey, G., and Knaap, G. 1999. Willingness to pay for urban greenway projects. *Journal of the American Planning Association* 65(3):297–313.
- Loomis, J., Kent, P., Strange, L., Fausch, K., and Covich, A. 2000. Measuring the total economic value of restoring ecosystem services in an impaired river basin: Results from a contingent valuation survey. *Ecological Economics* 33:103–117.
- Marsh, W. 1998. *Landscape Planning: Environmental Applications*, 3rd ed. New York: John Wiley & Sons.
- Mays, N. 2003. Local benefits from cleaning contaminated sediments. *Northeast Midwest Economic Review*. Fall. Washington, D.C.: Northeast-Midwest Institute.
- Morgan, C., and Owens, N. 2001. Benefits of water quality policies: The Chesapeake Bay. *Ecological Economics* 39(2):271–284.
- Norberg, J. 1999. Linking nature's services to ecosystems: Some general ecological concepts. *Ecological Economics* 29:183–202.
- OLEC (Ohio Lake Erie Commission). 2000. *Lake Erie Restoration and Protection Plan*. Toledo: OH: Author. Available at URL: <http://www.epa.state.oh.us/oleo/reports/lepr/lepr/lepr.htm>.
- . 2004. *Linking Land Use and Lake Erie: A Planning Framework for Achieving Balanced Growth in the Ohio Lake Erie Watershed*. Toledo: Author. Available at URL <http://www.epa.state.oh.us/oleo/BGIPF.pdf> (accessed January 2006).
- Raab, R., and Steinnes, D. 1979. *Economic Benefits and Costs of Recreational Smelt Fishing to Duluth, Minnesota*. Sea Grant Research Notes. University of Minnesota Sea Grant Program
- Schueler, T. 1997. The economics of watershed protection. *Watershed Protection Techniques* 2(4) (June). Ellicott City, MD: Center for Watershed Protection.
- Shrestha, R., and Alavalapati, J. 2004. Valuing environmental benefits of silvopasture practice: a case study of the Lake Okeechobee watershed in Florida. *Ecological Economics* 49(3):349–359.
- SOLEC (State of the Lakes Ecosystem Conference). 1994, 1996, 1998. Conference Documents. Available at <http://www.epa.gov/grtlakes/solec/index.html> (accessed October, 2005).
- Spence, W.R. 1994. *Innovation: The Communication of Change In Ideas, Practices and Products*. London: Chapman & Hall.
- Stokoe, P. 1993. *Development potential and other benefits from restoration, enhancement and protection of Great Lakes basin watersheds: Final report*. A report by Hickling Corporation for Environment Canada. Toronto: Hickling Corporation.
- U.S. Census. 2004. Population Estimates 2004 for Ohio's Counties. Retrieved from Northern Ohio Data Information Service "Demographic Profiler" URL http://nodisnet1.csuohio.edu/nodis/2000reports/2000SF3_profs/maps.shtml#counties. (accessed October 2005).
- U.S.EPA (United States Environmental Protection Agency).1992. *Protecting Coastal and Wetlands Resources: A Guide for Local Governments*. Washington, D.C.: Office of Water/Office of Wetlands, Ocean and Watersheds/Office of Policy, Planning and Evaluation. EPA #842-R-92-002.
- . 2000. *Guidelines for preparing economic analyses*. Washington, D.C.: Office of the Administrator. Document # EPA 240-R-00-003.
- . 2002. Lakewide management plans. (*Fact Sheets*). <http://www.epa.gov/glnpo/gl2000/lamps/index.html> (accessed October 2005).
- . 2005. Storm Water Program, NPDES. Washington, D.C.: Office of Water. Available at URL <http://cfpub.epa.gov/npdes/stormwater/swphases.cfm> (accessed October 2005).
- Woodward, R., and Wui, Y. 2001. The economic value of wetland services: a meta-analysis. *Ecological Economics* 37(2):257–270.