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# Extension Forestry in the United States: Master Volunteer and Other Peer-Learning Programs

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Extension Forestry has long acted as a medium for landowner education and engagement through a variety of programs that encourage peer learning. We describe recent trends and innovations in Extension Forestry programming by reporting the results of surveys and focus groups with the managers of 39 (of 42 identified) Extension Forestry master volunteer and other peer-learning programs. These programs combine instruction from experts with peer learning and volunteerism to provide nonformal adult education for family forest owners. Results indicate that Extension Forestry peer-learning programs are evolving to address emerging issues and to use recent developments in communication and educational technologies, such as online programming and social media. With median annual budgets of just over \$10,000, several programs target small and often underserved segments of the landowner population, such as women and absentee landowners. Although program outputs and demands for service are increasing, many program managers face reduced budgets and a variety of challenges to program sustainability.

**Keywords:** peer-to-peer, peer exchange, landowner, education, private lands, nonindustrial private forest, communications

The Extension Forestry system has long been the primary source of ongoing, nonformal land management education for private forest landowners in the United States (Reed et al. 1997, Jones et al. 2001). This system consists of federal, state, and local partners, together “using a variety of educational methods suited to the learners” (Reed et al. 1997, p.118). Traditionally, some of these methods have focused on expert instruction; however, some have suggested the need

to diverge from a one-way, expert-driven educational model (Ma et al. 2012) toward models more firmly grounded in the principles of adult learning (Knowles et al. 2005, Kueper et al. 2013). An alternative educational method that has been employed by Extension for at least 30 years is the use of peer learning to leverage personal contacts through landowner networks (Fletcher and Reed 1996). Peer learning can be understood as the “exchange of ideas and information among landowners and

family, friends, neighbors, and other landowners, which is contrasted with the largely one-way delivery of content through expert-centric education models commonly employed in landowner outreach” (Kueper et al. 2013, p. 2). This approach may engage landowners not reached through other Extension program models (Finley and Jacobson 2001, Allred et al. 2011, Kueper et al. 2013).

One popular method for using peer learning and personal networks for landowner education is the master volunteer (MV) model. The MV model is grounded in Rogers’ Diffusion of Innovations theory, where knowledgeable peers influence others’ adoption of certain practices (Rogers 2003). Diffusion of Innovations theory has been applied to private forest management in a number of studies (e.g., Doolittle and Straka 1987, West et al. 1988, Korhonen et al. 2012) and underpins much Extension Forestry programming. As a prominent example, MV programs train interested individuals to disseminate information and educate their peers about land management options and sources of financial or technical assis-

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tance, providing personal contact for landowners.

Peer volunteers tend to be trusted and more accessible to landowners than natural resource professionals, whom landowners sometimes view as having conflicting agendas (Rickenbach et al. 2005, Davis and Fly 2010, Gootee et al. 2010). Furthermore, peer influence has been shown to directly and indirectly affect landowner goals and behavior, e.g., through conversation with neighbors or observation of neighbors' lands (Schubert and Mayer 2012), and to motivate action on private forestland (Egan and Jones 1993). Facilitating peer-learning opportunities is one of the most common learner-focused practices used by North American Extension foresters (Johnson et al. 2007). Landowners in Connecticut who had been visited by a peer volunteer were more likely to join a conservation organization or seek out forestry information, implement wildlife habitat improvement practices, or obtain a written forest management plan (Snyder and Broderick 1992). Similarly, landowners contacted by a Master Woodland Manager in Oregon felt better equipped to make future land management decisions and reported having clearer goals and values after the visit (Fletcher and Reed 1996).

While there have been state-level reviews of Extension Forestry programs (e.g., Barden et al. 1996, Jones et al. 2001, Londo 2004), we are aware of no prior nationwide review of Extension Forestry MV or other peer-learning (OPL) programs in the United States. Recognizing the important role of landowner education in other interventions designed to encourage sustainable family forest management, we report on recent trends and innovations in identified Extension Forestry peer-learning programs across the United States. Our specific research objectives were to: identify Extension Forestry MV and OPL programs nationwide that target family forest owners; characterize these programs in terms of delivery method, curriculum, audience, partnerships, budgets, and evaluation metrics; and describe trends in these programs by identifying recent and expected changes to program implementation.

## Methods

This article presents part of a larger study that included an online survey of all 50 state-level Extension Forestry program leaders in the United States (phase 1: see Sagor et

al. 2014), online surveys of MV and OPL program managers (PMs) in the United States (phase 2), and telephone-based focus groups of selected survey respondents (phase 3). This article addresses data collected from MV and OPL PMs via the online surveys and focus groups (phase 2, portions of phase 3).

In the phase 1 online survey, 50 state-level Extension Forestry program leaders were asked to identify their MV programs as defined by certain criteria; the programs

- were offered by Extension or through a collaboration of Extension and partners,
- primarily targeted family forest owners,
- provided education on forest management, and
- either required or encouraged active volunteerism after completing the program.

Program leaders were also asked to identify any other programs offered by Extension for family forest owners that did not have an explicit volunteer and/or educational component but that were designed to encourage landowners to teach and learn from one another—formally or informally—through the exchange of knowledge, experiences, and ideas. These programs are referred to as OPL programs.

Between February and April 2012, we administered separate surveys to MV and OPL PMs using a five-step protocol based on the Tailored Design Method (Dillman et al. 2009) that included mail, e-mail, and telephone communications. Questions for both groups addressed program for-

mat, partnerships, administration, evaluation, revenue sources, and innovations. Presented with a list of 21 topics, respondents used a five-response scale to indicate whether their MV programs were now providing more, less, or the same amount of instruction on those topics compared to 5 years prior to the survey. A similar scale was used to indicate changes in the use of 12 content delivery and instructional formats. MV PMs also indicated whether a variety of important metrics related to program demand, inputs (e.g., marketing, staff effort), and outputs (e.g., number of active volunteers, volunteer contributions) had declined or grown over the same time period. Results for all of these questions are based on respondents' recall of their program activities 5 years prior to the current survey. The MV program survey examined curriculum content and volunteer management, while the OPL program survey included more detailed questions on opportunities for peer exchange. One-way analysis of variance (ANOVA) was used to test for differences among subgroup responses. Both surveys also included an open-ended question to identify up to three of the most important changes expected to be implemented to programs over the next 5 years.

We also administered focus groups to provide additional context on themes identified in the online surveys. Twenty-eight of the 32 responding PMs indicated their willingness to participate in a focus group. These individuals formed the participant pool for three focus groups consisting of: (1)

## Management and Policy Implications

Family forest owners control about 35% of the nation's forestland. Landowner education, primarily delivered through the nation's Extension Forestry system, underlies a broad suite of investments and interventions to encourage sustainable private forest management. Educational models that leverage personal contacts via peer exchange through landowner networks are common within Extension Forestry programs: At least 39 master volunteer and other peer-learning programs in the United States deliver forest management, wildlife habitat improvement, and related content directly to landowners and indirectly to others through personal networks. These programs leverage small, largely grant-funded budgets and numerous partnerships to accomplish these outreach efforts. By mobilizing trained landowners, these programs use personal contact through trusted, accessible sources to deliver information to other landowners. While these programs are evolving to address emerging issues, their managers face a number of challenges to long-term program sustainability. However, the important role of landowner education in encouraging sustainable private forest management suggests that peer-learning programs will continue to be an important and prevalent piece of the Extension Forestry toolkit. Further, the findings from this study may be used by state-level Extension Forestry systems nationwide to inform present and future landowner programming efforts.

**Table 1. Extension Forestry Master Volunteer programs in alphabetical order by state.**

Program name	Host institution	State	Year first offered	# Trained per year	# Active volunteers
Master Tree Farmer	University of Arkansas	AR	2000	40–49	
Coverts Project	University of Connecticut	CT	1983	20–29	100–199
Community Forest Stewards	University of Florida	FL	2008	10–19	25–49
Master Woodland Manager	Iowa State University	IA		30–39	100–199
Master Forest Stewards	University of Idaho	ID	2009	10–19	25–49
Keystone	University of Massachusetts Amherst	MA	1988	20–29	200–299
MD Woodland Stewards	University of Maryland	MD	1991	20–29	100–199
Master Woodland Steward	Michigan State University	MI	1992	20–29	<25
Woodland Advisor	University of Minnesota	MN	1988	<9	100–199
MO Woodland Steward	University of Missouri	MO	2006	70+	50–99
Master Forest Steward/Tree Farm	Montana State University	MT	2004	60–69	100–199
NH Coverts	University of New Hampshire	NH	1995	20–29	100–199
NJ Woodland Stewards	Rutgers University	NJ	2010	<9	<25
Master Forest Owner	Cornell University	NY	1991	10–19	200–299
Master Woodland Manager	Oregon State University	OR	1982	20–29	200–299
Land Stewards Program	Oregon State University	OR	2009	20–29	50–99
PA Forest Stewards	The Pennsylvania State University	PA	1991	20–29	400–499
COVERTS	University of Rhode Island	RI	2006	20–29	50–99
Master Tree Farmer	Clemson University	SC	1980	70+	100–199
Master Wildlifer	Clemson University	SC	1995	70+	50–99
Coverts Project	University of Wisconsin Madison	WI	1994	30–39	400–499
Master Woodland Steward	University of Wisconsin Stevens Point	WI	2002	10–19	200–299

**Table 2. Other Extension Forestry peer-learning programs in alphabetical order by state.**

Program name	Host institution	State	Year first offered	# Trained per year
Women Woodland Owners	University of Arkansas	AR	2008	<25
Ties to the Land	University of California	CA	2011	200–299
Mentorship Program	Colorado State University & Cons. Districts	CO	2012	<25
Forest Stewardship Short Course	University of Connecticut	CT	1998	25–49
Forest Stewardship Program	Florida Forest Service & University of Florida	FL	1992	500+
Parish Forest Landowner Assocs.	Independent, with Louisiana State University	LA	1985	300–399
Minnesota Women's Woodland Network	University of Minnesota	MN	2009	300–399
Montana Tree Farm	American Forest Foundation.	MT	1941	400–499
Wildfire Awareness Program	University of Nevada	NV	1997	200–299
Women Owning Woodlands Network	Oregon State University	OR	2005	300–399
PA Woodland Owner Assocs.	The Pennsylvania State University	PA	1986	500+
SC County Landowner Assocs.	Independent, with Clemson University	SC		500+
VA Forest Landowner Educ. Program	Virginia Polytechnic University	VA	1996	500+
Ties to the Land	Wisconsin Woodland Owners Association	WI	2010	50–99
WI Woodland Advocates Program	Wisconsin Family Forests, Inc.	WI	2008	25–49
WI Woodland Leadership Institute	University of Wisconsin - Stevens Point	WI	2001	100–199
WV Woodland Stewards	West Virginia University	WV	2002	50–99

MV PMs (five participants), (2) OPL PMs (five participants), and (3) a mixture of MV and OPL PMs whose programs targeted specific family forest owner audience segments (four participants). Each focus group consisted of a 90-minute telephone conference call with one moderator and one or two note takers. We administered and recorded the telephone focus groups using the methods outlined by Brown et al. (2012) and Krueger and Casey (2008). Data collection protocols were approved by the Institutional Review Board at the University of Minnesota. Questions were provided to participants in advance. After introductory statements by the moderator and participants, the moderator encouraged a conversational and informal tone. Questions addressed topics such as

strengths and barriers to program success, unique aspects of programs, the influence of digital media and funding sources on program operation, and challenges and successes with motivating peer leader involvement and program evaluation.

Qualitative data from the open-ended survey questions were thematically coded by hand using open coding to identify patterns (Schubert and Mayer 2012). Focus group transcriptions were similarly analyzed; the list of codes was developed from focus group questions, preliminary analysis of survey data including emergent themes from the open-ended data (e.g., funding issues, opportunities and risks associated with digital media), and themes arising from preliminary examinations of transcripts. Coded ma-

terial was then summarized into descriptive themes for each focus group, which were compared and contrasted across all three PM focus groups.

## Results

State-level Extension Forestry program leaders identified 23 qualifying MV programs and 19 qualifying OPL programs; the PMs of all 42 qualifying programs were surveyed. We received usable surveys from the managers of 22 MV programs in 19 states and 17 OPL programs in 15 states for a total of 39 programs from 25 states and a 93% overall response rate.

Tables 1 and 2, respectively, list the 22 MV and 17 OPL programs for which we received completed surveys. Among states

**Table 3. Audiences targeted by forestry-related MV (n = 22) and OPL (n = 17) programs. Audience categories are nonexclusive and several programs target multiple audiences.**

Audience targeted	Number (%) of MV programs	Number (%) of OPL programs
All family forest owners	18 (82%)	10 (59%)
Small acreage family forest owners	9 (41%)	4 (24%)
Large acreage family forest owners	8 (36%)	3 (18%)
Women family forest owners	6 (27%)	5 (29%)
Family forest owners by land location	6 (27%)	1 (6%)
Family forest owners by residence location	5 (23%)	4 (24%)
Family forest owners from specific ethnic groups	3 (14%)	4 (24%)
Other audiences	6 (27%) <sup>a</sup>	3 (18%) <sup>a</sup>

<sup>a</sup> “Other” for MV programs included community decisionmakers and leaders, motivated individuals regardless of land ownership status, and landowners with a management plan. “Other” for OPL programs included homeowners (very small parcel residential owners) and audiences based on specific criteria not provided.

with one or more such program, on average about 10% of total Extension Forestry staffing capacity was dedicated to the program(s) based on reported full-time equivalent figures. MV programs had been offered for an average of almost 16 years, with the oldest first offered in 1983.

### Target Audiences and Program Content

While most programs reported targeting all family forest owners, many reported that they also target specific subgroups within this large and diverse population (Table 3). Small- and large-acreage owners were the two most common family forest owner subgroups targeted by MV programs. Women, small-acreage landowners, landowners by residence location, and landowners from specific ethnic groups were the most common target audiences for OPL programs. At least one OPL program specifically targeted leaders in the landowner community.

Initial training required for the MV programs ranged from less than 20 up to 85 hours. Seventeen of 22 MV programs required 20–50 hours of training to become recognized as a volunteer. Only five programs required annual continuing education for trained volunteers. In terms of content, the majority of MV programs addressed forest stewardship and management. Five programs focused primarily on wildlife; four of these used the “Coverts” title, a project first started in 1983 for landowners and community members interested in wildlife habitat conservation (Broderick et al. 1999). Maryland’s Woodland Stewards Program and Florida’s Community Forest Stewards program focused on small residential woodlots and urban forests, respectively.

Over the last 5 years, MV programs seem to have broadened the content delivered to participants beyond traditional forest management topics. Topics for which instruction had increased in the most programs included forest health, climate change, invasive species, and wildlife management. By contrast, instruction on management-oriented topics (e.g., selling timber, general silviculture, tree identification, tree-planting) was more likely to have declined (Figure 1). While the OPL program survey did not include specific educational content questions, OPL programs tended to be fairly broad in content, particularly where their primary focus was on engaging specific audiences; however, some addressed focused topics like intergenerational land transfer (e.g., Ties to the Land programs) or wildfire awareness (e.g., University of Nevada’s Wildfire Awareness Program).

### Instruction and Delivery Formats

Master volunteer programs are shifting away from in-person gatherings and toward digital communications. The four delivery formats that have increased the most among MV programs in the last 5 years were all digital, while four of the six delivery formats that have declined all involve in-person instruction (Figure 2). This was confirmed by open-ended survey responses about planned future changes for both MV and OPL programs, in which the transition toward digital content was an important theme (identified by 10 of 34 programs that responded to this question). In most of these cases they planned to use digital media to enhance communications with trained volunteers rather than as an alternative platform for the initial training, although both were mentioned; for example, one Rocky Mountain

PM indicated planning “a slight increase in online programming as younger and more computer savvy generations acquire land.” Examples of digital media mentioned during the focus groups include: social networking sites such as Facebook, Twitter, Ning, and YouTube; digital forums; landowner listservs; webinars; and e-newsletters. Several focus group PMs also discussed the potential to leverage digital media to reach new or currently underserved audiences, including the younger generation, people who live far from class locations, and the general public; as one West Coast PM noted, “it’s convenient, you do it on your own time ... when you can fit it in versus spending all of Saturday at a workshop.”

Focus group participants viewed digital communications as a good way to keep landowners engaged after a program was over and to efficiently deliver timely information to learners. However, they also noted that digital media required a lot of time to manage and felt that their audiences varied in their interest in digital communications. While some—especially younger landowners—were receptive, others were less so or faced barriers to access. Finally, some expressed concern about using digital media as a replacement for face-to-face interaction with agents and peers or for time spent in the woods, noting the importance of these sorts of activities and the desire not to lose the “personal touch”:

They can sit in a chair and look at stuff on [a] computer... but I think the thing that really gives them energy to do things... is time spent out in the woods. And if that’s with their peer forest owners, and they’re learning... from each other, you know I think that’s where the strengths really are of... Master Volunteer programs. [an MV PM]

### Partnerships and Funding

Finding and maintaining consistent funding was a common challenge. As one focus group PM put it, “I’m 100% on soft money, so it’s very difficult finding... funding to make it happen. And so, continuation of the program is highly problematic at this point.” Some programs had access to funding due to the perceived local importance of their particular topical focus, such as one group that focused on wildfire prevention; however, others struggled to gain similar recognition, and, thus, funding. Fourteen of 37 programs reported declining budgets over the past 5 years, while only eight programs reported increasing budgets. Exclud-



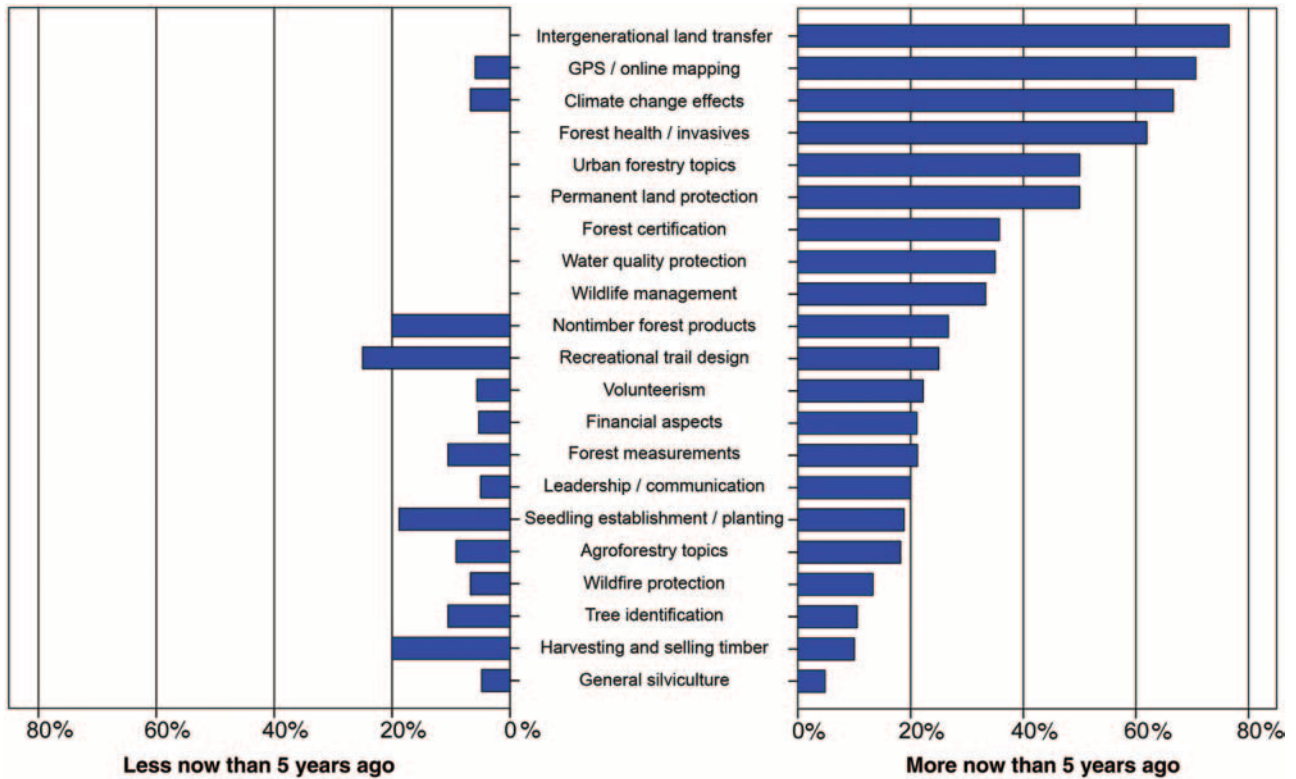


Figure 1. The percentage of 22 Extension Forestry Master Volunteer programs teaching specified topics more (right) or less (left) frequently at the time of the survey than 5 years prior.

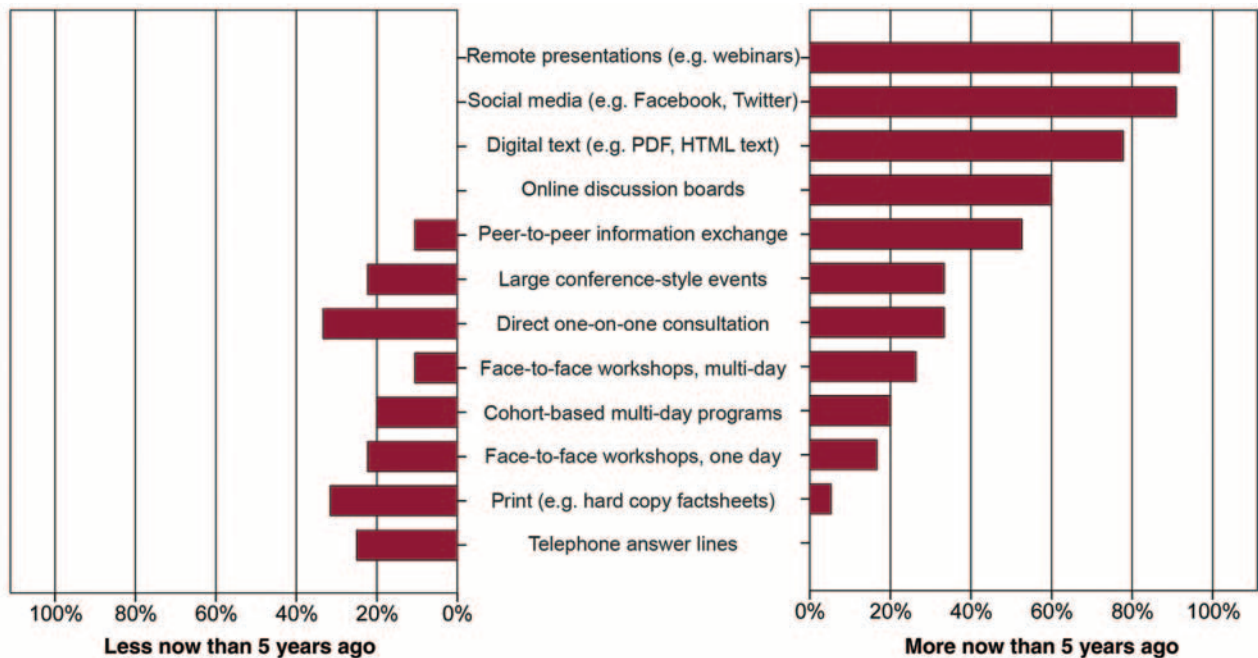


Figure 2. The percentage of 22 Extension Forestry Master Volunteer programs using specified communication and instructional formats more (right) or less (left) at the time of the survey than 5 years prior.

ing staff salaries, reported annual budgets of MV programs ranged from \$0 to \$50,000 with an average of \$12,875 (sd = \$12,260) and a median of \$10,000, while OPL programs ranged from \$0 (two programs) to

\$55,000, with an average of \$10,420 (sd = \$13,890) and a median budget of \$6,000.

With the exception of staff salaries, MV program budgets were virtually 100%

funded by grants and other external funds. Nineteen of 22 MV programs relied on a single external funding source for 50% or more of their annual budget, leaving those organizations vulnerable to loss of that fund-

**Table 4. The number of Master Volunteer ( $n = 22$ ) and other peer-learning programs ( $n = 17$ ) receiving revenue from five common funding sources.**

Percent of annual budget	Forest Stewardship Program	Renewable Resources & Extension Act	Registration fees	Conservation orgs	Other grants
None	27	27	12	28	14
1–19%	0	3	15	7	4
20–49%	4	7	3	3	7
50% or more	8	2	9	1	14
Mean % budget <sup>a</sup> (sd)	16.7% (29.3)	11.2% (22.6)	23.3% (32.2)	4.4% (9.9)	34.3% (39.2)

<sup>a</sup> Figures do not total 100% because programs are not fully funded by these five sources.

**Table 5. Number of partner organizations by partner type and contribution type for Master Volunteer ( $n = 22$ ) and other peer-learning programs ( $n = 17$ ).**

Partner type	Any contribution	Curriculum development and delivery	Financial support	Program planning	Volunteer mgt.
University	52	48	26	43	26
Landowner association	27	7	11	19	10
Conservation or other natural resource district	8	8	4	7	3
Federal agency	20	8	7	11	1
State agency	42	28	17	31	6
Trade or industry group	16	8	8	12	3
Conservation or environmental group	15	5	8	9	5
Other	6	2	4	2	1
Total	186	114	85	134	55

Note: Host organization was automatically populated by the survey software to the respondent's list of partners. These consisted largely of university Extension services.

ing for future program offerings (Table 4). Two particularly important sources of funding for MV programs were the Forest Stewardship Program (FSP) and Renewable Resources and Extension Act (Renewable Resources Extension Act [RREA]). Fourteen programs depended on one of these sources for 10% or more of their annual operating budgets, including six dependent on these sources for 50% or more. Budgets for OPL programs relied more heavily on registration fees and less on all other sources of funding (e.g., FSP, RREA, other grants) (Table 4).

While most programs generated revenue through registration fees, these often contributed only minimally toward covering costs. Enrollment fees for MV programs ranged from \$0 (four programs) to \$450, with half charging less than \$100. OPL program fee structures were more difficult to compare. Some programs charged \$10–125 per workshop or similar event, while others charged a single fee for a series of events, more like the MV model. In general, fees appeared to be lower for OPL than MV programs.

Regardless of program type, some focus group participants felt that charging fees en-

couraged commitment to the program; however, others saw these revenue opportunities as limited. One expressed concern that charging a higher fee would reduce her ability to capitalize on the “*quid pro quo*” factor created by free or inexpensive education that encouraged volunteer participation for years into the future. Related to budget restrictions, a shortage of staff was a common problem; one program had not been offered for 2 years after the university lost volunteer management capacity. In fact, PMs were frequently the only staff dedicated to the program and often only part-time despite increasing management requirements with annual growth in graduates and volunteers. One northern MV PM mentioned in the survey that the “group of volunteers gets bigger each year but staff time remains the same.”

Partnerships were important to the viability and management of the programs. The mean number of contributing partner organizations had increased over the previous 5 years, with 18 of 38 programs reporting an increase and only five reporting a decrease. An average of 4.8 organizations contributed per program, including the host organization. Sixteen respondents each

listed six partner organizations, the maximum number that could be identified, suggesting the possibility that more are involved. State and federal agencies, landowner associations, and other nongovernmental groups were among the most common partners (Table 5). Programs whose budgets had increased over the previous 5 years reported an average of 5.75 contributing partners, significantly more than the 4.5 partners reported by programs whose budgets had declined ( $P < 0.05$ ).

Partners support programs in a variety of different ways. Table 5 presents data on specific types of contributions by partner organizations. Among those specific contributions, programs were most reliant on partners for financial support: 15 of 36 programs reported depending exclusively on partners for financial support, excluding program staff salaries. When analyzing the number of partners by contribution type, only one difference was statistically significant: programs with increasing budgets reported an average of 3.25 partners contributing financially, significantly more than the 2.0 for programs with declining budgets ( $P < 0.05$ ).

Focus group participants indicated both advantages and disadvantages to their partnerships. While some PMs mentioned other landowner groups as a resource for recruiting members, one also mentioned competing with them for landowners' time. State agencies were a necessary partner for some programs, but a couple of PMs mentioned challenges with managing these relationships. However, these partnerships were critical to program viability. Concerned about losing a key program partner, one PM discussed that partner's importance:

The program... relies on an external partner to do that volunteer management.... I know without that there's no way I could do this work. I mean, I don't have time in the day, I don't have a staff person to do that for me.

### Volunteers, Peer Learning, and Peer Leadership

While volunteer service was encouraged in all 22 MV programs, it was required by only seven. Most programs focused the initial volunteer training on a small group; only seven trained more than 30 new volunteers annually, with three (Clemson University's Master Tree Farmer and Master Wildlifer, and the University of Missouri's Woodland Steward) training 70 or more annually. However, 13 of 21 MV programs that re-

**Table 6. Examples of most common MV ( $n = 22$ ) volunteer activities and related OPL ( $n = 17$ ) participant peer-to-peer activities.**

Activity	MV volunteers	OPL participants	Total
Leading tours or hosting events	21	13	34
Property visits to landowners (for OPL programs, this also includes other interactions with landowners outside of program events)	16	9	25
Serving as guest speakers, teachers, or discussion leaders	13	13	26
Relevant youth education/outreach	19	n/a	19
Board members of landowner associations	17	n/a	17
Working booths or tables at fairs or other events	14	n/a	14
Answering landowner phone calls or emails	9	n/a	9

Note: n/a indicates that OPL participants were not asked about this item; corresponding OPL activities are drawn from a close-ended question about how peer learning was fostered in OPL programs.

sponded to a question about active program graduates report 100 or more active volunteers (i.e., those who have volunteered any amount of time in the last year), suggesting that volunteers remain active for several years after the initial training. Six programs reported over 200 active volunteers and two (Penn State University's Forest Stewards and the University of Wisconsin's Coverts Project) reported over 400 active volunteers. While volunteering was generally not required in OPL programs, many had unstructured opportunities for participants to volunteer. Additionally, some OPL PMs noted how they had observed peer exchange developing organically among learners during events; as stated by an East Coast PM:

Well..., some people are going to be more experienced than others, and some people are going to be quicker to pick up certain things than others. And so there's a kind of a mutual helpfulness going on once the class becomes established and we're moving through the topic areas.

Both MV and OPL program participants were active in a broad diversity of volunteer activities; while as mentioned most OPL programs did not have a structured volunteer component, many fostered peer-to-peer interaction through similar activities. One of the most common activities was hosting or leading property tours, which was reported by 34 programs (Table 6). Focus group participants were nearly universal in their support of volunteer-led property tours, with one even teaching a class on how to do it. Other common activities included serving as guest speakers, teachers, or discussion leaders and property visits or other interactions with landowners outside of program events. One focus group PM noted that the main goal of the program was to get volunteers to connect landowners with professionals; these volunteers were advertised

to the local community as a resource. Peer leaders were identified by tapping into existing landowner organizations and by receiving recommendations from previous participants.

Focus group participants saw great value in peer learning, reporting benefits such as freeing up time for agency staff; energizing participants; breaking down the hierarchy of the group and increasing learner confidence; and gaining access to new learners through peers' personal networks. As one Midwestern PM put it:

I would say over half of the evaluations... will have... comments... about the value of learning from other landowners, that they learned just kind of what works what doesn't work from just talking during the down time or the... evening sessions. So, that's... why we're doing the format we are.

At least one successful MV program, the Idaho Master Forest Owner Program, was developed with substantial leadership and involvement of the landowner graduates of an Extension short course.

However, barriers to peer learning were reported as well, including the time commitment to facilitate peer learning, the risk of misinformation, supplanting lecture time, and hesitation by some learners to lead. A southern MV PM also noted how some landowners may be unable to relate to "model" landowners:

You know they have an equipment garage full of every piece of equipment you can possibly imagine, and [they seem to know everybody]. It's just really hard for most landowners, I think, who don't have those kinds of resources to relate to that kind of situation...

### Program Logistics: Evaluation and Effort

The most common metrics used to evaluate Extension Forestry peer-learning

programs were participant evaluations of presentation quality (36 programs), changes in land management practices reported by participants (30), number of new participants or graduates annually (31), number and type of volunteer contributions including volunteer hours (23), organizational leadership positions filled by participants (15), and articles written by participants (10). Other metrics included self-reported dollars saved or earned, contacts with natural resource professionals, and land management plans completed and implemented. Evaluation data were collected via on-site workshop or other event evaluations by 34 programs. Other evaluation data collection strategies less commonly used included an annual or multiyear survey, input from an advisory or steering committee, online and mail-in reporting of volunteer contributions, and focus group discussions with participants.

Slightly more than half of the effort of managing peer-learning programs (reported as percentages allocated by participants) was dedicated to the initial training, followed by managing and corresponding with volunteers (18% of total effort), offering refresher or continuing education trainings (13%), and program evaluation and reporting (12%). Several program evaluation challenges were discussed in focus groups. Some estimated that volunteers reported only half of what they actually did. Several others did not track volunteer hours or attempt to evaluate peer learning specifically, with one PM stating that he wasn't sure how to evaluate peer-to-peer activity. A few had used online evaluation techniques with varying success.

While several PMs identified the challenge of managing and reporting the work of an ever-growing group of volunteers, in response to an open-ended survey question about future changes one northern PM lamented that the program's biggest failing was:

Our lack of follow-through with cooperators [volunteers]. We constantly strive to be in closer contact with our network. This is the most important change that we will make.

This same manager plans more events designed "to introduce co-operators to local conservation professionals... in the hopes that they can... work together in their region." Seeking ways to more efficiently connect volunteers with those seeking assistance, other PMs plan to "strengthen connections between volunteers and poten-



tial volunteer opportunities” and “to implement a mentoring program that would allow the general public direct contact to volunteers.”

Increased attention to program evaluation was a common theme among the program changes planned for the next 5 years. In open-ended survey responses, seven different PMs mentioned evaluation among their most important changes, including “developing stronger descriptions of outcomes for the program,” “putting more emphasis on volunteer output and less on training,” and “set[ting] broad, concrete goals for volunteer output and work[ing] to inspire action.” At least four others planned to improve and standardize program evaluation procedures, including “improv[ing] assessment and documentation of longer term (6 months) impacts.” For one program, this means a combination of “more rigorous volunteer hour reporting requirements” and establishing two new methods to streamline and simplify volunteer activity reporting.

## Discussion

Extension Forestry peer-learning programs are designed to directly influence participants’ own land management actions and indirectly influence others through the volunteers’ outreach to their peers. PMs tap into the landowner volunteer capacity to multiply their work. Volunteer work can increase landowner outreach and educational capacity dramatically (Snyder and Broderick 1992, Fletcher and Reed 1996). However, this second level of outcomes and impacts can be difficult to measure. The most common method to estimate impacts is through volunteer activity reports, but these reports primarily document volunteer outputs as volunteers do not always know what actions were ultimately taken by those whom they served.

Peer-learning programs may provide a medium for Extension to reach new or currently underserved audiences. The literature suggests that while most landowners are likely to harvest timber, timber production is not among their primary reasons for owning woodland (Jones et al. 1995, Butler 2008). MV programs are increasing the overall diversity of topics addressed in the programs; specifically, they are decreasing offerings of traditional management-related topics and increasing offerings of topics concerning forest health, wildlife, and other areas, such as global positioning systems (GPS) use, intergenerational land transfer,

and financial aspects of management. Landowners uninterested in harvesting or selling timber may be less likely to seek assistance from natural resource professionals; landowner education programs that leverage personal networks may be more likely to reach these landowners (Gootee et al. 2010). Furthermore, some Extension Forestry peer-learning programs, particularly OPL programs, specifically target historically underserved landowner populations, such as women, minority ethnic communities, and absentee owners, leveraging the personal networks of landowner leaders and volunteers. Programs that capitalize on landowner leadership by actively engaging landowners in the program development process, as seen with the Idaho Master Forest Owner program, align well with current understanding of effective approaches to adult learning (Knowles et al. 2005).

Many programs struggled with loss of funding and overall capacity. While some programs generated revenue through fees, these opportunities were viewed as limited. More often, programs relied on partners to provide funding support, as well as other forms of assistance. Increasing partnerships with existing and new organizations may provide an opportunity for increased future support.

In addition to assistance with reaching new or underserved audiences, increased use of digital communication tools may streamline and improve communications with participants. These tools were viewed as particularly valuable for volunteer activity reporting and maintaining communications with active program participants rather than during initial trainings. However, it seemed desirable that the use of digital technology in outreach dovetail with and supplement other educational formats, not substitute for them. Focus group participants felt that face-to-face interaction and field-based learning were highly effective learning formats that cannot easily be replicated online.

As researchers advance in their ability to more finely segment landowners through the development of landowner typologies (Emtage et al. 2007), peer-learning programs may be well positioned to target specific audiences in collaboration with trained peer volunteers from those communities. They may also contribute to creation of knowledge networks due to their diversity of partners and their ability to foster peer relationships. These relationships seem to lead to valuable outcomes. Surveying landowners

who had been visited by a trained New York Master Forest Owner Volunteer, Allred et al. (2011) found landowners planned to develop goals and objectives for their properties, obtain assistance from a natural resource professional, and consider thinnings or other land management treatments. All of these activities are generally viewed as consistent with sustainable private forest management. Thus, peer-learning programs may provide the opportunity to efficiently distribute Extension information and foster active, landowner-driven learning to a large community.

Given the central role that trained volunteers play in MV programs and the number of MV PMs who report volunteer reporting as a challenge, this is an area in which further applied research may be justified. Some PMs report success using digital communications to maintain relationships and communication channels with volunteers. While Extension Forestry programs have made some progress adopting digital communications, focus on these tools specifically in the volunteer maintenance and evaluation stages may be warranted. If deployed in a manner that is accessible and appealing to volunteers, digital communications may streamline the volunteer communications, evaluation, and reporting components of MV program management, which collectively account for almost one-third of PMs’ effort. Such efficiencies may be especially important to evaluation efforts as the data indicated an overall decline in face-to-face offerings, the medium through which most PMs collected evaluation information. Regardless of the techniques used, PMs consistently stated a need to streamline and improve volunteer communications and reporting.

The goal of this study was to inventory and synthesize Extension Forestry peer learning-based landowner programming efforts as part of a larger study that aimed to assess the current state of Extension Forestry’s landowner education efforts nationwide. As such, the study looked only at Extension Forestry programs; similar programs may exist within other sectors. While these programs were outside the scope of this study, exploration of landowner peer learning in other sectors may be a worthwhile topic of future research. Similarly, evaluating the outcomes of individual programs was not within the feasible limits of this study. However, the results of this synthesis provide the groundwork for a more detailed



inventory or for localized case studies of individual program effectiveness in the future.

## Conclusions

At least 39 peer-learning programs targeting private forest owners multiply the value of the public investment in Extension Forestry faculty and staff by leveraging small annual budgets to support the work of volunteers, many of whom remain active for years. Peer learning PMs have traditionally sought external funds to keep their programs operational. Dependence on a small number of funding sources, in particular FSP and RREA, poses a challenge to the future stability of these programs, which serve as a foundation for the broad suite of public investments to support the conservation and management of the nation's privately owned forest resources. Because they operate through peers and personal networks, MV and OPL programs are well positioned to engage specific subgroups of the broad and diverse family forest owner population, a task facilitated by recent advances in landowner segmentation and typology development. However, many MV PMs expressed a need for more streamlined and effective volunteer communications and evaluation systems to effectively document and report the public value created by their programs; the rise in use of digital technologies may facilitate the process of addressing this need. In summary, these programs constitute a significant component of Extension Forestry's private landowner outreach effort and will likely continue to be an important tool for Extension in reaching this community, especially as the programs evolve to incorporate new technologies and to address the changing needs and interests of the landowner community.

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