

Forest Pest Outreach Volunteerism in Northern New England: Strategies, Motivations and Challenges

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Introduction and Background

Invasive forest pests have been identified as a major threat to the Northern New England eco-region. Of particular concern are Asian longhorn beetle (ALB) and the emerald ash borer (EAB). Together they pose an imminent threat not just to the health of these forests, but also to essential regional industries such as tourism, recreation, and forest products. EAB causes mortality to ash trees, while ALB targets many hardwood varieties including maple, willow, elm, and birch. As of 2013, EAB has been found in Michigan, Ohio, Indiana, Illinois, Maryland, Pennsylvania, West Virginia, Wisconsin, Missouri, Virginia, Minnesota, New York, Kentucky, Iowa, Tennessee, Connecticut, Kansas, Massachusetts, New Hampshire, North Carolina, Colorado, Ontario, Quebec, and ALB has been found in New York, New Jersey, Massachusetts, Ohio, and Illinois. Both insects are able to spread long distances with the help of humans, through the transport of firewood, nursery stock or wooden shipping materials.

Early detection of infestations is vital for the success of eradication and containment efforts by limiting the infested area, decreasing the number of trees removed and reducing management costs. Volunteers can play a major role in early detection of invasive forest pests. Forest Pest Outreach Survey Project (FPOSP) of Maine, the First Detector Program of Vermont and the New Hampshire Cooperative Extension Coverts and Master Gardener Programs are examples of early detection programs in Northern New England. These programs aim to educate and engage the community to prevent infestations of invasive tree-killing pests. However, the impact and efficacy of these outreach efforts have not yet been determined. Volunteer experiences, including motivation and perceived efficacy, may help us better understand what is working, and what needs to be changed so that such program participants may function as effective early detectors of invasive forest pests.

This project is designed to determine the motivations and factors behind continued volunteering support and efforts. Our objectives are to identify the problems facing the volunteers of the outreach programs as well as determining how to better equip them for future trainings and outreach through semi-structured interviews. This project has the capacity to enhance invasive forest pest detection and education efforts currently in place and those in the future.

Methods

Participants

This study was conducted through interviews with volunteers from the Forest Pest Outreach Survey Project (FPOSP) of Maine, the First Detectors Program of Vermont as well as the Coverts and Master Gardener programs through Cooperative Extension of New Hampshire. A number of volunteers had no formal affiliation to any of these programs, yet they were active in their community, offering forest pest outreach, initiatives and public education.

Procedure

FPOSP, First Detectors, and Cooperative Extension provided contact information for current and past volunteers who had participated in forest pest trainings or were involved in forest pest outreach. Research assistants contacted 191 volunteers from Maine, New Hampshire and Vermont. Sixty-five responded: 52 agreed to be interviewed, 10 declined, and three demonstrated interest, but lacked the time to participate. The volunteers were initially contacted by e-mail with follow-up phone calls or emails as needed. Interviews were conducted over the phone and recorded prior to transcription.

Most volunteers reported that they had been involved in forest pest outreach between one and three years. Several said that they had been active “*since the beginning.*” Most participants have been volunteering with other organizations for many years. The frequency of forest pest volunteer activities varied, both from volunteer to volunteer, and depending on the season. Many volunteers reported that they participated in formal forest pest activities several three or four times per year, while informal activities were more frequent. Several mentioned that volunteer events were much more common during the summer.

Questions

Interview questions focused around eight topics:

1. Initial motivation for joining forest pest campaigns
2. General perceptions about their role as volunteers
3. Overall volunteer experiences
4. Impressions of training experiences
5. Review of outreach materials
6. Barriers to outreach
7. Perceptions on their effectiveness in educating their local communities
8. Reasons for continued volunteerism

There were six sets of questions, totaling 52 questions in all. On average each phone interview lasted 30 minutes, with several taking as long as an hour. The recorded interview sessions were transcribed verbatim. Following the completion of the phone interviews, the transcriptions were reviewed and analyzed for any major themes, patterns and relationships using qualitative data analysis.

Results

Initial Motivation for joining Forest Pest Campaigns

We first wanted to understand why volunteers initially became active in the forest pest campaign. Interviewers asked participants, *“How did you first find out about the volunteer trainings for the Forest Pest Outreach Program (ME); Coverts, First Detector or Master Gardener program (NH); or the First Detector Program (VT)?”* and *“Why did you choose to get involved with invasive forest pests issues, as opposed to other volunteer opportunities?”*

Participants said that they volunteered because the issue is important to them. Some noted that importance of forestry economically, both for them personally or for the community as a whole: *“Because I live in...kind of the North Central part of the state where forestry is a big part of the economy ...and I have a big forest myself of 200 acres so I’m concerned with any kind of forest pest coming on to the horizon”* (NH).

Many participants mentioned their love for nature or trees as a reason why they are interested in forest pests:

“Well I enjoy the woods...” (VT).

“I’ve always been interested in forestry type things...back when I was a boy scout even...” (ME).

“I had this love affair with trees...my uncle was a forester, and another uncle did a lot of early planting of trees around and urban setting...to help purify the air...I used to go out and walk in the pines with him, etc. etc...kind of a family thing” (VT).

Others mentioned valuing and preserving a sense of place: *“I grew up here in this area, loving the pond and loving the river as a vacation area. We’re from southern New Hampshire so you know we have a lot of great memories and I love it and want to protect it...”* (NH).

Others were encouraged to participate after learning about the devastation caused by Asian longhorned beetles in Worcester, MA: “*..I lived in, up eastern Mass, and I saw what happened in Worcester...it was a sad situation, everybody in Massachusetts saw that, y’know, they had to cut down almost every tree...once I had seen that, I said’...you have to be informed, and try to keep an eye out..*” (ME).

For some, the outreach work is compatible with their professions: “*I’m a naturalist and I spend a lot of time in the woods in my profession in the forest*” (ME). Some were already involved in land trusts, conservation nonprofits or conservation commissions, and the training seemed like a logical addition: “*I was interest in stuff like that—being on the conservation commission and the tree warden in town and so forth and thought it was a good fit for my time*” (VT).

Some volunteers are educators or retired educators and were especially attracted to the educational portion of the program: “*I’m retired, and I’m also an educator, and I work with a lot of members of the public who are landowners, or interested citizens, or members of conservation commission, and it allows me a forum to talk to these people and tell them what’s going on with nonnative pests*” (NH).

Implications for volunteer programs:

- Ensure that volunteers understand the implications of invasive forest pests.
- Target as potential volunteers those whose work places them both in the outdoors and in contact with people.
- Target former educators as potential volunteers.

General Perceptions about their Role as Volunteers

Volunteers' perception of their role as volunteers influences their actions and outreach efforts. In order to learn more about perceived roles, interviewers asked, "*What do you see as your role as an outreach volunteer?*"

Most participants thought that their role as volunteers was to educate, "*be a resource expert*" (VT) or "*provide information*" (VT) to their community about invasive forest pests. One volunteer described the role as "*being a local resource for my community, being a go-between between my friends and my community and the experts at UNH and somebody that's trained to some extent to be on the lookout for pests themselves*" (NH). Another said, "*To spread the word and provide resources to people who also are interested in volunteering*" (ME).

Several volunteers mentioned that it was their job to help paid professionals: "*I guess to lessen the burden on our professional—paid professionals that are in the field because they have—or at least I feel they have way more work than they can handle. There are too few of them really*" (VT).

Others said that it was their role to ensure that the community was prepared for the arrival of invasive forest pests:

Well my role...is currently to get Montpelier prepared for the arrival of the emerald ash borer which I think is, unfortunately, an inevitability based on the fact that we're surround by states that have the emerald ash borer. So my current role right now is to...do the preparedness plan for Montpelier. At the same time, respond to any sorts of reports of either ash tree damage of some sort or –I just had a report yesterday of a fellow that caught a beetle that was convinced it was an emerald ash borer and so I went to meet with him and collected his beetle and fortunately it's not! (VT).

Implications for volunteer programs:

- Volunteers consistently identified roles where they were “needed” or helping. Be sure to communicate how helpful volunteers are to your program so that they can feel fulfilled by their role.
- There is some variation in volunteers’ perception of their roles. Confirm that volunteers’ perception of roles and goals aligns with the goals of the program.

Overall Volunteer Experiences

A number of questions allowed the participants to describe their volunteer experiences.

Questions included:

- *Please tell us what you’ve learned about doing invasive forest pest outreach. What works best from your experience?*
- *What doesn’t work well in your experience?*
- *What outreach activities have you done since receiving your training?*
- *Could you please describe your first outreach experience?*
- *Could you please describe your most recent outreach experience?*
- *Who have you been targeting as your audience in outreach efforts?*
- *What are the keys to effectively reaching this particular audience?*
- *What are the best opportunities for getting outreach about invasive forest pests into the right hands?*

Overall, participants are positive about their volunteer experiences. They consider the work to be important and like sharing information with people. One volunteer said:

I'm happy with the overall experience of helping people. I always did like to help teach people. Kind of like what I do or my job in a sense, so I educate people. Um, so I guess I like that aspect of it, I love to learn about things--even though they're not always nice things to learn about (NH).

Specifically, volunteers' experiences vary. For example, some volunteers give formal presentations, while others prefer informal conversations. Some target children and others adults. Some incorporate information into their professional work as foresters or camp managers.

The programs vary across the three states. Volunteers in Maine and Vermont are more likely to focus on forest pests specifically, while volunteers in New Hampshire may have other primary interests, Master Gardeners, for example, and attend the forest pest training as an additional topic. Several volunteers were unaware that they were part of a forest pest program. Instead, forest pest outreach was part of their Master Gardener or broader conservation or invasive plant work.

Volunteers are happy with the support they receive from state agencies. They receive materials that they need and find the trainings to be helpful and informative. One Vermont volunteer said:

I can't praise these folks enough here...there's lots of support for us from UVM Extension and from forest parks and recreation which is a sister department for the one I work for. So we have a lot of support for these people, and like I say they're organizing these field trips and providing us with the outreach materials and I'll need to hit them up for some more outreach materials because I've run out of some, but no I can't say enough how well these folks in Vermont have been supporting our efforts and continuing to provide education because this is – we're still learning about this... (VT).

Volunteers generally targeted fairly broad populations including “landowners” (NH) “people who garden”(ME), “whoever I can” (NH), “Natural history groups and people that work outside...of course town residents” (NH), and “vacationers”(VT). Several specifically mentioned working with children, while others preferred working only with adults.

Volunteers organize and participate in a wide range of outreach activities. Some described working at fairs, parades, festivals, farmers' markets, flower shows: *"I do the Fryeburg Fair, I set up a booth at the fair every year where thousands of people go through and a third of my booth is about the beetles and the beetle displays and all that"* (ME).

Children are another common focus. Some volunteers visit schools, while others work with scout troops or camps:

With twenty kids I just broke them up into 2 groups and they were like I said 1st through 5th grade and they were great. Those kids were great. They were really interested in that and they loved the tattoos and pencils and 'you see this beetle, you call the number on your pencil!' So they went home with their beetle tattoos and pencils today (ME).

Volunteers frequently share information with town officials and committees including select boards, tree boards, and conservation commissions. Some work to help create local preparedness plans: *"I will be meeting with the select board next – a week from today – our local select board – to talk to them about creating a town plan for when we get EAB"* (VT).

Some volunteers noted that people with an interest in the environment and the natural world are receptive audiences. This includes garden clubs, land trusts and other environmental organizations: *"I've done talks for different landowner groups, mainly – not so much town oriented, but groups that are already sort of have an interest in the environment or in trees or in learning more about it"*(VT). One volunteer noted that these people are especially important to target because they are in the field and have a capacity to further share the information:

I think it's important to target people that have the capability to deliver the message. And, those would be people that are naturalists, and...many of them go to various meetings...that do interpretation work...there's the group of foresters and natural resource managers and wetland scientists, and they all have their professional organizations. All of these conservation commissions that are out there, and also um, the, high school teachers (NH).

Several volunteers stressed that their targeted audience was “*anyone who would listen*” because anyone could notice a suspicious insect. In addition to events and talks, volunteers mentioned posting information in public places and having informal conversations with their friends and neighbors.

People are generally happy with the scope of their outreach, though several volunteers mentioned that they wish you could do more: “*I, definitely on the pleased side for sure, helping people and learning things. On the negative side...I wish I could volunteer more...*” (NH).

Implications for volunteer programs:

- Flexibility is valued. Volunteers like that they can work with audiences or in settings that they feel comfortable.
- Volunteers find the educational aspect of their work to be especially valuable.
- A strong responsive contact person, such as a volunteer coordinator, is valued.

Impressions of Training Experiences

Volunteers were also asked to review their training:

- *What were the most memorable things from your invasive forest pest training? The trainings have been carried out differently across New England. Could you describe what your training was like and what it covered?*
- *What did you not understand during the volunteer training?*
- *What content would you like added to future trainings?*
- *Specifically concerning EAB and ALB, what questions would you want addressed in future trainings?*

Volunteers were generally very positive about the training they received. They found the presenters to be knowledgeable and energetic. Several volunteers mentioned the costumes, which received mixed reviews. Some volunteers enjoyed the costumes while others thought that they were not appropriate for adults:

I almost feel there should be a more concise delivery and...a delivery mechanism for more professional groups. I think that the costumes and the pencils and the Frisbees and the tattoos and, yea and, the delivery style...the presenters is absolutely spot on for a seventh grade science class but maybe not particularly respectful for...professional time, so probably having a one to two hour long presentation rather than just the full load would be pretty helpful (ME).

Pictures and stories of devastation caused by the insects were especially memorable for volunteers. Some trainings even included a field trips to see the effects:

We've taken a field trip to Worcester, Mass, for instance to look at the firsthand Asian long-horned beetle damage and the tree removals basically there and how sorry that is. And also we just took a trip to outside of Albany to look at an infestation of the emerald ash borer. So that kind of hands-on, seeing firsthand the communities that have been affected is very, very useful and really – it really invigorates the individual here to step up and communicate the threat even more (VT).

Hands-on activities were very popular. These include seeing models of the insects, examples of the galleries and damage, and various field experiences. Some trainings included mock infestations for participants to practice identifying, and others included capturing cercesis wasps:

I certainly loved...capturing the...cercesis wasp, I thought that was very good and I think just getting out in the field and doing identification work ...going to where the pest has been so you can see...how to identify it more readily and what the damage might be (VT).

Several volunteers suggested adding more hands-on or field elements to the training or making sure that there:

I think...I shouldn't say more hands on, but just the ability to go out in the field a little more with the instructor, and look at types of damage instead of ...pictures on ...PowerPoint or something...but actually being in the field and looking at the tree that's infected would be really good (NH).

Other suggestions for improvements to the training included more information about how to get the word out, especially working with other audiences, e.g. those not online or school age children:

I guess more on how to get the word out because I still talk to people every day out here who don't know what they are who have no idea what they are and I'm not sure... I try to do a good job of getting the word out, but apparently it needs to get out in different venues. I don't know if it's getting more stories in the newspaper or what um but there seems to be some gaps in where the outreach is (NH).

Another volunteer noted:

I think what I mention about reach the people that are not online. It is a significant number. It may not be where you are um and it isn't in parts of New Hampshire like in the south and the southeast but it is in the central and north and I think uh how to reach those people would be on the top of my list (NH).

Implications for volunteer programs:

- Costumes are not for everyone.
- Pictures and stories of devastation are memorable and effective.
- Hands-activities and field trips are memorable and effective.
- Provide volunteers with additional information about how to reach different populations and creative outreach strategies.

Review of Outreach Materials

The volunteers have a unique perspective about outreach materials; there for a series of questions asked volunteers to asses outreach materials:

- *Which materials have you been using in your outreach?*
- *Which one is most effective? Why? Which one is least effective? Why?*
- *What revisions would you make to the current materials?*
- *What additional materials are needed?*

- *What is your current level of use of social media or other online sources as part of your outreach?*

Volunteers frequently mentioned the credit card sized cards with pictures and information about the insect, including the exit hole. Many volunteers considered these cards to be the most effective outreach material. They are small, concise, and include pictures and a convenient size:

...There are wallet cards for each of the..three species and that's really great, they all have the information about the species, they all have the identifying characteristics of that species and they all have the phone number ... the Asian Longhorn Beetle one has the hole so you can check the size of your hole versus the actual Asian Longhorn Beetle hole so those are really good. And they're all colorful, that probably makes a difference (ME).

One volunteer noted that the cards can help start conversations:

I think that the little cards are practical because I carry the little cards ... with my keys of my car...when people see my car keys, they say, "what are those cards that are you carrying behind? Are they pictures of your kids?" And I say" well, no, not exactly, but they have pictures!" (VT).

Other volunteers question whether people look at the cards again after they pick them up:

"People don't seem to want to hang onto them. They don't really want anymore – they don't want it because people are into recycling and doing those kinds of things and so they're not that interested in it" (ME).

Volunteers noted that the tattoos and pencils are great for kids, and can help generate conversation with their parents: *"Giving them pencils...we had pipe cleaner insects that worked really well – I'm not sure who developed those, but that was great when we did that for the kids. And that helps to educate the adults of course, getting the kids involved" (ME).* The tattoos are especially popular: *"What else is effective? The tattoos I gave them out actually at Halloween and they were scary and kind of appropriate at the time so that was popular (ME).* However,

these items do not convey many details. The bumper stickers are the least popular: *“People don’t want the bumper stickers though. They don’t want to put them on their car”* (ME).

Volunteers had mixed reviews of different fliers or brochures. These materials can be an efficient way to present the problem, but can also present more information than people want to read: *“I think for a lot of people that’s just too much information... at the same time I think those are the most effective, it’s just one thing to, to pick up and you have information on all three”* (ME). Volunteers feel that the most effective materials have more pictures than words: *“less is more. If they want to find out more they’ll get on the web and you can direct them to that and then they’re research it, but if you can do just real simple key points I think it’s more effective”* (VT). According to the volunteers, effective pictures include those of the insects, look-alikes, or damage: *“The brochures are excellent, especially the ones with the pictures of the entrance and exit holes, the types of damage, the thinning at the crowns, anything where there’s a picture is really useful”*(ME). Similarly, volunteers value models and physical specimens:

The rikor mounts are golden because you can show somebody here it is, you know, and people are always thrilled... I mean pieces of wood.... That piece of wood that you show everybody that the Asian Longhorn Beetle got a hold of? it’s worth a million words. I mean that was what got me hooked in the first place two years ago...you know, I just looked at that, and I said oh my god, I read about it, but that? ... you know you show that to people and they say “oh now I get it” (VT).

Implications for volunteer programs:

- Credit card size cards seem to work well.
- Tattoos and pencils are good for kids, and to start conversations.
- Material should include more pictures than text.
- Photos of look-alikes are useful.
- People enjoy models or pieces of wood that they can touch.

- Bumper stickers are not popular.

Barriers to Outreach

To learn what obstacles volunteers might face, we asked, “*What are the barriers to getting outreach about invasive forest pests into the right hands? Are you receiving adequate and continued support from the Forest Pest Outreach Survey project; Coverts, First Detector or Master Gardener program (NH); or the First Detector Program during your current outreach sessions? Why or why not?*”

Many volunteers mentioned time as a barrier, both for themselves and for those receiving the message. Several volunteers mentioned that teachers did not feel that they had time to include such information because of curriculum limitations. Some felt that they could be more effective if there were more volunteers to help spread the work load:

You know if I was retired I would have a lot more time. I think time is a barrier. We’re doing a lot, we’re doing – you know, there’s a lot on your plate in terms of the whole shooting match – the preparedness plan, and I’m also doing some tree survey work in the park – we have a large urban park right in the middle of town that I’m finding has a lot of ash trees for instance. So there’s some survey work that’s going on but so you’re getting pulled in a lot of directions. I think the key would be to have more volunteers spending some time on it. And right now in our community we have the two first detectors, and I know that they’ve been giving the course out and expanding that number of first detectors. I think there’s a lot of people like me out there that if they became aware of the ability to become a first detector and to take – to volunteer with the tree board I think they would step up and so I think the key is probably getting more first detectors out there in all of the communities so that they can be working on various aspects of the communication and so it’s more hands make for less work kind of thing (VT).

A lack of interest was also identified as a barrier. Respondents said that people may not view forest pests as an issue that will affect them personally: “... *A lot of it depends I think on the community you live in...I would think that just trying to talk to an audience that’s from Concord or Manchester would be an issue just because ...they have no skin in the game – they’re not*

potentially affected by it other than to lose an ornamental tree” (NH). Others are challenged by the technical knowledge required:

I think one of the barriers are that there seem to be quite a few now that we are – there’s four or five or six bugs – insects out there that seem to be coming down the line and it’s kind of like an overload with people. They don’t know bugs anyway, they aren’t interested in bugs, they think bugs are icky so it’s hard for them to focus in on five that they really need to distinguish between and figure out which they have – and you know, look out for them (ME).

Logistics could also be a barrier. This includes scheduling challenges and making sure that they have materials to give to interested people: *“I guess barriers would be...having the right information you know that you can hand people. You know like the little cards for Asian longhorned beetle were really helpful” (NH).*

Implications for volunteer programs:

- Continue to recruit volunteers to share the work.
- Ensure that trainings include methods for efficiently spreading information.
- Avoid jargon in outreach activities and materials.

Perceptions on their Effectiveness in Educating their Local Communities

Interviews included several questions about the efficacy outreach activities: *Do you feel as though you’ve had an impact through your outreach efforts? How? Do you have any examples or stories you can share? What might help create a greater impact?* Gaging their effectiveness was difficult for some volunteers because they cannot see direct impact between their actions and specific outcomes. Some volunteers said that they didn’t feel like their efforts would truly make a difference until an infestation occurs:

The outreach activities don’t really have an impact until there’s a problem. It’s hard to get people interested in something that may or may not occur at some point in the future. You know they tend to just say oh gee that’s fine uh and when it’s happened or when it’s

here then we'll do something about it you know preemptive um education is very difficult so I think the best thing to do is continually talking with civic groups uh essentially and just to give them an idea so they're cognizant of what the problem might be and just that so they have it in the back of their minds but they're not going to go into any great depth I don't believe as to what to look for or what's the problem or whatever they just want to – gee emerald ash borer yea it exists is could kill all the ash trees, okay, next? That's all they need is something just so that it's in their mind that there's a problem and who to go for once it occurs (VT).

Some participants noted that the message about not moving firewood resonated with some people:

Last year there was actually a friend of mine from another lake...called and said "my neighbor just came up from Massachusetts with a bunch of firewood and I don't know what to do, that's why I'm calling". And, so we were able to get someone from the state to come down and get it. I went down and looked at it, peeled off the bark and, um, looked at the channels underneath and didn't find anything that was strongly indicative of you know of an infestation but at the same time there were some that were a little suspicious so ah, a fellow came down and took all the wood. My understanding was that they were going to incubate some of it to see what hatched out, but I, I found out later that it all was incinerated so um, we don't know for certain, we just, suspect, where it came from an infested area in Massachusetts...(ME).

Others were more certain that their actions were reaching people. Several mentioned that people call them with suspicious insects: *"I had one woman call in and say, she said, 'I think I found one,' and so I gave her all the details and who she should contact and how she should do it, you know, package it up and send it off" (VT).* Others felt that they were making an impact just by raising awareness.

Implications for volunteer programs:

- Share success stories among volunteers in the state or regionally.
- Success can be defined in different ways, not just early detection of a forest pest.

Reasons for Continued Volunteerism

Participants overwhelmingly said that they would continue to volunteer with the forest pest programs when asked, “*Will you continue to volunteer doing invasive forest pest outreach? Why or why not?*” Most volunteers felt that the work was important. One volunteer said, “*Because I think it’s probably a good program...it’s a kind of a worthwhile goal*” (VT).

Others commented about the environmental consequences:

I think it’s important to protect the native species that we have here ...the other thing that we’re not, that I’m not sure about...is what the impact global warming is gonna be for especially like some of the New England states. The impact it will have on the maple syrup production ...especially...if you’re looking at New York, Vermont, New Hampshire and Maine.... I think it’s something that we need to ah, you know, actively be involved with (NH).

Another summed up his/her reasons thus:

I love the forest and just on the most basic level and the thought of having all...having New England forest, forests in general decimated by these insects makes me wanna cry... and number two I feel like I’m, we, we’re doing something very positive for the community...And on the other level too, personal satisfaction, I’m really learning a lot (VT).

Participants were also asked what could help encourage or retain volunteers. Many mentioned that continued contact, though email, newsletters, regional meetings etc. helped them feel like they were not tackling a problem alone:

Making them feel engaged um...whether that’s just a monthly or quarterly email or newsletter check-in-- this is what’s going on...here’s an opportunity, it doesn’t have to be in the state they’re in ...maybe somewhere in New England they can go to this training session if they want. I think just the fact...everybody likes to be included and when you feel as if you’re part of a team or club you ...become more productive for that team and club... if you feel like that’s something I did once and they’ve never called or sent me anything since ..is it a waste of time or is it something I’m really committed to. I think if there’s a way to keep people engaged that would be the best thing (ME).

The newsletters and updates can also reassure that the volunteers’ efforts are making a difference: “*She [volunteer coordinator]sends us news that says hey, you know, such and such a*

state has been successful in stopping this or you know, know that there is that possibility if people really pull together and do something it can have that positive effect.”

Recognition was also reported as a good source of encouragement:

I think people need to be rewarded in whatever fashion. Verbally is good-- you know tell people they're doing a really good job, telling people what they're doing is making a difference and that has to continue because if it.. and I think it is happening, but I think that's really critical to sustaining this. We may get tired of this and it may be 10 or 15 years before this thing shows up and then you know we are going to lose interest (ME).

Several volunteers mentioned that they thought it was important that the use of their time was acknowledged: “*You know, people that do this on their own time should be recognized for doing that. And sometimes essentially a pat on the back is all it takes*” (VT).

Implications for volunteer programs:

- Continue to stress the importance of forest pest issues.
- Continue to thank and recognize volunteers for their efforts.

Discussion

Volunteers are mostly positive about their experiences, think the forest pest awareness is important, and enjoy outreach activities. Many volunteers are motivated by their love of the natural world and New England. Some volunteers noted that they were moved by Worcester’s experience with Asian longhorn beetle.

There is variation in the forest pest outreach activities. The volunteers use different strategies and focus on different populations. For some volunteers, forest pests are the focus of their volunteer outreach efforts, while others included forest pest material with other outreach activities. Some volunteers focus their efforts on town officials, others focus on children, and

others will talk to anyone who will listen at public events. The variation in strategies helps ensure that many different people are exposed to the forest pest information.

Most of the volunteers noted that people respond well to short concise materials. Volunteers noted that handouts with large blocks of text and few pictures do not seem to be effective in conveying the message. Photographs are important, both of the potential damage and the insects themselves. Photos of the insects' "look-alikes" are also helpful.

Hands on activities are important both in training and in outreach. People seem to respond well to models and demonstrations. Volunteers were generally very positive toward any field trips or field experiences, and other mentioned that there should be more field aspects to the trainings.

While some volunteers described people calling them with suspicious insects, others were concerned that people will not truly care about forest pests until there is an infestation in their own back yard. Some volunteers noted that it is difficult to know if their outreach activities make a difference.

Many volunteers said that time is a major barrier to their volunteer efforts. Some felt that they could be more effective if they had more time to give to the program. Some noted that community members are too busy to truly take in their message.

Recognition and sustained contact remain important in sustaining volunteers' commitments. Volunteers appreciate periodic meetings, trainings and contact. Other volunteers said that it is important the volunteer experience is low pressure and flexible. Most volunteers planned to continue to volunteer with the program in future. Volunteers were uncertain about how to recruit additional volunteers. Some suggested that outdoor-minded people should be targeted.

Conclusion

The forest pest outreach programs present an important opportunity to spread awareness about Asian longhorned beetle and encourage early detection. Most of the volunteers are committed to and enjoy the program. These volunteers are able to reach a diverse audience through their efforts. Attention should be paid to ensure that outreach materials have high quality photographs and concise language. Ongoing trainings, field trips, support and recognition are vital in maintaining the programs. Trainings including hands on or field components could be especially helpful. Other topics could include current status updates and outreach techniques. Sharing individual outreach experiences or successes could help volunteers feel more effective. Outreach leaders in Maine, New Hampshire and Vermont should share their successes so that those in other states can learn from these experiences.

Appendix 1: Interview Script

Prompt:

Hello [Participant Name]!

Thanks again for agreeing to participate in this interview. As mentioned in the consent form I sent you, this interview will be recorded.

Do you have any questions before we start?

Okay, well I have about six sets of questions to ask you; they are fairly formal and I must ask all of them. If you are unsure of how to answer any of them feel free to say so and we can move on to the next question. We can return back to any previously asked question if you think of anything else you would like to add later on during the interview.

Some questions may overlap, but I will still ask them.

All question are voluntary and in order to go through them all I may need to redirect you during the course of the interview.

Does that sound okay?

Are you ready? Let's get started then!

Getting Started with Volunteering

We would like to start by asking how and why you got involved with doing invasive forest pest outreach activities.

How did you first find out about the volunteer trainings for the Forest Pest Outreach Program (ME); Coverts, First Detector or Master Gardener program (NH); or the First Detector Program (VT)?

Why did you choose to get involved with invasive forest pests issues, as opposed to other volunteer opportunities?

What did you know about invasive forest pests before attending the volunteer training?
Probe: EAB/ALB specifically?

What do you see as your role as an outreach volunteer?

Evaluation of Volunteer Training - Content

I would now like to discuss the actual Forest Pest Outreach Survey Project training session.

What were the most memorable things from your invasive forest pest training?

Probe: The trainings have been carried out differently across New England.

Could you describe what your training was like and what it covered?

What did you not understand during the volunteer training?

What content would you like added to future trainings?

Probe: Specifically concerning EAB and ALB, what questions would you want addressed in future trainings?

Evaluation of Volunteer Training – Delivery

Now we would like to talk about your invasive forest pests outreach activities.

Please tell us what you've learned about doing invasive forest pest outreach. What works best from your experience?

Probes: What doesn't work well in your experience?

What outreach activities have you done since receiving your training?

Could you please describe your first outreach experience?

Could you please describe your most recent outreach experience?

Who have you been targeting as your audience in outreach efforts?

What are the keys to effectively reaching this particular audience?

What are the best opportunities for getting outreach about invasive forest pests into the right hands?

What are the barriers to getting outreach about invasive forest pests into the right hands?

Probes: Are you receiving adequate and continued support from the Forest Pest Outreach Survey project; Coverts, First Detector or Master Gardener program (NH); or the First Detector Program during your current outreach sessions? Why or why not?

What sort of education on how to do outreach delivery would you like added to future trainings?

Outreach Materials Evaluation

We are curious about the materials that the Forest Pest Outreach Survey Project (ME); Coverts, First Detector or Master Gardener program (NH); or the First Detector Program (VT) has created such as brochures, posters, bumper stickers, etc. that help you during your outreach activities.

Which materials have you been using in your outreach?

Which one is most effective?

Probe: Why?

Which one is least effective?

Probe: Why?

What revisions would you make to the current materials?

What additional materials are needed?

What is your current level of use of social media or other online sources as part of your outreach?

The Future

Next, we'd like to find out your future plans related to invasive forest pest outreach.

Do you feel as though you've had an impact through your outreach efforts?

Probe: How? Do you have any examples or stories you can share? What might help create a greater impact?

Will you continue to volunteer doing invasive forest pest outreach?

Probe: Why or why not?

What would help retain and encourage current volunteers?

Probe: What would help recruit/gain more volunteers?

How has the recent discovery of EAB in New Hampshire affected you?

Probe: Your approach to outreach? Commitment to volunteering?

Would you like to add anything else about your overall experiences as an invasive forest pest volunteer – things you are pleased with or dissatisfied with?

Participant Profile

In our final set of questions, we'd like to gather some information about your background as a volunteer.

What is your educational background?

What is your current career? If you are now retired what was your occupational background?

Probe: If retired, how long have you been retired?

What other general volunteering opportunities have you been involved in?

Probes: Are you participating in any of those currently?

How long have you been volunteering for the activities you previously mentioned?

How long have you been volunteering with forest pest outreach?

How often do you conduct outreach activities?

Probe: Number/type of activities per year?

Appendix 2: Literature Review Prepared by Tynesha Dias

Identifying Motivations Behind Environmental Volunteerism and Sustained Volunteering Commitment in Regard to Exotic Forest Pest Outreach

Tynesha Dias, Dr. Jessica Leahy Dr. Crista Straub, Nora Bird, Sabrina Vivian & Margaret Snell

Literature Review

Motivations For Environmental Volunteerism

The environmental movement would not exist without the help of thousands of dedicated volunteers. Both public and private environmental organizations rely on unpaid volunteers to further the cause of protecting and helping the imperiled natural environment. (Ryan et al., 2001, p. 629)

The use of volunteers in environmental stewardship programmes greatly benefits the natural environment; however, little is known about volunteer's motivations for continued participation in the programs (Ryan et. al, 629). Motivations behind environmental volunteerism have only recently begun to be extensively researched since volunteerism is increasing due to many factors in the US during the past decade. (Bruyere & Rappe 2006). Limited budgets of public land management agencies (e.g. USDA Forest Service, Bureau of Land Management) together with an increased use of their resources by visitors have helped to create a rising dependence on volunteers (Bruyere & Rappe 503; 2006). Much of the research concerning environmental volunteerism has previously been dependent upon the significant research on motivations of volunteers in community based volunteer programs, yet the motivations behind the 'altruism' of

environmental volunteers varies greatly from those of community based volunteering. According to Bramston et. al. (2011) the motives of volunteers involved specifically in environmental projects are thought to differ somewhat from general volunteers in that the product of their labors is usually so visible and involves learning (p.777). There are generally four broad categories of motivation related to any volunteering context, yet there are six core focuses for motivations in environmental volunteerism (Measham & Barnett 2008, p.540). Measham and Barnett's (2008) proposed set of factors motivating volunteers in an environmental context are: contributing to the community; social interact; personal development; learning about the environment; a general ethic of care for the environment; and an attachment to a particular place (p. 540). Of these motivations 'learning', 'helping the environment' and 'social networks' have been the most prominent for environmental volunteers in their involvement in environmental action (G. Liarakou et al. 660) than any of the other factors listed. Understanding the motivations behind volunteer engagement in environmental programs is critical for meeting the needs of the volunteers so as to not only maintain a consistent volunteer base, but also to successfully meet the goals of the environmental program.

Role of Education in Environmental Volunteerism

Environmental education can—must—lead from awareness to action. That message should be reflected in program design and implementation, as well as in the ways environmental education is defined and valued," (Hudson 2001, p. 287).

Another factor to consider in conjunction with the principal motivations of engaging in environmental volunteers are the five principal modes of environmental volunteerism as

proposed by Measham and Barnett (2008). The five principal modes of environmental volunteer activity are: activism, education, monitoring, restoration and (promoting) sustainable living (Measham & Barnett 2008, p. 541). Measham and Barnett (2008) found that educating others about the environment was the most common mode of environmental volunteering despite personal development and (self-) learning about the environment were present, but not widely applicable. They found that learning for oneself, as a motivation is relatively rare, yet seeking to educate others is relatively common, which suggests a need for further research into the specific role of education in environmental volunteering (Measham & Barnett; 2008). In contrast to Measham and Barnett (2008), education for both the personal and public benefit may prove to be one of the most important self-sustaining factors perpetuating the continuance of environmental volunteerism, especially in relation to the modes of the environmental volunteering activities. Many, if not most join environmental volunteering positions such as stream monitoring programs, master naturalist and master gardener extension programs, conservation and preservation initiatives in order to further their own educational pursuits or to benefit the education of others such as during community engagement. Gaining educational experience also proved to be an important motivation for participation in volunteer activities (Ryan et. al., 630). Environmental education, a vital component of efforts to solve environmental problems, must stay relevant to the needs and interests of the community and yet constantly adapt to the rapidly changing social and technological landscape,” (Hudson 2001, p.283).

Sustaining Long-term Volunteerism & Factors that Contribute to Continued Participation

Altruistic factors that motivate volunteers to volunteer in the first place are not necessarily the reasons why volunteers continue to volunteer. It is important to nurture the volunteers long-term

by understanding their motives and recognizing that their motives can change with time. Furthermore, the reasons for the initial decision to volunteer may differ from those sustaining continued voluntary action (Penner 2004; Measham & Barnett 2008). Volunteers may initially join for altruistic reasons, but with ongoing participation, other benefits such as social interaction, becoming more attached to an area, and increased knowledge may become more important (Ryan, Kaplan, and Grese 2001; Lee and Hancock 2011). According to the functional theory of volunteer motivation (Clary et al., 1998), involvement in volunteer work is a function of the joint effects of individuals' motives for volunteering and the opportunities provided in the volunteer work environment to meet their needs (L. D. Allison et al. 2002, p.252). Although most research out there aims to identify the volunteer motivations that lead to long-term volunteerism, such a correlation cannot be made directly since factors leading to long-term volunteerism are heavily influenced by the volunteer organization itself. Volunteers' perceptions of program efficacy are an important factor that has been shown to contribute to ongoing commitment (Montada et al. 2007; Akin et. al. 2013). Another important contributor to long-term involvement is the need for volunteers to see that their efforts accomplish something tangible and positive (Donald 1997; Miles, Sullivan, and Kuo 2000). Volunteers are not "free labor, but individuals who will keep coming if their needs are fulfilled" (Ryan, Kaplan, and Grese 2001; Lee and Hancock 2011). Maintaining or improving this perception with ongoing training and skills development opportunities and regularly acknowledging volunteers' contributions should be priorities of program administrators if they want to retain and motivate their experienced volunteers (Akin et. al., 2013). If an organization desires to have a high retention rate of volunteers then they must accommodate their individual needs; the first step in

doing so is identifying these needs, suggesting that further research needs to be done in this sector.

Barriers to Commitment

As long as you contribute to the long-standing and changing needs of your motivated and willing volunteer base, theoretically you can possibly sustain volunteer commitment for years to come. Unfortunately, motivations and willingness to help may change over time, due to logistical barriers. In a study of volunteers in an environmental stewardship group, Donald (1997) found time commitments related to work, family or personal matters, and involvement in other volunteer activities were significant constraints to becoming more active volunteers,” (Lee and Hancock 2011, 26). Secondly, given the many demands on people’s time, if a programme is disorganized, participants may feel that their time is being wasted (Ryan et. Al, 646) suggesting that the organization and ill success of a volunteer program can in itself become a barrier.

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