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Cover Page Footnote

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The Need for a Chainsaw Safety Training Program for Female Forest Landowners

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Abstract. Female forest landowners (FFLO) are increasing in numbers but have been marginalized in technical training programs in the past. We conducted chainsaw safety training programs geared towards FFLO and compared program evaluation results with results from male-dominated chainsaw training workshops. FFLO are limited in their technical knowledge at the beginning of a workshop, are more likely to own different types of chainsaws than male participants, and generally liked having a women-only workshop. The takeaway is that FFLO thrive in a women-only environment and that more women-focused extension training programs are needed to provide with a safe and inclusive learning environment.

Nearly a quarter of the primary decision-makers for family forest land in the United States are women, and a further increase in female forest landowners can be expected (Butler et al., 2016, 2021). However, the forestry profession and forest management activities have historically been male-dominated, with limited involvement of and knowledge transfer to women (Lidestav & Ekström, 2000; Redmore & Tynon, 2011).

The lack of involvement by women in forestry/forest management activities is less understood than other gendered-related research, such as women in outdoor recreation (Lidestav & Ekström, 2000; Redmore & Tynon, 2011). However, drawing on other gendered research exploring outdoor recreation and extending it to female forest landowners, it has been shown that women are less likely to participate in outdoor activities in general. Women may feel unwelcome, awkward, inferior, intimidated, ill prepared, or physically incapable of participating in outdoor activities (Auster, 2001; Bialeschki & Henderson, 1993; Culp, 1998; Evans et al., 2020; Humberstone, 2000; Little, 2002; McDermott, 2004; Samdahl, 2013; Sue, 2010). Further, women may experience microaggressions related to the gendered nature of some activities, such as forestry, and thus shy away from participating (Evans et al., 2020; Sue, 2010). However, these barriers may be further compounded by other factors, such as research that indicates that women in the southeastern United States are more sedentary, have a fear of being outdoors, and believe that they lack the time to participate in activities (Lee et al., 2001; Pearson, 2008; Wesely & Gaarder, 2004; Wilcox et al., 2000).

Barriers faced by women to participate in forestry/forest management activities may also explain women's lack of participation in education and Extension activities (Lidestav & Ekström, 2000). A survey by Huff (2017) supported barriers created with gendered roles in forestry/forest management activities and noted that female forest landowners often did not feel empowered to ask questions in male-dominated environments. To help overcome barriers faced by women, several women-focused educational programs, such as the Women Owning Woodlands network, exist to provide forestry education and networking opportunities to female forest landowners (Huff, 2017; Strong et al., 2013).

Women-focused workshops covering multiple aspects of forestry have been successful in the past and provided female forest landowners with a forum for peer learning and asking questions (Redmore & Tynon, 2010). Hands-on learning is also essential (Kolb, 1984), and teaching women skill sets that they can use on their forest land is crucial. Further, women may not be at higher risk for injury when they handle farm animals or materials, but they are at a much higher risk for injury when doing any other farm task (Stallones & Beseler, 2003). This increased risk of injury on a farm may be due to a lack of experience with tasks that women infrequently conduct (Meeker et al., 2002).

The use of chainsaws in forest management activities is common for professional loggers and family forest landowners (Esteban et al., 2013; Lindroos et al., 2005), yet chainsaws are inherently dangerous and can cause significant bodily injury (Esteban et al., 2013; Hiesl & Steele, 2022; Pardo

Ferreira et al., 2022). Because women are more likely to be at a higher risk for farm-related injuries, chainsaw safety training programs can reduce the risk of injury by training participants in the proper safety gear and handling procedures. However, such training programs have historically been focused on male participants and, more often, were based on the needs of professional loggers (Hiesl & Steele, 2022). Women-focused chainsaw training programs within the Women Owing Woodlands network across the United States have experienced great success and clearly demonstrated the need for such programs (Hubbard, 2020).

In response to the lack of training for women related to forest management activities that provides a welcoming and inclusive environment, we developed a basic chainsaw safety and handling program focused on female forest landowners in South Carolina. In addition to offering the workshop to female forest owners, we also offered the workshop to two groups of male participants. We conducted a survey of participants in the female- and male-dominated groups that was aimed at (a) documenting the value of the training program, (b) identifying differences between the male and female participants, and (c) revealing future forestry training needs that Extension may offer.

METHODS

Between September 2021 and April 2022, we conducted four hands-on chainsaw safety training workshops focused on and geared toward female forest landowners as part of the South Carolina Women Owing Woodlands network. In the same time frame, we conducted two additional workshops with an exclusively male audience (one female participant was included in one male-dominated workshop). Designed for novice chainsaw users who may occasionally clean up fallen trees and limbs around their yard or woodlot, the workshops focused on personal protective equipment (PPE), safety features of chainsaws, general chainsaw specifications, maintenance (powerhead, bar, chain), fueling and lubrication, basic cutting techniques using different sized chainsaws (top-down, bottom-up, and bore cutting), bucking logs, and tension in logs and limbs.

Following each workshop, we asked participants to complete a program evaluation. Before and after knowledge of chainsaw safety and handling questions used a 5-point Likert-type scale of “Not knowledgeable at all” to “Extremely knowledgeable” to gauge chainsaw selection, PPE, chainsaw safety features, basic chainsaw maintenance, delimiting, and bucking logs. We also asked about ownership of a chainsaw, including type (electric [corded], battery, or gas-powered), and plans for purchasing a chainsaw in the next 12 months. The demographic information collected included gender, age, ethnicity, race, amount of forest land owned, and length of ownership. Lastly, we collected information on the like or

dislike of an all-female workshop (only included with the four workshops attended by women), the likelihood of attending another South Carolina Women Owing Woodlands workshop, and additional topics for future workshops.

We used Fisher’s exact test to look for significant differences in responses between female and male participants in their initial knowledge of chainsaw safety and handling. This test was chosen over the chi-square test due to the small sample size of less than five for one or more of the cells in the associated contingency table. We used Welch’s *t* test to compare the forestland ownership length between male and female participants.

RESULTS

We had 32 participants (20 female, 12 male) attend the workshops. The post-program evaluations had a 100% response rate, although some participants did not answer all the questions.

PARTICIPANT DEMOGRAPHICS AND FOREST OWNERSHIP

Ages of male and female participants ranged from the 18–29 bracket to the 70 or older bracket. For this workshop series, the age range of female participants was bimodal, with many participants in the 30–39 and the 60–69 age ranges, but it also consisted of two participants over the age of 70 (see Table 1).

Table 1. Age Range and Distribution of Male and Female Participants

Age range	Female (<i>n</i>)	Male (<i>n</i>)
18–29 years	1	1
30–39 years	6	1
40–49 years	3	6
50–59 years	2	2
60–69 years	6	1
70 years or older	2	1

Table 2. Reported Forestland Ownership of Male and Female Participants

Size range	Female (<i>n</i>)	Male (<i>n</i>)
Less than 10 acres	5	1
10–50 acres	5	2
51–100 acres	3	0
101–250 acres	0	1
251–500 acres	2	0
None	1	1
No response	4	7

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In contrast, most male participants were in the 40–49 age range. Thirty respondents reported their ethnicity as non-Hispanic or non-Latino, one as Hispanic or Latino, and one did not answer the question. When asked about their race, 29 participants reported being White, one reported being Asian (female), one reported more than one race (male), and one did not answer the question.

Forestland ownership reported by participants ranged from less than 10 acres up to 500 acres. Half of the female participants reported owning 50 acres or less, while three-quarters of the male participants either did not answer the question or did not own forestland (see Table 2). The average ownership length reported was 10 years (± 8.8 years), with no significant difference between male and female participants ($p = 0.880$). The shortest and longest reported ownerships were 1 year and 30 years, respectively, with a median ownership length of 8 years.

PARTICIPANTS' KNOWLEDGE OF CHAINSAW SAFETY AND HANDLING

Responses related to the chainsaw safety and handling pre- and post-knowledge items tended to be clustered at the high and low extremes of the scale, thus potentially causing a misinterpretation of the data (Sullivan & Artino, 2013). Further,

because differences between the response categories may not have been interpreted the same by females and males, or even by individual respondents, and did not have equal distribution across responses, we combined the responses of “Not knowledgeable” and “Slightly knowledgeable” to represent limited knowledge and responses of “Moderately knowledgeable,” “Very knowledgeable,” and “Extremely knowledgeable” to represent advanced knowledge (Clason & Dormody, 1994; Sullivan & Artino, 2013).

Male and female participants exhibited significant differences in their knowledge about chainsaw safety and handling before the workshops. All female participants had limited knowledge of chainsaw selection ($p < 0.001$), basic chainsaw maintenance ($p < 0.001$), and bucking felled trees ($p < 0.001$), and only a few had advanced knowledge in selecting PPE ($p = 0.005$), chainsaw safety features ($p < 0.001$), and delimiting felled trees ($p = 0.002$) before the workshop compared to male participants, who presented with more advanced knowledge (see Figure 1). Looking at the responses to the same questions after the workshops, most female participants moved from limited knowledge to advanced knowledge levels. Similarly, male participants advanced to higher knowledge levels within the advanced knowledge category. One completed survey by a female participant showed a rating of limited knowledge

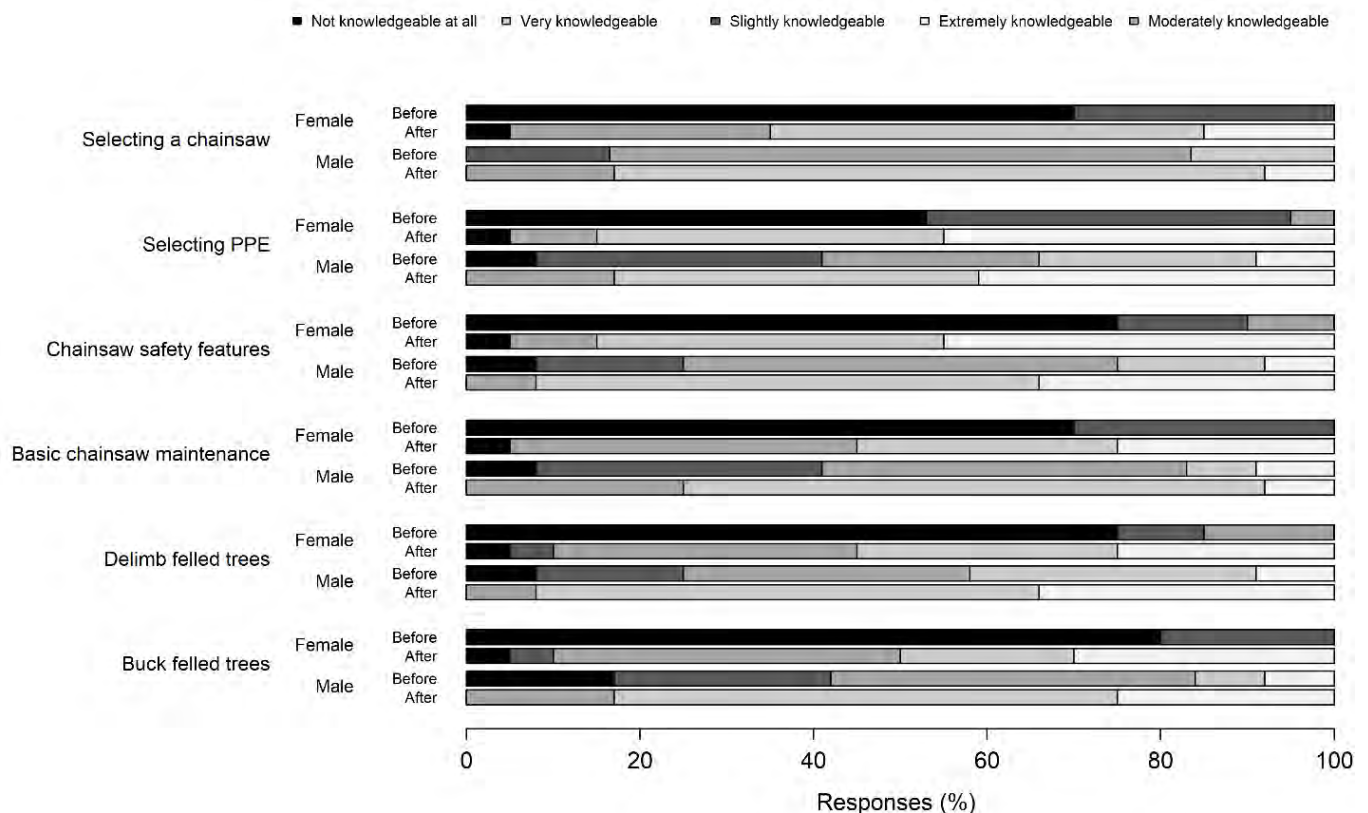


Figure 1. Knowledge of chainsaw safety features and handling reported by male and female participants before and after the workshop on a 5-point Likert scale.

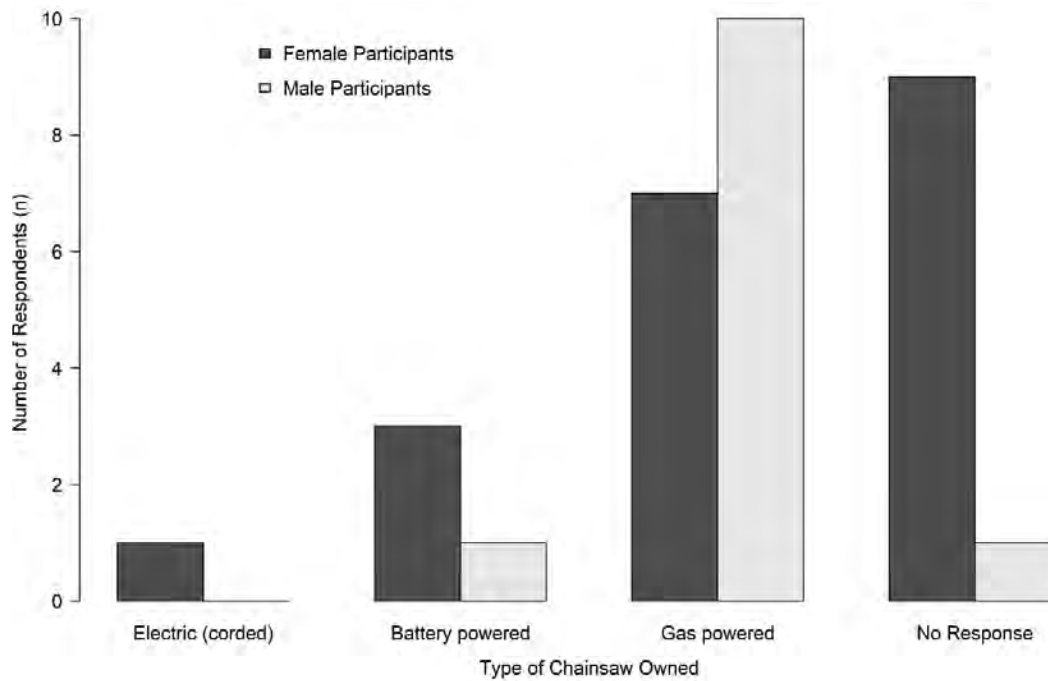


Figure 2. Participant response to the question of what type of chainsaw they own.

for all six safety and handling questions before and after the workshop. At that workshop, all participants verbally agreed that the workshop was beneficial and that they had all improved their skills. The same participant also reported to be slightly knowledgeable in one of the topic areas but then reported to be not knowledgeable at all after the workshop, possibly indicating that the participant misread the categories when filling out the survey.

All the male ($n = 12$) and 65% of the female participants ($n = 13$) reported owning a chainsaw, while 35% of the female participants ($n = 7$) reported not owning a chainsaw. When asked what type of chainsaw they owned, 22 participants provided an answer, showing that female participants owned a higher proportion of battery-powered and electric (corded) chainsaws than did male participants (see Figure 2). Although none of the male participants planned to purchase a new chainsaw within the next 12 months, eight female participants reported that they planned to purchase a chainsaw, and nine indicated that they might purchase a chainsaw. Four reported that they had no intention of buying a chainsaw in the next 12 months. One male and one female respondent did not respond.

QUESTIONS FOR FEMALE PARTICIPANTS ONLY

When the female participants were asked whether they liked or disliked an all-female learning environment, 18 liked having only females in a workshop, and two had no preference. None of the participants reported disliking only females in the workshop. When asked about the likelihood of the participants attending a future South Carolina Women Owning Woodlands workshop, 14 reported to be extremely likely, two

to be somewhat likely, and four to be extremely unlikely to participate in another workshop.

When asked about additional workshop topics they were interested in, seven female participants reported being interested in a tree-felling workshop, and four reported various topics, from chainsaw sharpening and maintenance to pruning and trailer backup. Nine of the female participants did not provide an answer to that question.

DISCUSSION

Nationwide, family farms and forests are shifting from male-centered ownership to a higher proportion of female owners (Butler et al., 2018; Strong et al., 2013). Women more frequently inherit than purchase forestland, in part because they tend to live longer than their spouses or may inherit from a family member (Butler et al., 2018). However, they have become increasingly engaged in forest management, with an increase in women-focused education programs (Redmore & Tynon, 2010). As the involvement of women in forest management activities is increasing, so is the need for technical training programs focused on women.

Our chainsaw safety training program evaluations showed that women often have little to no technical knowledge at the beginning of a workshop. This lack of knowledge is not surprising, as women have historically relied on their spouses to conduct more technical work or only infrequently performed such tasks (Meeker et al., 2002). Also, women are less likely to be active in forestry organizations that provide educational outreach to landowners, missing opportunities for instruction in land management practices and equipment

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safety training (Meeker et al., 2002; Redmore & Tynon, 2010). The number of female workshop participants owning a battery-powered or electric (corded) chainsaw could be attributed to not wanting to use a pull cord to crank and fewer maintenance requirements (Neri et al., 2022). Also, more than half of the female participants were not knowledgeable on the selection of PPE, although cut-resistant chaps or pants will prevent the most severe injuries when using battery-powered or electric saws (Hiesl & Steele, 2022). This lack of information may indicate that they perceived these saws as being less dangerous than gas-powered saws, creating a false sense of safety in not using appropriate PPE.

Although most female participants reported being likely to take part in another South Carolina Women Owning Woodlands workshop, four female participants reported that it was very unlikely that they would. We know from conversation with the participants that three of them were planning to leave the state for job opportunities shortly after the workshop, possibly explaining the answer of being unlikely to participate in future workshops. The fourth response may have been due to the same reason; however, we do not know for sure. In general, the consensus among female participants was that they would like to participate in future South Carolina Women Owning Woodlands workshops. Thus, there is a demonstrated need to offer training in environments where women feel safe, welcome, and empowered to learn.

CONCLUSION

Given the traditionally gendered nature of forestry/forest management activities, women are less likely to participate in forest management activities or in Extension forestry educational programs. Women who do participate in educational or Extension programming may experience microaggressions, leading to a further decline in participation. However, the women-only chainsaw training classes provided participants with an opportunity to gain self-confidence in their abilities to operate common forest management tools and potentially offered a path for overcoming other barriers to participation in forestry/forest management activities. Several participants suggested topics for future Extension programs, including advanced chainsaw-related topics, further showing an opportunity to diversify Extension program offerings geared toward women. And, most importantly, women-only Extension programs would help increase the transfer of knowledge to a traditionally marginalized segment of forest landowners.

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