Small-scale Forestry (2021) 20:457–478
https://doi.org/10.1007/s11842-021-09476-7

ORIGINAL RESEARCH

Applying the Transtheoretical Model of Change to Legacy Planning Decisions

Michael R. Quartuch[1] · Shorna Broussard Allred[1,4] · Ezra Markowitz[2] · Paul Catanzaro[3] · Marla Markowski-Lindsay[3]

Accepted: 20 February 2021 / Published online: 6 March 2021

Abstract

Approximately 1.2 million family forest landowners (FFOs) manage nearly 37 million acres of forestland in five New England states. This means that efforts to sustain and conserve forests in the region are contingent upon short- and long-term management decisions of these owners. We applied the transtheoretical model of behavior change to understand which activities and behaviors FFOs have pursued in relation to forest legacy planning. We conducted a regional mail survey of 2500 FFOs across Maine, Massachusetts, Vermont, and New York. Findings indicate that the majority of FFOs are preparing for or are currently engaging in beginning-level legacy planning decisions while few are thinking about nor planning for more advanced-level decisions. Findings from three stepwise multiple regression models also provide support for predicting a substantive amount of variance in FFOs' decisions to engage in beginning-level and conservation-oriented planning decisions.

Keywords Decision-making · Forest landowners · Behavior change model · Landowner behavior

Study was conducted while Dr. Quartuch was employed as a postdoctoral research associate at Cornell University.

✉ Michael R. Quartuch
mike.quartuch@state.co.us

[1] Department of Natural Resources, Center for Conservation Social Sciences, Cornell University, Ithaca, NY, USA

[2] Department of Environmental Conservation, University of Masschusetts – Amherst, Amherst, MA, USA

[3] Department of Environmental Conservation, Family Forest Research Center, University of Masschusetts – Amherst, Amherst, MA, USA

[4] Department of Natural Resources and the Environment, Center for Conservation Social Sciences, Cornell University, Ithaca, NY, USA

Introduction

Family forest owners (FFOs) control about 34% of the forestland in the U.S. (Linkes et al. 2010; Butler et al. 2020) and account for more than 37 million acres of forestland across five states in the northeastern U.S. (New Hampshire, New York, Maine, Massachusetts, and Vermont). The decisions of these 1.2 million FFOs in the northeast are critical—owners' decisions to sell, parcelize, develop or to conserve their land have far-reaching consequences for social, cultural, economic, and ecological attributes associated with private forests and the public benefits that they provide. Thus, efforts to sustain and conserve forests in the region are contingent upon understanding the management decisions of current owners.

Despite the importance of these decisions in both the short- and long-term, there is a relative dearth of information about FFOs' forest legacy planning intentions and the factors that influence decision-making in this context. Yet it is critically important that we better understand both what FFOs intend to do with their land after they pass as well as why they intend to act this way so that resource managers, extension agents, policymakers and others can more effectively engage with these decision makers. Because of the magnitude of forest legacy actions—which include cognitive and affective (or emotional) decisions and occur over long time horizons—we might expect that FFOs occupy different stages in a continuum of planning process steps. For example, some owners have likely made decisions about the future of their forestland and are in the process of carrying out those decisions while others may not be aware of or are only beginning to consider their options.

Forest legacy planning actions aimed at maintaining intact forests can help address issues of forest parcelization, the splitting up of large tracts of forestland into smaller segments among more owners (Gobster and Rickenbach 2004), and forestland conversion (e.g., Schmidt and McWilliams 2000). Most FFOs are concerned about increasing development and forest parcelization (Kilgore et al. 2015) yet few take formal conservation-based legacy planning actions to avoid forest conversion and parcelization (Markowski-Lindsay et al. 2017). This gap between what owners say they want to happen to their land and what decisions they are actually making (or not making) highlights a critical need for additional research into the factors that affect FFOs' legacy planning decisions.

Practitioners and scholars know very little about the psychological predictors of FFOs' legacy planning intentions. Further complicating matters is the inherent difficulty in talking about and planning for what will happen after one dies. Simply put, people are uncomfortable talking about their own death and often avoid doing so (Greenberg et al. 1986). Additionally, it is difficult to predict FFO behaviors/intentions related to selling, parcelizing, and developing land (Kilgore et al. 2015), in part, because these decisions happen across multiple discrete steps (e.g., determine the value of the land, work with a surveyor, hire an attorney, etc.) and are spread out over time. As such, we applied a behavior change model that can help scholars and practitioners better understand which forest

legacy planning activities FFOs are considering, are currently implementing, or have already done. Specifically, we applied the transtheoretical model of behavior change (TTM) to examine FFOs' legacy planning intentions and behaviors and to understand why they are (or are not) interested in various actions.

Our research contributes to broadening the application of the TTM model in a novel domain, forest landowner behavior, while also providing valuable insights that practitioners and others can use to create targeted messages that resonate with individuals who are in a particular stage in the forest legacy planning cycle, ultimately helping them make better long-term decisions regarding their land.

Theoretical Framework

The transtheoretical model of behavior change (TTM) provides a framework to examine people's readiness to change their behavior. It has been widely applied across behavioral and health fields to understand, predict, and, in some cases, create interventions addressing preventative or "risky" health behaviors including: mammography screenings, smoking (Prochaska and DiClimente 1983), diet and exercise (Mastellos et al. 2014), stress management (Riley, Toth, and Fava 2000), and substance use/prevention (Carbonari and DiClemente 2000). It has also been loosely applied within the environmental field to examine alternative modes of transportation use (Thigpen, Driller, and Handy 2015) travel behavior (Gatersleben and Appleton 2007; Parkes et al. 2016) and energy conserving behaviors (He et al. 2010).

The TTM incorporates a suite of cognitive, affective, and behavioral processes. "The central organizing construct of the TTM is stages of change, the five stages that people move through as they prepare for and ultimately modify their behavior" (Fried et al. 2012, p. 26). The sequential stages include: precontemplation, contemplation, preparation, action, and maintenance (Prochaska and DiClemente 1983) but individuals may revert back to previous stages as they plan for and subsequently change their behavior (Sutton 2001). Three additional constructs—decisional balance, processes of change, and self-efficacy—when used in tandem with the stages of change can help identify why someone is in a particular stage with respect to changing his/her behavior.

During pre-contemplation, an individual has not yet thought about nor considered changing his/her behavior. Contemplation, as the name implies, refers to individuals who are beginning to think about or consider changing his/her behavior. Preparation begins when individuals intend to engage in a behavior in the next 6 months and start making changes in their lives to do so (Prochaska and DiClimente 1983). During the later TTM stages, individuals are either in the process of engaging in the new behavior (i.e., action stage) or have changed their behavior and are attempting to sustain it (i.e., maintenance stage). It is important to note that individuals may not necessarily proceed through each of the five stages in a linear fashion. In most cases, individuals will stagnate in one stage for an extended period of time or even revert to earlier stages in the process (Gibbison and Johnson 2012; Lamb and Joshi 2004).

Additionally, it is important to understand how cognitive, affective, and behavioral processes assist or prevent individuals from proceeding through the stages of change.

Decisional balance (DB) represents an attitude or an evaluative assessment of the pros and cons of engaging in a particular behavior (Fried et al., 2012). As individuals progress through the stages of change, DB shifts in critical ways. For example, when individuals are in the pre-contemplation stage, the cons associated with changing one's behavior tend to outweigh perceived potential benefits (Medvene et al. 2007). As individuals advance to later-stages of the model, they begin forming more positive attitudes about modifying their behavior and the pros of changing typically outweigh the cons (Prochaska et al. 2008). Other factors such as belief saliency and awareness of or experience with certain behaviors also play a role either nudging individuals through the stages of behavior change or not (Fried et al. 2010; Sudore et al. 2008).

Processes of change (POC) refer to activities people use to progress through the stages of change and include cognitive and behavioral processes (Prochaska et al. 2008). Cognitive factors including consciousness raising are more prevalent during earlier stages, whereas behavioral processes such as helping relationships are present during both early and late-stage behaviors. For example, Gibbison and Johnson (2012) found social support, specifically from close friends, to be a critical factor in initiating (preparation stage) and maintaining (maintenance stage) exercise behaviors among adults.

Lastly, self-efficacy, a construct advanced by Bandura (1977), describes an individual's belief that s/he has control over whether to engage in a particular behavior. Self-efficacy is an important component of the TTM and other behavior prediction models (Armitage and Arden 2002). Gebrehiwot and van der Veen (2015) provided support for the importance of self-efficacy as a predictor of farmers' behaviors in both contemplative and action stages and evidence suggests that self-efficacy increases as individuals proceed from preparation to maintenance stages (Prochaska, Wright, and Velicer 2008).

Research Questions

The goal of this study was to understand whether FFOs are engaging in forest legacy planning behaviors and to determine the extent to which important attributes influence these decisions. Specifically, two research questions guided this inquiry:

1. What is the distribution of FFOs in New England across the TTM stage(s) with respect to forest legacy planning decisions?
2. To what degree do ownership motivations, self-efficacy, processes of change including helping relationships and consciousness raising, as well as important socio-demographic and landowner characteristics influence forest landowners' legacy planning decisions?

Literature Review

Private forest landowners own land for consumptive and non-consumptive purposes. Many FFOs report that amenity-related benefits including beauty, wildlife habitat, and nature protection are among the most important reasons why they

own their forestland (Butler et al. 2020), whereas other reasons to own land such as timber harvesting are often seen as less important (Côté, Gilbert, and Nadeau 2015). Additionally, most owners are interested in passing on forestland to future heirs (Butler et al. 2020). Leaving a legacy for future owners' enjoyment/use is important to many FFOs, highlighting the emotional attachment and sense of responsibility many owners feel toward both biophysical and social attributes associated with their property (Gruver et al. 2017). These individuals and families are often passionate about wanting to "do the right thing" for their land, which oftentimes involves avoiding behaviors they believe will damage the land (Quartuch and Beckley 2013). FFOs who are interested in conserving forestland are able to do so through a variety of approaches, including placing a conservation easement on some or all of the property, limiting certain types of development, creating a will that specifies how land will be divided among heirs or, establishing a trust, partnership or limited liability company (LLC) to maintain the property.

Although the land management options described in the preceding paragraph are often viewed positively by natural resource professionals, recent research finds that most owners are unaware of these opportunities and few actively manage their land (Schnur et al. 2013). In the absence of such knowledge, some owners may feel "forced to parcelize" (Gruver et al. 2017, p. 11). A study of FFOs in four New England states found that the number of respondents who have a will controlling their land use is only around 10% (Markowski-Lindsay et al. 2018) and nationally, only about 24% of FFOs have a written forest management or stewardship plan. Less than 10% of owners have a conservation easement or green certification (Butler and Leatherberry 2004; Butler et al. 2020). Thus, there exists a large contingent of FFOs in the U.S. who might benefit from learning about forest legacy planning options available to them.

The legacy planning decisions of FFOs are also influenced by their children or future heirs. Differing goals and financial circumstances, varying levels of attachment to the land, dealing with issues of fairness, and distance from the land can all complicate the process of making a decision about the land's future (Catanzaro et al. 2014; Kelly, Germain, and Mack 2016). FFOs who cite that their primary legacy planning goal for the land is family related are often hesitant to restrict the use of the land in order to provide maximum options for their children (Kelly et al. 2016; Markowski-Lindsay et. al. 2018).

The relatively small percentage of FFOs who are currently engaged in proactive legacy planning actions also highlights the complexity involved in making decisions that promote conservation and stewardship goals (Schnur et al. 2013). When an unexpected event occurs, especially an unforeseen health-related concern, the only option available to an owner may be selling some or all of their land for development, selling timber, or selling land for a conservation easement. This may even occur within families or among individuals who had no intention to develop or sell their land. For example, in qualitative interviews with professionals working with FFOs in Massachusetts (Markowski-Lindsay et al. 2016), professionals indicated that many FFOs expressed a deep sense of attachment to their land yet they felt "forced" into decisions that ran counter to their conservation intentions. In addition,

the goals of landowners to keep the land undeveloped or in the family may differ from the goals or needs of their heirs (Kelly et al. 2016).

Forest Landowner Decision-Making

A small but growing body of recent work on the topic has begun to reveal a number of psychological, contextual, structural and socio-demographic factors that appear to play important roles in promoting and inhibiting forest-related legacy planning (Markowski-Lindsay et al. 2017; Gruver et al. 2017; Withrow-Robinson et al. 2013). In early work on the topic, Broderick et al. (1994) found that respondents' age and educational attainment level were both positively associated with interest in keeping forests protected from development. More recent work by Catanzaro et al. (2014) indicated financial and non-financial costs (e.g., concern about heirs' desires, emotional attachment) involved in making forest legacy planning decisions can inhibit positive action. In addition, psychological and social factors also influence decision-making in this domain. For example, a desire to provide heirs with a legacy, avoidance of intra-familial conflict, and attitudes toward the autonomy of future generations to make their own land management decisions have all been found to affect forest legacy planning actions (Withrow-Robinson et al. 2013; Catanzaro et al. 2014).

Forest legacy planning decisions are highly complex and sometimes contentious, often involving multiple decision-makers in the case of joint ownerships, which can introduce challenging inter-personal dynamics. They are also challenging because they involve making decisions in the present that have long-term impacts, often on other people. Additionally, legacy planning decisions require that those involved discuss their own health, incapacity, and death. These conversations are less likely to occur especially when individuals are currently in good health (Fried et al. 2010; Sudore et al. 2008). In these cases, people tend to adopt an "out-of-sight, out-of-mind" perspective because the saliency of such decisions feels far removed from their current state.

Multiple psychological factors also work to complicate and sometimes derail decision-making in such situations, including inter-temporal discounting, psychological distance, and high levels of outcome uncertainty (Wilson et al. 2015). Yet other research suggests that some features of forest legacy planning decisions are amenable to well-designed, targeted behavioral interventions (e.g., highlighting legacy motives, shifting upfront costs into the future) that may facilitate improved decision-making by better aligning landowners' decision with their stated preferences and values for preservation and stewardship (Zaval et al. 2015).

Decisions with a Long-Time Horizon: Advanced Care and Financial Planning Literature

Similar to forest legacy planning decisions, which unfold over long time horizons, practitioners in health care and financial planning fields have used the TTM to develop programs encouraging people to plan for their future. Specifically,

researchers have used the TTM to examine advanced care planning (ACP) decisions (e.g., completing a living will) (Fried et al. 2010) and financial planning actions (e.g., setting financial goals, reducing debt) (Shockey and Seiling 2004). Irrespective of the long-term behavior under investigation, several notable similarities exist across fields and can provide additional insight into why FFO legacy planning decisions are (or are not) occurring. First, people tend to be in action or maintenance stages with respect to ACP and financial planning behaviors that are less complicated or involve less commitment (Fried et al. 2010; Sudore et al. 2008). Second, scholars have identified a gap between attitudes about behavior change and actually changing one's behavior. For example, most people are aware that they should be planning for their financial security but simply are not. Others are reluctant to change their behavior even after they've experienced negative outcomes associated with inaction (O'Neil and Xiao 2006, 2012; Sudore et al. 2008). Thus, even individuals with a high degree of issue salience and direct experience may not always make the most optimal decision.

Lastly, social support and the corresponding emotions associated with it are important motivational factors in people's ACP and financial planning decisions during different stages of behavior change. For example, Rowley et al. (2012) provide evidence about the ways lack of social support from family members, especially early in one's life, resulted in negative emotions and subsequently poor financial decisions as adults. Similarly, individuals who had the support of friends and family during contemplation and preparation stages were more motivated to start and continue exercising over time (Gibbisson and Johnson 2012).

Research Methodology

Study Region and Sampling Frame

The study was conducted in portions of four northeastern states including Maine, Massachusetts, New York, and Vermont. This region was selected due to high forest cover (73% of land is forested in this region), much of which (82%) is privately owned (Butler et al. 2016). Within each state, FFOs owning at least 4 hectares (10 acres) of land in two forested landscapes under medium to high threat of development (housing density) were selected from each state (Stein et al. 2005). A stratified random sample based on property size (half above 16 hectares and half below to ensure large parcels were represented) was drawn from municipal and state property tax records for forested and rural property classifications in each state (625 per state for a total sample size of 2,500). This approach ensured a distribution of parcel sizes in each study area despite concentration of ownerships in smaller size classes. We selected two areas in each state with forest cover and parcel sizes that are "large enough to sustain active forest management, contain critical public forest benefits (e.g. water quality, biodiversity, recreation), but are predicted to be areas of medium and high forest conversion in the continuing decades." (Markowski-Lindsay et al. 2018, p. 358; Stein et al. 2005). The stratified random sample was drawn from publicly available property tax assessor parcel data in the following watersheds and counties in each state: the Lower Penobscot River and

Saco watersheds in Maine, the Millers and Westfield watersheds in Massachusetts, the Susquehanna and Onondaga Lake (Cortland and Onondaga counties) and Delaware River and Mohawk watersheds (Delaware and Green counties) in New York State, and Orleans and Rutland counties in Vermont. Where a FFO owned more than one property, we combined multiple ownerships into one record, retaining the largest parcel.

Survey Measures

The survey instrument contained questions about (1) beginning, intermediate, and advanced legacy planning behaviors, (2) motivations for owning land, (3) TTM support behaviors, (4) future plans for their land, and (5) socio-demographics. Beginning legacy planning behaviors were measured with the following 4 items, have conversations with family or friends, talk with a professional (for example, lawyer, accountant, land trust), gather information about my options, and go through the process of deciding between my options. We measured intermediate and advanced legacy planning behaviors with the items, develop a will, set up a trust, create an LLC, LLP, or family partnership, set up a corporation, and place a conservation easement or restriction on my land. The response categories for all legacy planning behavior survey items were: (5) have not thought about it, (4) thought about doing it but have not, (3) plan to do it in the next year, (2) I am doing this now, (1) have already done this, and (0) I don't plan to do this. The response categories gave respondents the opportunity to indicate what TTM stage they were in in terms of planning and action (Medvene et al. 2007).

The ownership motivation questions were taken from the National Woodland Owner Survey (Butler 2008) and measure the reasons for land ownership. The survey items were: protect nature, protect water, protect wildlife habitat, firewood, timber products, non-timber products, hunting, privacy, raise my family, and recreation (other than hunting) (Table 1).

The TTM support behaviors were measured using a 5-point, agreement scale (i.e., strongly disagree-to-strongly agree) and included consciousness-raising (I know where to go for information), helping relationship-professional (I know professionals who can help), helping relationship-personal (My family agrees on how to move forward), self-efficacy (I am confident that I know how to move forward), and self-efficacy-financial (I have enough financial resources to move forward). Future plans were measured by asking: Do you plan to pass any or all of this land to heirs (Yes/No/Have not decided)?; Do you plan to sell any or all of this land (Yes/No/Have not decided)?; Have development rights been sold or donated on this land by either you or a previous owner (Yes, No, Don't know)? Socio-demographic questions assessed respondents' age, gender (male/female), total acres owned, and the year they acquired their land.

Survey Implementation

We implemented the mail survey to FFOs in Massachusetts, Vermont, Maine, and New York in the spring of 2015 using a modified Dillman tailored design method (Dillman et al. 2014). Our four-wave approach included: (1) pre-notification letter (sent 3 days in advance of survey), (2) cover letter and survey, (3) thank-you/

Table 1 Principal components analysis and internal reliability of landowner motivations

Reasons to own land (motivations)	Mean (SD)**	Factors*			
		Protecting nature	Consumptive purposes	Family interests	Cronbach's alpha
Protect nature	3.98 (1.05)	.920			.885
Protect water resources	3.79 (11.15)	.894			
Protect wildlife habitat	4.13 (.998)	.861			
Firewood	2.89 (1.40)		.773		.713
Timber products	2.60 (1.38)		.835		
Non-timber products	2.42 (1.36)		.619		
Hunting	2.94 (1.62)		.650		
Privacy	4.21 (1.06)			.780	.607
Raise my family	3.62 (1.44)			.805	
Recreation (other than hunting)	3.63 (1.26)			.552	
Variance explained		24%	23%	17%	

*Total variance explained = 64%

**SD = standard deviation. Mean calculated based on 5-point, Likert scale from 1 (Not important) to 5 (Very important)

reminder postcard (sent 1 week after previous mailing) and (4) cover letter and 2nd copy of survey (sent 3 weeks after previous mailing). The survey was formatted for Teleform OCR scanning. To assess for nonresponse bias, a telephone survey of nonrespondents was implemented in September and October 2015.

Analysis

Descriptive and inferential statistics were conducted using IBM SPSS Statistics 24. Means were calculated for all socio-demographic variables (gender, age, and education), land/owner characteristics (total acres, wooded acres, year of acquisition, how land was acquired, and primary residence), behavioral intentions (pass land to heirs, sell, or develop property), each of the nine estate planning decisions across stages of behavior change, and for each of the three TTM support factors (self-efficacy, consciousness raising, and helping relationships).

We assessed non-response bias via two methods. First, we compared respondent and nonrespondent answers on six questions (listed below) on the mail survey using t-tests. Second, we conducted a comparison of early responders (first quartile based on survey response date) and late responders (2nd, 3rd, and 4th quartiles based on survey response date) across the same variables used in the telephone survey of nonrespondents. The variables tested in both the telephone survey of nonrespondents

and the comparison of early and late responders were acreage of forestland owned, year born, gender, highest education completed, year of land acquisition, and whether they have a will. The p-value for the t-tests was set at $p < 0.05$.

We used principal components analyses (PCA) to identify the underlying empirical structure of our hypothesized beginning, intermediate, and advanced legacy planning decisions and to reduce the data. The factor scores were used to generate summative scales for landowner legacy planning decisions (e.g., beginning-level planning decisions) and served as dependent variables in subsequent regression analyses. These were appropriate to use for parametric statistics (Carifio and Perla 2007; Norman 2010; Murray 2013). We conducted a second PCA on reasons why respondents own land, operationalized as landowner motivations. The resulting factors were included in a linear multiple regression analysis as independent variables along with three discrete independent variables: self-efficacy, helping relationships, and consciousness raising. We used pairwise deletion for missing data and established p values at 0.05 significance. We also included socio-demographic and land/owner attributes in the regression model as independent variables. Both the landowner motivations and sociodemographic attributes were included because they are often important correlates of landowner behavior (Butler et al. 2016).

Results

Of the 2500 surveys mailed, 140 surveys were undeliverable and 789 surveys were returned for a 33% response rate. The telephone survey of nonrespondents revealed that there were no statistically significant differences between respondents and nonrespondents for the variables of acreage of forest owned, whether they have a will, age, and gender. Significant differences were detected at the $p < 0.05$ level for educational attainment. Nonrespondents were less educated ($M = 3.6$ which was between "some college" and "Associates degree") than were respondents ($M = 4.0$ which was "Associates degree").

In comparing early responders to late responders of the survey, we found significant differences at the $p < 0.05$ level on two variables, land acquisition and gender. Early responders acquired their land on average about four years before late responders (1989 and 1993, respectively) and they were also more likely to be male than were late survey responders (62% of late respondents were male whereas 76% of early respondents were male.)

Socio-Demographic, Land, and Owner Characteristics

The mean age of respondents was 63 years old and the majority (71%) were male. On average, respondents own approximately 77 acres of land (mean) and they have owned their land for 26 years (mean). For our respondents, 32% own 10–24 acres, 20% own 25–49 acres, 24% own 50–99 acres, 11% own 150–249 acres, and 7% own 250 acres or more. Overall, 76% of respondents in this study own 10–99 acres of

land or less. Approximately 60% of respondents live on or within one mile of their forestland.

Principal Components Analysis and Summative Scale

The first PCA resulted in a two-factor solution which accounted for approximately 65% of the variance in FFOs' legacy planning activities. Sampling adequacy was examined using the Kaiser-Meyer Olkin (KMO) measure and Bartlett's Test of Sphericity. The KMO was sufficient (>0.7) and the Bartlett's Test reached statistical significance (Tabachnick and Fidell 2013). The first factor comprised the majority of the cumulative variance (42%) and contained the first five items (Table 1). As such, it was labeled, "Beginning options." The second factor contained three items representing more complicated legacy planning options including: setting up a trust, creating an LLC, LLP or family partnership, and setting up a corporation. It comprised 23% of the variance and was labeled, "Advanced options." One item (i.e., placing land in a conservation easement) loaded on the "Beginning options" factor scale but was removed since it was practically different and more advanced than the "Beginning options" items. Including the conservation easement item in the "Advanced Option" scale reduced the Cronbach's alpha reliability to 0.598. Thus, we chose to retain conservation easement as a unique single item factor (i.e., "Conservation option") due to its importance as a conservation-oriented alternative to development. Next, we used each of the three factor scores to create discrete, summative scales which were included in the regression analyses as dependent variables (Carifio and Perla 2007).

The second PCA on landowner motivations resulted in a three-factor solution explaining approximately 69% of the cumulative variance in owner motivations (Table 1). Three items, owning land to enjoy beauty/scenery, to pass on to children or other heirs, and for land investment were removed due to cross-loading. The first factor comprised 24% of the unique variance and included items related to protecting nature, water, and wildlife resources. As such, it was labeled, "Protecting nature." Items in the second factor, "Consumptive purposes", comprised approximately 23% of the variance in motivations and included the items: for firewood, for timber and non-timber forest products, and to hunt. The third factor was labeled "Family interests" comprised 17% of the variance. Items in this factor included: to raise my family, for privacy, and for recreation other than hunting. Each of the three landowner motivation factor scores were included in the regression model.

Behavioral Intentions and TTM Supporting Behaviors

Over half (56%) of respondents intend to pass their land on to heirs (Table 2, upper portion). About 30% were undecided about doing so and the remaining 13% do not intend to pass on their land to heirs. Fourteen percent intend to sell some or all of their land (Table 2). Half (50%) of respondents *do not* intend to sell some or all of their land and slightly more than one-third (35%) were undecided about selling it. About 5% of respondents have sold development rights though the vast majority

(78%) do not intend to sell them. For the 56% (n = 781) of owners who intend to pass on their land to heirs, crosstabulations reveal that most have already taken actions such as conversations with family (43%), talking with professionals (30%), gathering information (29%), deciding between options (24%), developing a will (65%), or setting up a trust (34%). Fewer respondents planning to pass to heirs have set up a partnership (9%), corporation (6%), or conservation easement (16%). It is also telling that 25% of those with the intention to pass to heirs have not thought about talking with a professional. About 22% have not gathered information, and 11% have not thought about having conversations with family.

On average, respondents neither disagreed nor agreed with statements asking about TTM support mechanisms. The mean for TTM supporting factors ranged from 3.39 to 3.48 on a 5-point Likert scale (Table 2, lower portion).

Stages of Behavior Change

Overall, the most substantive differences between respondents' legacy planning decisions exist within the action and maintenance stage. For example, almost half (48%) of respondents are currently discussing the future of their land with family or friends or have already done so. Fewer (25%) respondents are talking with (or have already talked with) a professional about their legacy planning decisions and fewer still have placed land in a conservation easement (7%), created an LLC/family partnership (4%), or set up a corporation (2%). Additionally, 48% do not intend to place land in an easement; 55% do not intend to create an LLC/family partnership; and 66% do not intend to set up a corporation.

Between 16 and 28% of respondents are in the pre-contemplation stage for eight of nine forest legacy planning decisions (Table 3). Only 6% are in the pre-contemplation stage with respect to developing a will. Similarly, about 20–30% of respondents are in the contemplation and preparation stage for all but two legacy planning decisions (i.e., creating an LLC, LLP, family partnership, and setting up a corporation).

Table 2 Descriptive statistics for behavioral intention and TTM supporting behavior items

Behavioral intention	n	% Yes
Pass land to heirs	781	56.3
Sell land	783	14.3
Sale of development rights	735	5.4
TTM supporting behaviors		Mean* (SD)
Consciousness raising (e.g., *I know where to go for information*)	748	3.41 (1.07)
Helping relationships (professional) (e.g., *I know professionals who can help*)	743	3.39 (1.10)
Helping relationships (personal) (e.g., *My family agrees on how to move forward*)	656	3.48 (.983)
Self-efficacy (e.g., *I am confident that I know how to move forward*)	745	3.43 (1.07)
Self-efficacy (financial) (e.g., *I have enough financial resources to move forward*)	740	3.44 (1.11)

*Mean calculated using 5-point, Likert scale from 1 (strongly disagree) to 5 (strongly agree)

Overall, more than two-thirds (67%) of all respondents agreed or strongly agreed with statements about knowing where to go for information (consciousness raising) and 55% agreed that they knew professionals who could help them (helping relationships). Slightly more than half (53%) agreed that they have the skills and abilities to move forward with forest legacy planning on their own (self-efficacy). However, approximately one-quarter of respondents expressed neutral sentiments about knowing where to go, who could help, or having the skills and abilities to proceed with legacy planning decisions. In addition, about 25% disagreed—to some extent—with these statements as well.

Model Results

Model 1. Predicting Beginning Option Forest Legacy Planning Decisions

Overall, the first linear regression model—which included beginning option legacy planning behaviors as independent variables and stages of change as dependent variables—was statistically significant. Independent variables predicting approximately 25% of the variance in FFOs' decisions to engage in beginning legacy planning behaviors. Specifically, propensity to engage in beginning behaviors increased as education and acres owned increased. In addition, FFOs who believed they had the support from family members (helping relationships) and believed they knew where to go for information about legacy planning decisions (consciousness raising) were more likely to do so (Table 4). Ownership motivations were not a statistically significant predictor of beginning legacy planning behaviors.

The second, "Advanced legacy planning" model was statistically significant and predicted roughly 15% of the variance in FFOs' Advanced-legacy planning decisions (Table 4). The number of acres owned was the only statistically significant predictor variable (Table 4).

We tested a reduced model for the conservation easement option (3rd linear regression model) due to a limited number of respondents engaging in this behavior. Overall, this model predicted 54% of the variance in owners' decisions to place land in a conservation easement. Model results showed that inclination to use a conservation easement increased with education, ownership motivations to protect nature, and intention to sell development rights to land. TTM support mechanisms (consciousness raising, self-efficacy, and helping relationships) were not statistically significant predictors of conservation easement behavior.

Discussion

The TTM is a robust framework for understanding and predicting habitual individual-level actions (e.g., smoking, taking medicine on time), long-term planning decisions (e.g., planning for retirement), and corresponding interventions to address them (Prochaska and DiClimente 1983; Shumway et al. 2005). The efficacy of the TTM is often dependent upon the behavior(s) under investigation

Table 3 Percentage of landowners in each stage of the TTM across forest legacy planning behaviors

TTM stages	Pre-contemplation	Contemplation and preparation		Action and maintenance		
Property planning options	(%) Have not thought about	(%) Thought about, but haven't done it	(%) Plan to next year	(%) Doing this now	(%) Already done this	(%) Don't plan to do this
Conversations with family or friends about future of land (n = 699)	16	22	4	16	32	10
Gather information about options (n = 625)	20	24	6	12	20	18
Decide between my options (n = 628)	22	25	7	13	17	16
Talk with professional (Ex. lawyer) (n = 591)	23	22	6	5	20	23
Develop will (n = 739)	6	18	9	6	57	4
Place conservation easement/restriction on land (n = 395)	26	18	1	1	6	48
Set up trust (n = 487)	22	19	3	2	18	36
Create LLC, LLP, or family partnership (n = 339)	28	11	1	1	3	55
Set up corporation (n = 256)	27	4	1	1	1	66

Table 4 Linear regression of beginning legacy planning behaviors[a], advanced legacy planning behaviors[b], and conservation easement behavior[c] as the dependent variable

	Model 1 Beginning Options Standardized β (*p* value)	Model 2 Advanced Options Standardized β (*p* value)	Model 3 Conservation Option Standardized β (*p* value)
Socio-demographics			
Age	.051 (.211)	.063 (.436)	.012 (.842)
Education	.199 (< .001)**	.112 (.087)	.119 (.013)*
Gender	.072 (.027)	.034 (.589)	.034 (.466)
Total Acres Owned	.169 (< .001)**	.174 (.010)*	.051 (.299)
Year Acquired	− .098 (.014)	− .062 (.434)	–
Ownership Motivations			
Protect Nature	.043 (.179)	.028 (.660)	099 (.033)*
Consumptive	− .002 (.947)	− .108 (.106)	.046 (.344)
Family Interests	.005 (.875)	− .093 (.153)	.037 (.446)
Future Plans			
Pass to Heirs	.119 (.003)*	.116 (.247)	.031 (.673)
Sell Land	.083 (.038)*	.080 (.421)	− .025 (.730)
Development Rights	.107 (.001)*	.029 (.644)	.672 (< .001)**
TTM Support Behaviors			
Consciousness-raising	.139 (.011)*	.050 (.637)	.083 (.286)
Helping relationships (professional)	.089 (.103)	.023 (.828)	.047 (.544)
Self-efficacy	.042 (.417)	.105 (.309)	− .031 (.677)
Self-efficacy (financial)	− .012 (.772)	.054 (.508)	− .027 (.645)
Helping relationships (personal)	.105 (.008)*	.008 (.924)	− .038 (.523)
Model Statistics			
R^2	.246	.147	.541
Adjusted R^2	.231	.089	.510
F-statistic	15.768	2.532	17.308
p value	≤ .001	≤ .001	≤ .001

*$p < .05$, **$p < .001$

[a]Beginning legacy planning behaviors = conversations with family or friends about future of my land, talk with professional, gather information about options, go through process of deciding between my options, develop a will

[b]Advanced legacy planning behaviors = trust, partnership, corporation

[c]Place a conservation easement or restriction on my land

(Parkes et al. 2016), and whether the interventions are developed for individuals in a particular stage of behavior change (Velicer and Prochaska 2008). These attributes make the TTM an ideal framework with which to examine FFOs' long-term legacy planning behaviors. Several important findings can be gleaned from the regression analyses of beginning and advanced legacy planning decisions of landowners.

In two of the three models we were able to understand what variables predict FFOs' legacy planning decisions. In the "beginning-level" model, FFOs who had the support of family members and close friends and believed they knew where to go to find information about forest legacy planning were more likely to have done so. This finding corroborates those of Rowley et al. (2012) and Gibbison and Johnson (2012), highlighting the importance of social support in stimulating financially independent behaviors as well as initiating individuals into healthier lifestyles. Outreach and education efforts promoting the importance of social support with respect to beginning-level legacy planning decisions—especially those providing FFOs with examples of how to navigate conversations with people close to them—will likely resonate with FFOs who have not yet done so.

We also found that owners who are engaging in advanced-level legacy planning decisions are more likely to do so when they own larger tracts of land. This corroborates previous research indicating that FFOs who own larger parcels are more likely to engage in active forest management. Specifically, Butler (2008) found a significant, positive correlation between parcel size and timber harvesting motivations, having a written forest management plan, and having received forest management advice. The implications of this finding are important because they provide further evidence for promoting these behaviors among owners of larger tracts who have yet to consider advanced legacy planning decisions. This finding also illustrates that owners of smaller parcels may not believe nor understand how advanced legacy decisions could help them accomplish their ownership objectives.

The "Conservation option" model provides additional evidence about the importance of FFO motivations. Specifically, we found that FFOs who were motivated to protect nature, water, and wildlife were more likely to place their land in a conservation easement to meet their stewardship desires. We also found those who were more educated were more likely to place land in an easement. Each of these findings corroborates previous research. For example, Quartuch and Beckley (2013) determined that landowners in Maine were willing to tie the hands of future heirs in order to prohibit forestland development and maintain their personal stewardship ethic. Broderick et al. (1994) found a positive correlation between FFOs' educational attainment and protecting forestland from development. Practitioners can incorporate data about FFO's motivations in education and outreach efforts specifically appealing to owners' interest in protecting natural resources and highlighting ways to do so. The latter may help less-educated owners understand the importance of maintaining intact forestland especially for individuals who have not yet begun planning for the future of their forestland. Information delivery through local newspapers and magazines is effective in reaching early adopters while late adopters are influenced by economic benefits of forestry decisions and seek rational solutions (Korhonen et al. 2013).

It is also important to note that two of the TTM support behaviors—consciousness raising and personal helping relationships—were significant predictors of FFO's Beginning-level legacy decisions. However, they were not statistically significant predictors in the Advanced and Conservation easement models. This finding indicates that (1) TTM support behaviors are more important during beginning stages of forest legacy planning than they are for more advanced

decision making, and (2) there appears to be a threshold for supporting behaviors which, once overcome, are less critical in achieving advanced and conservation easement legacy outcomes. Research has demonstrated the important role that professionals play in helping guide landowner decision making (Hujala et al. 2009; Knoot and Rickenbach 2014; Korhonen et al. 2013). Landowners are more receptive to receiving information from professionals especially when they trust the individual(s) delivering the information (Gootee et al. 2010) and when there is congruence between the information provided and the owners background, knowledge, and previous experience (Hujala et al. 2009). Financial self-efficacy was not a significant predictor in any of the models, suggesting that the ability to pay for legacy planning may not be a limiting factor in taking beginning and advanced actions. This result is in contrast to previous literature indicating that financial costs can play a role in legacy planning actions (Catanzaro et al. 2014).

Findings from this study also revealed an interesting dynamic between beginning- and advanced-level legacy planning decisions. Most FFOs in our study were in the preparation, action, and maintenance stages with respect to having conversations about the future of their land with friends and family, talking with professionals about their land, and other beginning-level decisions. About one-quarter had considered engaging in these behaviors but have not yet done so. Given the importance of helping relationships, especially in early-stage behaviors, practitioners should find ways to facilitate discussions between FFOs and professionals and between FFOs and other landowners. There is precedence for doing so. Research suggests that positive peer-to-peer relationships among FFOs has proved advantageous at informing FFO decision-making (Hamunen et al. 2015). Forest landowners tend to communicate in non-hierarchical ways and express a mutual respect for one another regarding their experiences. This resonates with FFOs who have limited forest management experience (Hamunen et al. 2015).

One challenge with peer-to-peer networks is that some FFOs have very few peer relationships to draw upon. In these instances, they will choose, instead, to reach out to trusted experts (Korhonen et al. 2013). The complementary role of professionals in peer-to-peer learning has been documented previously (Hamunen et al. 2015; Broussard Allred et al. 2011). Thus, both professionals and peers can provide vital helping relationships for FFOs in the contemplation stage of beginning-level, legacy planning behaviors.

We also learned from this study that complex, advanced behaviors (e.g., creating an LLC, LLP; setting up a corporation, etc.) were not on the minds of the majority of FFOs in our sample. More than one-quarter had *never* thought about these actions and between half to two-thirds of respondents never intend to do so. Many FFOs may be unaware that such options exists or do not believe they could help them accomplish their long-term goals. Some support for the latter is evident in the financial planning literature which suggests that Americans tend to struggle with "financial practices that require analysis and calculation" and often delay making long-term, infrequent decisions (O'Neil and Xiao 2012, p. 43) until being forced to do so. Others may not wish to limit the decision making authority of future heirs (Kelly et al. 2016; Quartuch and Beckley 2013). The same situation

is less evident with respect to developing a will, which was undertaken at higher than average national levels by FFO's in our sample.

According to O'Neil and Xiao (2006, 2012), having a will is one of the top five or six financial practices with the lowest frequency of performance. Nationally, only about 44% of Americans currently have a will (Gallup 2016) but the percent of FFOs who have a will in this study is noticeably higher. Approximately 57% of respondents had already developed a will at the time they responded to the survey, six percent were currently doing so, and another nine percent plan to develop one in the next year. This may have to do with the fact that the FFOs in this study have land as an asset to plan for, whereas the 56% of American's from the Gallup poll are less likely to own 10 or more acres of forested land needing to be managed long-term.

What remains unknown is the extent to which forest legacy planning decisions were explicitly included in respondents' wills or if their wills reflect a general concern about personal belongings and non-forestland assets. Just as selling land is not always detrimental to forestland (i.e., selling to a land trust can be highly beneficial), having a will does not necessarily result in long-term forest sustainability. Many wills explicitly permit heirs to utilize property as they wish. Presumably, new owners could subdivide the property or parcelize it among multiple families. We recommend that future research explore the relationship between having a will and long-term forest legacy planning in more detail.

Conclusions

We found support for using the TTM to identify which stage FFO's are in with respect to planning for the future of their forestland. Results demonstrated strong evidence for predicting beginning-level and conservation easement landowner legacy planning decisions, though the TTM was somewhat less useful for understanding more advanced legacy planning decisions. Advanced-level FFO legacy planning decisions are inherently complex and often highly social. They typically involve multiple steps (or multiple behaviors) to accomplish a particular task (e.g., establishing an LLC) and they also tend to involve more than one person making decisions about the land. The TTM may only be able to partially capture such complex, social decisions suggesting a need to investigate sets of drivers for complex behaviors as distinct from beginning stage behaviors.

Limitations and Future Research

Conceptualizing behavior as occurring in a series of stages is worthwhile and deserving of further research, with the understanding that some critics (Prochaska 2009) argue that the TTM could be improved (Sutton 2001). One of the primary critiques of research using TTM focused on the inability of researchers to accurately measure behavior relative to the discrete stages (Sutton 2001) and whether behavior actually occurred in stages (Littel and Girvin 2002). However, the TTM's largest utility is in its ability to articulate the "instrumental acts" (Armitage and Arden

2002, p. 100) which are vital to undertaking the behavior of interest. This is where future research could be quite valuable—not necessarily focusing solely on the stages but rather, the dynamic nature of behavior and the key factors that facilitate whether one undertakes the behavior. Additionally, the question about development rights could be improved to be less ambiguous. The wording of this question in the survey was "Development rights for land can be sold or donated through a conservation easement or restriction. Have development rights been sold or donated on this land by either you or a previous owner?" Thus, owners who responded yes may not have sold development rights for a conservation easement but for another purpose, such as a restriction (e.g., state tax law).

As the legacy planning behaviors became more complex (e.g., setting up a corporation), the TTM model was not as effective in explaining the variance in behavior. Researchers interested in further study of landowner behavior related to advanced legacy planning behaviors should consider using models of decision-making that explain more dynamic behaviors and group decision making processes under uncertainty. Two examples include social practices theory and socioemotional selectivity theory. The former explores behavior change through the lens of cognitive, social, and cultural factors that influence the "practices" (or behaviors) of individuals and groups (Reckwitz 2002). The latter emphasizes the importance and role of temporal contexts in decision making and suggests that people's perceptions of time influence their motivations and corresponding goals. As people age they "…are reminded of the finitude of their lives, [and] attention shifts from future-oriented goals to emotionally meaningful goals" (Fung and Carstensen 2006, p. 248–249). Each of these theories departs from traditional models of human behavior. In addition, they offer a unique perspective that might resonate with FFOs who tend to be older, care deeply about their land, but struggle with how to pass it on to future heirs (Markowski-Lindsay et al. 2016).

Funding Funding for this research was provided by the US Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) under Award Number 2015-68006-23110, University of Massachusetts.

Declarations

Ethics approval This research project received Institutional Review Board approval as indicated in the IRB Authorization Agreement (IAA) between Cornell University and the University of Massachusetts for the NIFA Land Transfer Project (eProtocol: 2014-2261).

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