RESEARCH ARTICLE

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policy

In Forest and Intact: Designating Future Use of Family-Forest-Owned Land

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Much of the family-forest-owned land in the United States is expected to change hands as current ownerships grow older and pass on their holdings. To date, little research has been conducted on this ownership decision. Using mail survey data from the northeastern United States, we explore family-forest-owner (FFO) legacy planning. We summarized FFO interest in planning for the future use of their land. We found that nearly 50% of respondents believe that controlling future use of their land is important; and one-half to two-thirds of respondents are open to keeping most or all of their land forested and undivided. We investigated legacy priorities influencing FFO intentions and decisions to control use. FFO intentions to keep their land in forest use and intact have significant influence on designating future use. Further, FFOs have distinct legacy goals that significantly influence intention and behavior to designate future use of their land.

Keywords: estate planning, family forest owner, land conservation, land transfer, legacy

In the United States, family forest owners (FFOs) own 290 million acres of forestland, approximately 36% of the nation's forest (Butler et al. 2016a). Roughly 197 million of these acres are owned by FFOs over 55 years in age who hold at least 10 acres of land (Butler et al. 2016b). By influencing factors such as whether forests will be converted to non-forest use or whether ownerships will be divided into smaller parcels, the estate planning decisions of these aging FFOs will affect the resiliency of forest ecosystems and the many societal benefits that these systems provide. Finding ways for the forest community to maintain forests during this ownership transition is of paramount importance to maintaining their benefits.

Over the past several decades, much effort has gone into engaging landowners and increasing their participation in forest management (e.g., Forest Stewardship Program, Farm Bill programs). While these programs have sought to engage landowners in active forest management, research suggests that these programs do not influence FFO decisions related to their plans to sell or subdivide their lands (Butler et al. 2014, Kilgore et al. 2015). More recently, interest in conservation easements has grown, with emergent research focusing on describing the potential of these land protection tools (Ma and Kittredge 2011, Kelly et al. 2016). While conservation easements are an effective way to reduce forest conversion and parcelization, nationally only 3% of FFOs owning at least 10 acres report having a conservation easement on their land (Butler et al. 2016b). This low adoption rate suggests that conservation easements alone

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are not currently reaching enough FFOs to ensure that forest remains in forest use and intact during ownership transitions.

The concept of conservation-based estate planning (CBEP) emerged in response to the growing awareness of legacy planning decisions as an important conservation strategy and emphasizes the development of formal plans to keep some or all of an owner's land in its natural, undeveloped state (Catanzaro et al. 2014). CBEP includes the application of standard estate planning tools such as wills, trusts, and various forms of land ownership (e.g., Limited Liability Companies) to help landowners control the future ownership of lands and minimize parcelization. CBEP also includes tools such as conservation easements and current use tax programs. Conservation easements provide a permanent option for controlling land use and parcelization. Current use tax programs that include provisions for extending enrollment to a new owner (e.g., lien on the property) and penalties for withdrawing the land from the current use tax program can provide an important non-permanent option for landowners to control land use and discourage conversion past the tenure of their ownership. These distinct CBEP tools can be used in combination, tailored to meet FFOs personal and financial goals while also helping maintain public benefits.

Learning more about FFOs' interest in CBEP tools could help the forest community (e.g., foresters, conservation organizations, peer leaders) more effectively assist owners through the complexities of the legacy planning process. Establishing and acting on legacy priorities are complicated by the number of CBEP tools available and by the need to reconcile competing personal, family, and financial goals. Making estate planning decisions for land-based assets is dissimilar from financial assets, in part because of emotional attachments (Markowski-Lindsay et al. 2016), and they are often influenced by strong ties to the land (Creighton et al. 2016, Gruver et al. 2017). Studies of the future of FFO lands demonstrate the significance of demographic, attitudinal, and financial factors in shaping owners' interests in temporary and permanent land-use restrictions (Langpap 2004, Ma and Kittredge 2011, Mitani and Lindhjem 2015) and reveal differences in intentions for future activities on the land between inheritors and purchasers of forest land (Majumdar et al. 2009).

Reflecting on these research findings and thinking about how to support FFOs raises two fundamental questions: (1) To what extent are FFOs interested in planning for the future use of their land? and (2) What legacy priorities systematically affect preferences for designating, or controlling, the future use of their land? In this study, we used data from the northeastern United States to address both of these questions. To address the first question, we summarized how FFOs feel about planning for the future of their land and what actions, if any, have been taken with CBEP tools to maintain the future use of their land in forest (i.e., conservation easements, current use enrollment). We used descriptive analysis to take stock of owners' interests in keeping their land in forest use (i.e., no residential or commercial development) and intact (i.e., not parcelized) as well as owners' use of CBEP tools to control future land use. To address the second question, we used statistical models to assess the relationship between FFO legacy priorities and both revealed and stated preferences for designating future forest use. The statistical models describe the likelihood of making the decision/having the intention to control future use given focal legacy priorities (i.e., goals FFOs are trying to achieve when planning for the future of their land, intentions to keep land in forest use, and intentions to keep land intact).

Data and Methods

The study region includes forested areas within Massachusetts, Maine, New York, and Vermont. Approximately 73% of the area in these states is forested, with FFOs owning 46% of their 44 million acres of forest (Butler et al. 2016b, US Census Bureau 2010). We chose two areas in each state that maintain forest cover and parcel sizes 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 coming decades (Stein et al. 2005) (see Figure 1). These areas include the Lower Penobscot River and Saco watersheds in Maine; Millers and Westfield watersheds in Massachusetts; Cortland/Onondaga and Delaware/Greene counties in New York;[1] and Orleans and Rutland counties in Vermont[2].

Drawing from state and municipal agency property information, the sample frame includes landowners who own at least 10 acres of forested land. Ownerships of this size are better suited for economically viable forests (Hatcher et al. 2013), forest management, and other forestry-based programs (Butler et al. 2016a). We identified landowners (private individuals or families) from tax assessor data, collapsing multiple-property ownerships into one record and retaining the largest acreage. We stratified the sample to ensure that large parcels (i.e., greater than 40 acres) were represented in the sample and randomly selected landowners for participation from each stratum.

We designed a survey to gather information on intentions and decisions to designate future ownership and use, barriers to proceeding with goals, demographics, attitudes, and ownership and land characteristics. We administered the survey in 2016 using a modified Dillman tailored design method (Dillman et al. 2014). We sent a roughly equal number of surveys to both areas in each state, for a total of 2500 sent surveys (312 or 313 per study area, 625 per state).

Management and Policy Implications

Maintaining working forests and the many public benefits they provide requires both forest cover and parcels large enough to manage and support these benefits. We found that significant segments of family forest owners (FFOs) living in areas threatened by housing development want to keep their land in forest use and intact. Foresters stand in a critical position to help these FFOs reach these goals through conservation-based estate planning. A forester need not be an expert in estate planning to do this, but can use their role as a trusted source of information about the land to provide FFOs with encouragement to consider their options to keep their land undeveloped and undivided and to connect FFOs to resources and local estate planning professionals with experience with land. In addition, policies that encourage FFOs to develop formalized conservation-based estate plans, such as cost-share payments to work with estate planning professionals, tax credits for the cost of the estate plan, and educational programs, can support the goals of FFOs and efforts of foresters. Together, these interventions could help ensure the continuation of the forest benefits we rely on, as well as help FFOs reach their ownership goals while maintaining healthy family relationships.

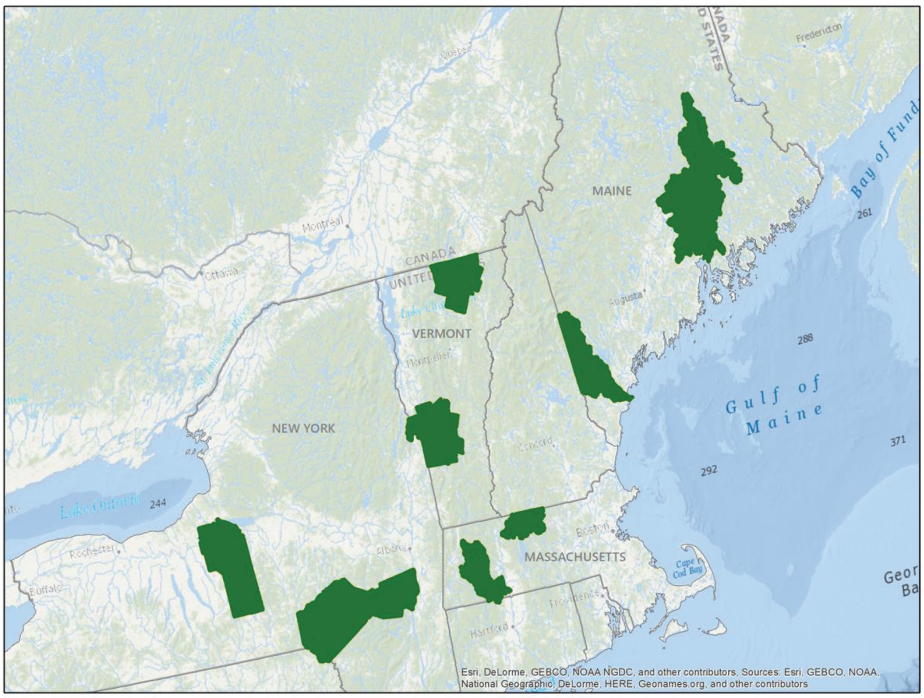

Figure 1. Study region chosen for analysis.

FFO Interest in Planning for the Future Use of Their Land

To document FFOs' interest in planning for the future use of their land, we used descriptive analysis to summarize FFO responses to several relevant survey questions. The survey asked FFOs to rate the importance of designating (i.e., controlling) the future use of their land, to indicate whether (and in what way) they have already taken action to control future use of their land, their intention for the future commercial or residential development of their land, their intention for subdividing their land in the future, and when they will take action to reach their legacy goals. We generated sample statistics summarizing these survey responses to take stock of variation in the importance of designating the future of their land generally; goals for keeping lands in forest use as well as lands intact; and timing of estate planning actions.

Legacy Priorities Affecting Preferences to Designate Future Use

We used two statistical models to assess both decisions and intentions to designate future land use. We estimated a binary model of the decision to designate or not (Decision Model) using the full sample of FFO respondents. We estimated a model of varying intentions to designate (Intentions Model) using a subsample of FFO respondents—those FFOs who *had not taken* any action to designate future use. We designed these related models to learn generally about owner actions to designate future use and more specifically about the intentions of owners that have not acted to date. For both models, we used the same set of explanatory variables, including multiple measures of our focal legacy priorities and variables controlling for other individual-specific factors (i.e., demographics, landowner characteristics).

We utilized the following three measures to reflect legacy priorities:

- Legacy goals: We constructed explanatory variables from survey questions asking recipients to rate the importance of several goals they may be trying to achieve with the future of their land (Table 1). We drew our methods from previous research that examined the influence of numerous attitudes and goals on behavior (Finley and Kittredge 2006). The seven resulting legacy goal items were subjected to a Principal Component Analysis (PCA) in order to aid interpretation and subsequent multivariate modeling by identifying underlying (latent) constructs of theoretical and practical interest. The PCA returned three components with eigenvalues greater than 1, which together explained 75% of the total variance across the seven items. Inspection of the scree plot and low cross-loadings confirmed a three-component solution. The first component reflected future owner goals (items related to providing

Table 1. Legacy goal questions and rotated principal components loadings by component.

	Legacy goal questions	Mean (std. dev.)[a]	Rotated factor loadings		
			Construct 1: Future owners	Construct 2: Altruistic	Construct 3: Financial
1.	That my land provides financial security for myself	2.76 (1.26)	–0.10	–0.01	**0.82**
2.	That my land provides financial security for my family/heirs	2.69 (1.28)	0.26	0.02	**0.56**
3.	That my land becomes an inheritance to family/heirs	3.14 (1.41)	**0.59**	0.04	–0.07
4.	To treat my family/heirs fairly	3.59 (1.31)	**0.57**	0.02	–0.06
5.	To ensure that future owners have the full range of options to use the land as they wish	3.20 (1.27)	**0.48**	–0.11	0.04
6.	That my land protects the environment and wildlife	3.99 (0.93)	0.07	**0.68**	–0.04
7.	That my land benefits my community	2.84 (1.19)	–0.06	**0.72**	0.04

[a]The Likert scale used for the legacy goal questions ranges from 1 to 5, where 1 is "Not at all important" and 5 is "Extremely important."

an inheritance, a fair outcome, or full range of options for future owners); Component 2 reflected altruistic goals (items related to benefits for the community, environment, or wildlife); and Component 3 reflected financial goals (items related to financial security for themselves or heirs) (Table 1). We constructed component scores for each of these three latent attitudinal variables related to future ownership goals, altruistic goals, and financial legacy goals, which were used in subsequent analyses as predictor variables.

- Intent to keep in forest use: We defined an FFO's intention to keep land in forest use based on how they answered the survey question about what they want to happen regarding future commercial or residential development of their land. Respondents were categorized as not allowing any new commercial or residential development on any amount of their land, allowing commercial or residential development on some portion of their land, or having no development goals.
- Intent to keep land intact: We defined an FFO's intention to keep land intact based on how they answered the survey question about what they want to happen regarding subdividing their land. Respondents were categorized as wanting their land to remain intact or most of it together as one property, willing to subdivide in any way or let the next owner decide what happens, or not having decided.

We relied on prior research (Table 2) when selecting the additional explanatory variables. We controlled for demographic characteristics (age, gender, education, income, retirement status, having children), ownership characteristics (whether the FFO inherited the land, number of legal owners, land tenure, and whether the FFO has a home on the land), number of acres owned, and attitudinal characteristics (whether the FFO cares what future generations think of them, whether the FFO wants to leave a positive mark on society, barriers to moving forward with planning for the future of the land, and the number of different types of information FFOs need to make decisions about the future of the land).

The Decision and Intentions models analyze systematic patterns between respondent choices and characteristics and describe the likelihood of making the decision/having the intention given a set of respondent characteristics (i.e., explanatory variables) (Ben-Akiva and Lerman 1991, Greene 2011). We modeled "yes" or "no" responses describing whether the respondent actually has made the decision to designate future use (Table 3) using a binary logit regression (Greene 2011). We modeled observed categorical responses reflecting gradations of intentions (Table 3) using an ordered logit regression (Greene 2011). These models are discussed in greater detail in the Supplementary Material text file.

Results

Mail Survey Results

Of the 2500 mailed surveys, 162 addresses were undeliverable and 636 surveys were returned, for a 27% cooperation rate. Response rate by study area was relatively consistent, with each study area contributing an average of 12.5% of the sample. The lowest response rates came from both study areas in Maine (10% each), and the highest response rates came from Millers, Massachusetts (16%), and Rutland, Vermont (15%). Of the 636 surveys, 552 were FFOs owning at least 10 acres of wooded land.

To assess non-response bias, first we compared the results of the survey with those of a related survey conducted in 2015 (Markowski-Lindsay et al. 2017). The 2015 survey used a different sample of respondents to measure the extent of formal estate planning but had the same sample design, sample frame, and no substantive evidence of bias (Markowski-Lindsay et al. 2017). Second, we compared selected survey responses within the current survey from early and late respondents. We identified early and late respondents by generating quartiles based on survey receipt date (unequal groups) and on observation number (equal groups). The results for

Table 2. Empirical studies examining private forest owner intentions or decisions regarding future land use disposition and controlled characteristics.

Study	Intention or decision measured	Characteristics explored
Mitani and Lindhjem (2015)	Intention: Participation in voluntary biodiversity conservation program	Acreage, age, education, gender, income, absentee, attitude toward conservation, reasons for owning
Ma and Kittredge (2011)	Intention: Likelihood of considering a conservation easement	Acreage, tenure, age, education, absentee, attitude toward forestland, reasons for owning
Majumdar et al. (2009)	Intention: Future intentions to subdivide, to deforest; no future plans; no activity	Acreage, tenure, age, education, gender, region, inheritor
Langpap (2004)	Intention: Participation in endangered species incentives that delay harvesting	Acreage, tenure, age, income, absentee, importance of forest-based services
Gruver et al. (2017)	Decision: Decision to subdivide, enroll in easements, or not plan for succession	Qualitative factors found: family relationships/communication (i.e., barriers), environmental motives, number of heirs
Creighton et al. (2016)	Decision: Transfer of family forests (successful or not)	Qualitative factors found: development pressure, regulatory uncertainty, financial instability, urban influences (i.e., barriers)
Ma et al. (2012)	Decision: Participation in a conservation easement program	Acreage, tenure, age, education, income, absentee, future intentions, location, reasons for owning
Farmer et al. (2011)	Decision: Participation in a conservation easement program	Motivations for participation (includes personal connection to the land and contributing to the public good [i.e., legacy motives])
Kauneckis and York (2009)	Decision: Participation in voluntary forest conservation program	Acreage, education
Mäntymaa et al. (2009)	Decision: Participation in fixed-term voluntary conservation program	Acreage, education, environmental preferences of owner, ownership motives
Markowski-Lindsay et al. (2017)	Decision: Having formal estate plans for land	Acreage, tenure, age, education, gender, absentee, barriers to progress, future intentions, location, ownership objectives, inherited, number of owners

Table 3. Models for analyzing preferences to designate/control future use.

Model	Survey question	Survey response	Sample percentage	Coding
Decision (binary logit)	Has respondent designated future use?	Will or trust designates future land use; or currently enrolled in current use tax program; or has a conservation easement or restriction on land	43%	1
		Has none of these	57%	0
Intentions (ordered logit)	How does respondent want to designate future use?	Does not want to designate future use	37%	0
		Undecided about designating future use	29%	1
		Yes: Wants to designate future use with conditions not binding to future owners	24%	2
		Yes: Wants to designate future use with conditions binding to future owners	11%[a]	3

[a]Intentions model percentages do not add up to 100% due to rounding.

both comparisons showed roughly comparable statistical differences, with *gender* and *having a will* indicating the greatest differences, with more males and will holders in the early respondent group. Based on this analysis, nonresponse bias appears low: no differences were found with respect to questions relevant to designating future use. Detailed results can be found in Table S1 of the Supplementary Materials.

FFO Interest in Planning for the Future Use of Their Land

Of the 552 surveys of FFOs owning more than 10 acres of wooded land, most (between 93% and 98%) answered the questions critical to understanding FFO interest in planning for the future use of their land (Table 4). Over 30% of respondents said that they will take action to reach their goals for their land in the next five years. Nearly 50% of respondents found it very important or extremely important to designate the future use of their land, with roughly 25% saying it was slightly or not important. Nearly 30% said they want to designate use with non-binding conditions, and 13% with binding conditions. Regarding keeping the land in forest use, nearly 50% of respondents did not have any development goals and over 30% did not want to allow any new commercial or residential development on their land. Only 3% of respondents intended to allow commercial or residential development on 25% or more of their land. Regarding keeping the forest intact, nearly 50% of respondents want their land to remain intact as a single property, 17% want to keep most together as one property, and 16% want the next owner to decide what happens. Only 11% of respondents were undecided about intentions for subdividing their land. The take-home messages of these results are summarized in Figure 2.

Table 4. Survey results of FFO interest in planning for the future use of their land.

Survey question	Percentage
When will you take action to reach your goals for your land? (n = 534)	46% "Satisfied with what I have done" 32% "In the next 5 years" 6% "In the next 10 years" 2% "In the next 20 years" 14% "I don't know"
Decision:	
Will: Has one that controls land use (n = 526)	10% "Yes"; 65% "No"; 25% "Don't have a will"
Trust: Has one that controls land use (n = 527)	5% "Yes"; 17% "No"; 78% "Don't have a trust"
Current use program (n = 539)	36% "Enrolled"; 59% "Not enrolled"; 5% "Don't know"
Conservation easement or restriction (n = 542)	15% "Yes"; 82% "No"; 3% "Doesn't know if has one"
Intention:	
Controlling use: How important is it for you to designate future use of your land? (n = 537)	46% "Extremely or very important" 28% "Moderately important" 26% "Slightly or not important"
How does respondent want to designate future use? (n = 514)	31% "Does not want to" 27% "Undecided 29% "Yes: non-binding conditions" 13% "Yes: binding conditions"
Keep in forest use: What do you want to happen regarding the future commercial or residential development of your land (n = 520)	34% "Don't allow any new commercial or residential development on my land" 15% "Allow commercial or residential development on <25% of my land" 3% "Allow commercial or residential development on 25% or more of my land" 48% "No development goals"
Keep forest intact: What do you want to happen regarding subdividing your land? (n = 534)	49% "Remain intact as a single property" 17% "Keep most together as one property" 7% "Subdivide in any way is fine with me" 16% "Next owner should decide what happens" 11% "Undecided"

Figure 2. Family forest owner interest in planning for the future of their land.

Survey results indicated that between 5% and 36% of the respondents used at least one of the four tools that serve to designate the future use of their land: will, trust, current use program enrollment, or a conservation easement/restriction. Because some respondents may use more than one tool at a time, the percentages for each tool cannot be combined. The highest percentage of FFOs (36%) have enrolled their land in a current use program, thereby protecting their land from development for the period of time associated with the program in their state. Conservation easements/restrictions are held by 15% of respondent FFOs. Approximately 10% of respondents say that their will communicates their desire for the future use of the land, although unenforceable. At 5%, trusts reflect the tool used least by respondents (Table 4).

Legacy Priorities Affecting Preferences to Designate Future Use

Of the 552 FFO respondents who own at least 10 acres of wooded land, 284 provided enough information to be included in the Decision Model. The reduction in the sample size for the analysis is due to item non-response, which is not unexpected given the delicate nature of the subject matter. Approximately 43% (n = 121) of respondents made formal plans to control use with either a will, trust, conservation easement/restriction, or current use tax program enrollment (Table 3).[3]

The sample for the Intentions Model reflects a subset of the 284 individuals from the Decision Model—those who had not taken action to designate the future use of their land: 161 respondents. While 163 of the 284 respondents did not take action to designate the future use of their land, two of those individuals did not indicate their intention for the future and were therefore excluded from the Intentions Model. Approximately 35% of respondents said they would like to designate future use of their land in some way (Table 3).

T-tests and Pearson's chi-square tests indicated that differences between those who have and have not already designated use differ significantly in several dimensions (Table 5). On average, those who have designated use are older than those who have not (67 vs. 63 years old); and reflect a population with more retirees (54% vs. 44%), more who have inherited their land (28% vs. 14%), greater ownership acreages (99 vs. 45 acres) (converted from mean logarithm statistics), fewer reported difficulties regarding making estate plans for their land (1.6 vs. 1.9), and greater intent to not allow any new development (46% vs. 23%) and to designate future use (57% vs. 35%). In addition, individuals who designated use demonstrated higher scores on the composite measure of altruistic goals than did people who have not (0.34 vs. –0.17).

Overall, both logit models (Decision and Intentions) performed well based on χ^2, AIC, and pseudo-R^2 results (see Table S2, Supplementary Materials). We tested for multicollinearity among potential explanatory variables using "Variance Inflation Factor" (VIF) diagnostics; VIF tolerance levels below 0.4 are associated with high multicollinearity (Allison 1999). The lowest level for variables in this analysis was 0.44 (age), and the mean was 0.64.

Decision to Designate Future Use. Legacy priorities are significantly correlated with the decision to designate future use. Specifically, having legacy goals that are altruistic increases the likelihood of having designated future use of the land, while having legacy goals that concern finances decreases the likelihood of having made this decision. Compared to owners who want to allow future commercial and residential development on their property, owners who do not want to allow development on their land were more likely to have made the decision to designate future use. In addition, owners who were more likely to have abstained from designating future use want it to remain as a single property or keep most together (versus subdividing their land in any way).

The results of other explanatory variables indicate that the greater the acreage owned, the greater the likelihood of having made the decision to designate future use of the land. Further, those who indicated more barriers to making future plans for the land were less likely to have acted to designate future use.

Table 6 summarizes the results that show significance; Table S2 (Supplementary Materials) presents detailed regression results of all variables included.

Intentions to Designate Future Use. Legacy priorities are significantly correlated with the varying intentions to designate future land use *of owners who have not taken actions to designate future use*. Specifically, having legacy goals that concern future owners decreases the likelihood of wanting to designate future use of the land, and having legacy goals that are altruistic increases the likelihood of wanting to designate future use of the land. Wanting to keep the land in forest use has a significant impact on intentions to designate future use. Those who do not have any specific future residential or commercial development goals were less likely to want to designate future use than those who do want to allow this type

Table 5. Explanatory variable definitions and sample statistics for regression models[a].

Variable	Has designated future use[b] (n = 121)	Has not designated future use (n = 161)[c]	Definition
Legacy priorities			
Legacy goal: Future owners	0.12 (1.6)	–0.01 (1.4)	PCA: land becomes inheritance to family/heirs; treat family/heirs fairly; ensure future owners have full range of options to use land as they wish
Legacy goal: Altruistic***[d]	0.34 (1.2)	–0.17 (1.1)	PCA: land protects environment & wildlife; land benefits my community
Legacy goal: Financial	–0.14 (1.1)	0.07 (1.2)	PCA: land provides financial security for myself; for my family/heirs
Keep forest in forest use	38.8%	57.1%	No development goals
(Development intent)***[d]	15.7%	20.5%	Allow development
	45.5%	22.4%	Don't allow any new development
Keep forest intact (Subdividing	71.1%	64.0%	Remain intact/keep most together
intent)	20.7%	25.5%	Subdivide in any way/let next owner decide
	8.3%	10.6%	Have not decided
Other explanatory variables	67.3 (11.4)	62.7 (11.7)	Age of respondent
Age***[d]	21.5%	28.6%	Female=1
Gender	66.1%	60.3%	Received 2-year university degree or higher; Yes=1
College degree	62.0%	60.2%	Earns greater than median household income; Yes=1
Household annual income	53.7%	43.5%	Yes=1
Retired*[d]	86.0%	84.5%	Yes=1
Has children	28.1%	13.7%	Inherited the land, Yes=1
Inherited***[d]	83.5%	88.8%	1 or 2 owners (coded as 0)
Number of legal owners	4.1%	3.1%	3 owners (coded as 1)
	7.4%	4.4%	4 owners (coded as 2)
	0.8%	1.9%	5 owners (coded as 3)
	1.7%	0.0%	6 owners (coded as 4)
	0.8%	0.6%	7 owners (coded as 5)
	0.0%	1.2%	8 owners (coded as 6)
	0.8%	0.0%	10 owners (coded as 8)
	0.8%	0.0%	11 owners (coded as 9)
Tenure	27.9 (15.6)	26.3 (14.7)	Number of years owned
Home	52.1%	54.7%	Primary residence is on the land; Yes=1
Acreage***[d]	4.6 (0.9)	3.8 (0.8)	Ln(acres) of total land owned
Care what future generations think	5.0%	8.1%	Strongly disagree
of me	4.1%	5.0%	Disagree
	30.6%	37.3%	Neutral
	45.5%	39.8%	Agree
	14.9%	9.9%	Strongly agree
Important for me to leave a positive	0.8%	2.5%	Strongly disagree
mark on society*[d]	0.8%	2.5%	Disagree
	19.8%	29.8%	Neutral
	52.1%	47.8%	Agree
	26.5%	17.4%	Strongly agree
Barriers**[d]	1.6 (1.2)	2.0 (1.5)	Number of difficulties faced regarding making plans
Information needs	1.7 (1.8)	2.0 (2.2)	Total number of information sources needed to make decision about future of land
Intentions question			
How I want to designate the future	24.2%	36.7%	Don't want to designate future use
use of the land ***[d]	18.3%	28.6%	Undecided
	36.7%	24.2%	Yes: non-binding conditions
	20.8%	10.6%	Yes: binding conditions

[a]Sample statistics: mean (standard deviation) for continuous variables; frequency for categorical variables.
[b]Respondents are coded as having made the decision to designate future use if landowner has a will or trust that controls use, an easement, or is currently enrolled in a current use tax plan.
[c]These statistics reflect the Intentions Model sample, which excludes two individuals who did not make plans and failed to provide an answer to the "intent to designate future use" question.
[d]Samples are significantly different if marked with the following p-values: <=10%*, <=5%**, <=1%***. If not indicated, statistics are not statistically different across the two samples.

of development. Those who want to keep their land intact or most together were not significantly different from those who want to subdivide in any way in the context of intending to designate future use. Wanting to keep the forest intact did not significantly affect intentions to designate future use.

As described above, those who have already designated future use of their land are older than those who have not designated future use. However, the Intentions Model indicates that *of all those who have not yet designated future use,* those with stronger intentions tend to be younger than those with no intention to designate future use. In addition, owners with children and absentee landowners are less likely to have stronger intentions to designate future use.

Table 6 summarizes the results that show significance; Table S2 (Supplementary Materials) presents detailed regression results of all variables included.

Discussion

In this article, we sought to better understand legacy planning characteristics of the largest forest ownership type in the eastern United

Table 6. Summary of regression models of factors affecting preferences to designate future use.

Factor	Decision Model: Took steps to designate/ control future use	Intentions Model: Wants to designate/ control future use
Legacy priorities		
Legacy goal: Future owners	n/s[a]	↓ less likely
Legacy goal: Altruistic	↑more likely	↑more likely
Legacy goal: Financial	↓ less likely	n/s
Keep in forest use (base: allow development)		
Development: no specific goals[b]	n/s	↓ less likely
Development: don't allow it[b]	↑more likely	n/s
Keep forest intact (base: subdivide any way)		
Keep intact/most together[c]	↓ less likely	n/s
Other explanatory variables		
Older respondents	n/s	↓ less likely
Has children	n/s	↓ less likely
Home on land	n/s	↑more likely
Greater acreage owned	↑more likely	n/s
Had more barriers to making plans	↓ less likely	n/s

[a]n/s: variable is insignificant.
[b]"Keep in forest use" question is relative to "allowing development."
[c]"Keep forest intact" question is relative to "subdividing in any way."

States so that the professional forest community may be able to assist the FFOs who want to keep forest in forest use and intact. Having a better grasp of the extent of the interest in planning for the future of the land and how legacy priorities may shape estate planning for FFOs are useful findings for informing FFOs on how best to utilize CBEP tools.

Over the next five years, approximately one-third of respondents told us they will be making decisions about the future of their land. Sample statistics show that many FFOs who live in areas predicted to experience medium and high forest conversion in the coming decades have a strong interest in controlling the use of their land, maintaining forest cover, and keeping the forest intact. Almost half of the respondents rate controlling the future use of their land as "extremely or very important." Furthermore, between one-half and two-thirds of respondents are open to taking formal CBEP steps to keep most or all of their land in forest or intact. Interestingly, these percentages are not far from those that have been suggested as necessary to reach collective conservation goals (Wilson 2016, Foster et al. 2017). This finding suggests a tremendous opportunity for natural resource professionals and policymakers to help inform landowner decisions and move landowners from intention to action on a critical issue with substantial influence on the future of our forested landscapes. In addition, while 34% do not want to see any commercial or residential development of their land, nearly 50% of respondents report being undecided about development decisions, and nearly 50% report wanting the land to remain intact as a single property. These outcomes suggest that there are opportunities to provide options to FFOs that may influence them to pass their land on to the next owner in forest use and intact.

Each landowner's decision is a unique and multidimensional process involving economic, social, biophysical, and cultural factors (Gruver et al. 2017). We found that 13% of respondent FFOs want to control use using binding conditions while 29% want to do so using non-binding conditions. In order to ensure a stable future land base of forest cover in parcels big enough for active forest management and other public and private benefits, we must be able to offer this diverse set of FFOs an equally diverse set of conservation-based estate tools ranging from permanent to temporary and formal legal structures to simple formal documentation.

Understanding the legacy priorities of landowners can help craft effective policy interventions geared toward keeping their land in forest use and intact and can help foresters and other forest professionals package CBEP tools and policy in ways that are most helpful to landowners. We found that FFOs have distinct legacy goals related to providing an inheritance, a fair outcome, or a full range of options for future owners/heirs; altruistic benefits for the community, environment, or wildlife; and financial security for themselves or heirs. These legacy goals influence decisions and intentions to control future use, as do FFO desires to keep forested land in forest and intact.

FFOs with altruistic goals and those who do not want to allow any commercial or residential development on their land were more likely to have made the decision to control future use. Education and outreach about permanent CBEP options for controlling land use (e.g., conservation easements) may be most appropriate for these owners. Owners with financial goals were less likely to have made the decision. Perhaps not taking action indicates that these FFOs want to keep their options open. Legal tools that allow flexibility in the use of the land may be most appropriate for this segment (e.g., trust, LLC). FFOs who wanted to keep their land mostly intact were also less likely to have made the decision to control future use. Educating these FFOs about the nature of various CBEP tools and the importance of planning could help them reach the goals for their land.

Similar to the Decision Model results, FFOs *who have not yet acted* and have altruistic goals for their land are more likely to want to control future use, and educating them about permanent CBEP options, perhaps, could help move them from intention to action. FFOs with future owner/heir-based goals or those with no specific development goals for their land are less likely to want to control use. Perhaps this result derives from the desire to allow the next owners options for the land. Educating these FFOs about the importance of estate planning and non-binding CBEP options for controlling land use (e.g., current use taxation programs) may be most appropriate for helping these owners move toward action to plan the future of their land.

Knowing the legacy priorities of the landowner helps select the most appropriate combination of CBEP tools to meet the FFO's goals. Importantly, there are creative CBEP solutions beyond traditional forestry cost-share programs and permanent conservation easements that could use a combination of estate planning tools to meet the varied needs of owners. These combinations of CBEP tools allow the diversity of landowners to craft individual solutions while passing land on in forest use and intact. This study helps provide greater insight into these needs.

Just as CBEP tools can also be used in varied combinations to meet FFO goals, conservation organizations can use these tools differently across landscapes. For example, a conservation organization may encourage permanent tools (e.g., conservation easements) in areas of high ecological value (e.g., public water supply, endangered species habitat) to maximize limited time, energy, and resources for greatest impact while focusing on non-permanent CBEP tools (e.g., current use tax programs, trust, LLC) in supporting landscapes near high-value resources.

Conclusions

Keeping forests in forest use and intact is foundational to the many public and private benefits that are derived from these forests. Our study demonstrates a desire by a plurality of landowners to leave a legacy of maintained forest cover and undivided parcels. While much of the effort of foresters is focused on engaging unengaged landowners and moving engaged landowners to increased stewardship action, if not enough of the forest base is stabilized, foresters will lose management opportunities and the public will lose many benefits. It is like fiddling while Rome burns (see Kittredge [2009] for an essay on the importance of focusing resources on addressing forest conversion). CBEP provides a formal plan for the future of FFO land and helps FFOs reach their personal and financial goals. Pairing CBEP with silvicultural and stewardship practices also ensures that these actions will reach their full benefit. For those who have completed actions to control future use, CBEP tools can be a way to refine their goals. For those who have the intention to control future use but have not yet engaged in the process, CBEP tools could be used to help them go from intention to action. Meeting the goals of FFOs to keep land in forest use and intact and society's needs for the benefits of forests means incorporating CBEP into the day-to-day work of foresters with the support of strategic, research-based policies. Future work that more consistently gathers information on legacy priorities; focuses on the inter-family dynamics of legacy decisions and the influence of social networks in informing or influencing these decisions; and investigates spatial patterns of these decisions are important next steps to moving our understanding of these legacy planning decisions forward.

Supplementary Materials

Supplement 1. Detailed description of quantitative methods used for classification of harvest events.

Endnotes

1. The watersheds in New York covered a wide geographic area, so the sample frame focused on two counties within each watershed.
2. The counties in Vermont are used instead of watersheds because they represent a land area roughly equivalent to the sample frame of other states and they reflect multiple watersheds considered to be threatened by increases to housing density (Stein et al. 2005).
3. This statistic does not match percentages provided in Table 4 because this statistic stems from the smaller sample used for the logit model analysis and the tools in Table 4 are not mutually exclusive—the 43% does not double-count individuals who may use more than one tool.

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