INFLUENCE AND EFFECTIVENESS OF FINANCIAL INCENTIVE PROGRAMS IN PROMOTING SUSTAINABLE FORESTRY IN THE SOUTH

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Abstract

Selected state agency foresters in each of the 13 southern states were surveyed about the financial incentive programs available to nonindustrial private forest owners. The foresters were asked to name and describe the public and private programs available in their state, to assess forest owners' awareness of each program, its appeal among the owners aware of it, its effectiveness in encouraging sustainable forestry and enabling owners to meet their objectives, and the percent of program practices that remain in place and enrolled acres that remain in forest over time. They also were asked to suggest ways to improve the programs. The Forest Stewardship, Forest Land Enhancement, and Forest Legacy Programs were among the top rated federal programs, scoring well for all measures and attributes. Programs sponsored by states and private organizations tended to be more narrowly targeted than federal programs, and scored well for specific attributes. The foresters' suggestions for program improvement centered largely on improving program visibility and availability, increasing and ensuring long-term consistency in program funding, and simplifying the application and approval process.

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Introduction

Policy tools such as education, technical assistance, regulation, and financial incentives influence the management and use of nonindustrial private forests. Increasing concern over loss of open space, forest fragmentation, and the impact of globalization of forest product markets has revived interest in financial incentives as tools to conserve forests and promote sustainable forestry (Sampson and DeCoster 2000; Wear and Greis 2002; Hutton and Leader-Williams 2003). The scope of financial incentives is extensive and dispersed among numerous organizations. Most popular are cost-share programs for forest management practices and tax incentives. Most cost-share programs are funded by the federal government and administered by state forestry agencies. Both the federal and state governments provide tax incentives, the federal government primarily through provisions in the federal income tax, and states primarily through provisions in state property taxes. In some states, forest industry firms, state forestry associations, and non-governmental organizations also provide forestry-related incentive programs (Greene et al. 2005).

Financial incentives were first used in the 1940s to address policy concerns about timber supply. Since that time, however, the focus of most financial incentive programs has shifted toward forest sustainability issues, including forest stewardship, environmental services, and preservation of natural capital. Sustainable forestry – defined as managing forests for their ecological, economic, and social benefits such that those benefits do not diminish in quantity or quality over time (USDA Forest Service 2004) – has become the linchpin of the current forest policy agenda (Oliver 2003; Wear et al. 2007).

Extending from Virginia to Texas, the 13 states of the U.S. South provide an ideal site to study the effectiveness of financial incentive programs in encouraging sustainable forestry on nonindustrial private forests. The region is home to 33 percent of the nation's population and 42 percent of its more than 10 million nonindustrial private forest owners. It comprises 29 percent of U.S. forestland and 40 percent of commercial timberland (Butler and Leatherberry 2004). Moreover, 88 percent of forestland in the region is privately owned, compared with 57 percent nationwide (Smith et al. 2004).

This paper presents results for the South from a study to assess the effectiveness of currently available public and private financial incentive programs in encouraging sustainable forestry on nonindustrial private land. The study was nested within larger study to identify financial incentive programs with the potential to enhance the practice of sustainable forestry on nonindustrial private land (Greene et al. 2005; Kilgore et al. 2007; Straka et al. 2007).

Methods and Data

Data for the study were collected using a mail survey of state agency foresters in each of the 13 southern states selected for their overall knowledge of financial incentive programs. The appropriate individual in each state to receive the survey questionnaire was identified using a

networking approach; in most cases it was the person who managed the Forest Stewardship Program.

The survey questionnaire asked the foresters to name and describe the public and private financial incentive programs available to nonindustrial private forest owners in their state, as well as any private programs in neighboring states that they were aware of. In follow-up questions they were asked to use a 4-point Likert scale to assess forest owners' awareness of each program, its overall appeal among the owners aware of it, and its effectiveness in encouraging sustainable forestry and enabling owners to meet their objectives of forest ownership. The foresters also were asked to estimate the percent of program practices that remained in place and enrolled acres that remained in forest over time, and to suggest ways to improve owner participation in the program and its administrative effectiveness.

Nine federal incentive programs were surveyed: the Forest Stewardship Program (FSP), Conservation Reserve Program (CRP), Environmental Quality Incentives Program (EQIP), Forest Land Enhancement Program (FLEP), Forest Legacy Program (FLP), Landowner Incentive Program (LIP), Southern Pine Beetle Prevention and Restoration Program (SPBPR), Wetlands Reserve Program (WRP), and Wildlife Habitat Incentives Program (WHIP). Table 1 provides information about each program, including the year it was established, a summary of its provisions, and its administering agency or agencies.

Three types of non-federal financial incentive programs also were surveyed: state preferential property tax programs for forest land, other state-sponsored financial incentive programs, and privately-sponsored financial incentive programs. Every state in the region provides preferential property tax treatment for forest land. Each state takes its own unique approach, however, and even similar provisions are applied in widely divergent ways. Some states also sponsor other types of financial incentives, which typically are financed by forest tax revenues. Some are cost-share programs to fund timber management practices, while others focus on wildlife, riparian areas, or conservation easements. Forest industry firms account for the majority of financial incentives offered by private entities, although programs sponsored by state forestry associations, land trusts, or conservation organizations are available in a handful of states.

The survey questionnaire was developed, pre-tested with state agency foresters in each of the co-authors' home states, and refined using their feedback. The completed questionnaire was mailed out in March 2005, using the Dillman (1999) Tailored Design Method. Although the questionnaire was extensive – 89 questions on 30 pages – follow-up telephone calls and e-mails provided a 100 percent useable response. Numerical data, including the Likert scale ratings, were compiled and summarized. Tukey tests were used to identify statistically significant differences between program ratings for specific attributes. Forester comments and suggestions were compiled and categorized. The results of the analysis are summarized below.

Table 1. Federal financial incentive programs surveyed

Forest Stewardship Program (FSP) – Established in 1990 to assist private forest owners to keep forest land and resources in healthy condition and increase the economic and environmental benefits it provides. FSP is not a cost-share program; participating owners receive technical assistance to develop a Forest Stewardship plan, and must make a good faith effort to implement the plan. Administered by the USDA Forest Service.

Conservation Reserve Program (CRP) – Established in 1985 to promote conversion of highly erodible farmland and other environmentally sensitive land to a long-term resource conserving cover. Participating landowners receive annual payments for 10–15 years based on the converted land's agricultural rental value. They also can receive a cost-share of up to 50 percent of the cost of establishing the resource conserving cover. Administered by the USDA Farm Service Agency.

Environmental Quality Incentives Program (EQIP) – Established in 1996, EQIP combines features of four earlier programs. Its objective is to help farm and ranch owners address practices that pose a significant threat to soil or water resources. Participating owners receive technical assistance, cost-share, and incentive payments to implement conservation practices. Administered cooperatively by the USDA Natural Resources Conservation Service and Farm Service Agency.

Forest Land Enhancement Program (FLEP) – Established in 2002, FLEP combines two earlier programs. It promotes sustainable management of nonindustrial private forest land by providing technical, educational, and cost-share assistance to owners. A coordinating committee in each state determines how program funds will be used. Owners must have a written forest management plan to participate. Administered by the USDA Forest Service in partnership with state forestry agencies.

Forest Legacy Program (FLP) – Created in 1990 protect environmentally important private forest land threatened with conversion to nonforest uses. FLP operates primarily through the purchase of permanent conservation easements. Up to 75 percent of the total cost of protecting forest land can be federally funded. Administered by the USDA Forest Service in partnership with individual states.

Landowner Incentive Program (LIP) – Established in 2003 to help private landowners protect and restore habitat for at-risk plant and animal species. LIP provides funding for states to offer technical assistance and grants to participating owners to develop and implement habitat management plans. Administered by the USDI Fish and Wildlife Service in cooperation with state wildlife agencies. To participate, the states must provide a minimum 25 percent non-federal match for federal funding.

Southern Pine Beetle Prevention and Restoration Program (SPBPR) – Established in 2003, a coordinated program to help public and private landowners in southern states reduce the susceptibility of their forests to SPB attack and restore affected areas, and to fund research. Private landowners who participate receive educational assistance and cost-share payments to implement treatments such as thinning and hazard fuel reduction. Administered by the USDA Forest Service.

Wetlands Reserve Program (WRP) – Established in 1985 to encourage conservation of wetlands on privately owned land. Participating owners receive financial assistance to implement practices. All costs are reimbursed if the owner accepts a permanent easement; 75 percent of costs are reimbursed if the owner opts for a 30-year easement or cost-share agreement. Administered cooperatively by the USDA Natural Resources Conservation Service and Farm Service Agency.

The Wildlife Habitat Incentives Program (WHIP) – Established in 1996 to encourage the development and improvement of wildlife habitat on private land. Participating owners receive technical assistance to develop a wildlife habitat management plan, plus cost-share payments under an agreement lasting 5–10 years. Cost-shares cannot exceed 75 percent of the cost of the practices performed. Administered by the USDA Natural Resources Conservation Service.

Results

Program Catalog

The first result of the survey was a catalog of the public and private financial incentive programs available to nonindustrial private forest owners in each state. An examination of the catalog reveals that the full suite of federal incentive programs is more likely to be available in states in the South than in other regions. At the time of the survey, FSP, CRP, EQIP, FLEP and WHIP were available in all 13 southern states, FLP and WRP in 12 states, SPBPR in 10 states – and nowhere else in the U.S. – and LIP in 8 states. The number and variety of the state- and privately-sponsored financial assistance programs available to forest owners was greater in the South than in other regions. As well, states in the region hosted one of only two financial incentive programs sponsored by forestry associations and one of only two programs sponsored by non-governmental organizations (Greene et al. 2006).

Federal Programs

None of the foresters surveyed responded about LIP. This may be because that the program was relatively new at the time of the survey and is administered by an agency outside the U.S. Department of Agriculture. Because of this result, LIP was excluded from the analysis.

Table 2 summarizes the results for federal financial incentive programs as given by the state agency foresters. The first section of the table shows the foresters' mean rankings for forest owner awareness of each program, and its overall appeal among the owners aware of it. All eight programs scored in the middle ranges for both awareness and appeal, with appeal rated higher than awareness. FLEP scored highest in owner appeal, followed closely by CRP and FSP. The same three programs also scored highest in owner awareness, although the difference was not statistically significant (Table 2, Part a).

Part b of Table 2 summarizes the foresters' mean rankings for the programs in terms of their effectiveness in encouraging sustainable forestry among participating owners. FLP ranked highest overall, scoring well in all attributes of sustainability. CRP, FSP, and FLEP ranked next-highest. Compared with other programs, CRP scored particularly well for protecting soil productivity, protecting water quality, preventing conversion of forest land, and protecting wildlife and fish. By the same measure, FSP scored well for protecting water quality, encouraging forest management, and protecting wildlife and fish, while FLEP scored well for encouraging forest management and protecting wildlife and fish.

While WRP ranked third-highest, it is still solidly in the effective range. Compared with other programs, WRP scored among the highest for protecting water quality and protecting wildlife and fish; it scored lowest for encouraging forest management. WHIP, EQIP, and SPBPR ranked lowest in encouraging sustainable management. WHIP, however, scored quite well for protecting wildlife and fish, EQIP for protecting water quality and wildlife and fish, and SPBPR for encouraging forest management.

Table 2. Federal forestry incentive program attributes as reported by state program administrators

	Incentive Program							
Attribute	**FSP**	**CRP**	**EQIP**	**FLEP**	**FLP**	**SPBPR**	**WRP**	**WHIP**
a. Owner awareness and appeal								
Awareness [1,2]	2.69 [A]	2.62 [A]	2.40 [A]	2.58 [A]	1.89 [A]	2.00 [A]	1.75 [A]	2.14 [A]
Appeal [1,2]	3.31 [AB]	3.38 [AB]	2.50 [AB]	3.50 [A]	3.00 [AB]	2.75 [AB]	2.13 [B]	2.86 [AB]
b. Effectiveness in encouraging sustainable forestry								
Prevents conversion [1,2]	3.00 [ABC]	3.70 [A]	2.11 [C]	3.36 [AB]	3.89 [A]	2.83 [ABC]	3.00 [AB]	2.50 [BC]
Prevents parcelization [1,2]	2.85 [ABC]	3.27 [ABC]	2.11 [C]	3.18 [ABC]	3.89 [A]	2.67 [BC]	3.38 [AB]	2.50 [BC]
Maintains forest type [1,2]	3.00 [AB]	3.40 [AB]	2.40 [B]	3.27 [AB]	3.63 [A]	2.60 [AB]	3.25 [AB]	2.71 [AB]
Protects wildlife/fish [1,2]	3.77 [A]	3.31 [A]	3.30 [A]	3.36 [A]	3.67 [A]	2.17 [B]	3.38 [A]	3.86 [A]
Protects water quality [1,2]	3.92 [A]	3.77 [A]	3.70 [A]	3.36 [AB]	3.78 [A]	2.57 [B]	3.50 [A]	3.29 [AB]
Protects soil productivity [1,2]	3.54 [AB]	3.92 [A]	3.50 [AB]	3.45 [AB]	3.78 [A]	2.43 [C]	3.25 [ABC]	2.86 [BC]
Encourages forest management [1,2]	3.85 [A]	3.46 [ABC]	2.50 [CD]	3.91 [A]	3.56 [AB]	3.57 [AB]	2.25 [D]	2.71 [BCD]
Overall average	3.42 [AB]	3.44 [AB]	2.82 [CD]	3.42 [AB]	3.74 [A]	2.70 [D]	3.14 [BC]	2.92 [CD]
c. Effectiveness in helping owners meet their objectives								
Timber production [1,2]	3.54 [A]	3.00 [AB]	2.30 [BC]	3.82 [A]	3.13 [AB]	3.57 [A]	2.38 [AB]	1.86 [C]
Recreation [1,2]	3.23 [A]	2.67 [A]	2.30 [A]	3.00 [A]	3.25 [A]	2.17 [A]	2.75 [A]	3.29 [A]
Wildlife [1,2]	3.69 [A]	3.31 [A]	3.20 [AB]	3.55 [A]	3.50 [A]	2.43 [B]	3.38 [A]	4.00 [A]
Aesthetics [1,2]	3.38 [AB]	2.69 [AB]	2.70 [AB]	2.91 [AB]	3.50 [A]	2.43 [B]	3.00 [AB]	3.14 [AB]
Soil/water conservation [1,2]	3.38 [AB]	3.92 [A]	3.50 [AB]	3.64 [A]	3.75 [A]	2.86 [B]	3.25 [AB]	2.86 [B]
Invasive species control [1,2]	2.62 [A]	2.50 [A]	3.10 [A]	2.91 [A]	3.00 [A]	2.67 [A]	2.00 [A]	2.71 [A]
Overall average	3.31 [AB]	3.11 [ABC]	2.85 [BC]	3.30 [AB]	3.36 [A]	2.70 [C]	2.80 [C]	2.98 [ABC]
d. Over time								
Practices remain in place [1,2]	3.38 [A]	3.69 [A]	3.50 [A]	3.50 [A]	3.89 [A]	3.71 [A]	3.63 [A]	3.17 [A]
Acres remain in forest [1,2]	3.54 [A]	3.46 [A]	3.00 [A]	3.50 [A]	3.89 [A]	3.71 [A]	3.63 [A]	3.00 [A]

[1] Likert Scale ratings: 1 = Very ineffective, 2 = Moderately ineffective, 3 = Moderately effective, 4 = Very effective.
[2]Tukey's grouping across incentive programs for each respective program attribute. Alpha = 0.05. Means with the same letter are not significantly different.

Part c of Table 2 summarizes the foresters' mean rankings for the programs in terms of their effectiveness in helping nonindustrial private forest owners meet their objectives of forest ownership. Generally, the foresters scored the programs less effective in this area than in encouraging sustainable forestry. It should be noted that four programs scored in the moderately ineffective range for helping owners meet objectives related to recreation, and six scored in the moderately ineffective range for helping owners meet objectives related to invasive species control.

FLP again ranked highest overall, scoring well for all owner objectives. FSP and FLEP ranked next-highest. Compared with other programs, FSP scored particularly well for objectives related to wildlife, timber production, and recreation, while FLEP scored well for objectives related to timber production, soil and water conservation, wildlife, and recreation.

When grouped, CRP, WHIP and EQIP ranked third-highest overall. Compared with other programs, CRP scored well for objectives related to soil and water conservation and wildlife, but averaged in the moderately ineffective range for aesthetics, recreation, and invasive species control. WHIP received the highest possible score for owner objectives related to wildlife, but averaged moderately ineffective for soil and water conservation, invasive species control, and timber production. EQIP received high marks for objectives related to soil and water conservation, but averaged moderately ineffective for aesthetics, timber production, and recreation. WRP and SPBPR ranked lowest for helping forest owners meet their objectives. WRP, however, received solid scores for helping owners meet objectives related to wildlife, and SPBPR for timber production.

The final section of Table 2 (Part d) summarizes the foresters' mean rankings for program practices remaining in place and enrolled acres remaining in forest over time. All eight federal programs scored in the moderately to very effective range for these characteristics, with no statistically significant differences between the scores.

Other incentive programs

Table 3 summarizes the results for state and private financial incentive programs as given by the state agency foresters. The questionnaire sections relating to private incentive programs were streamlined to request only descriptions of the programs and ratings for their effectiveness in encouraging sustainable forestry and helping owners meet their objectives of forest ownership. No data were collected for owner awareness and appeal, or for practices remaining in place and acres remaining in forest over time.

The first section (Part a) of Table 3 shows the state agency foresters' mean rankings for forest owner awareness of each type of program, and its overall appeal among the owners aware of it. For owner awareness, state property tax and incentive programs rated higher, in general, than federal programs; for owner appeal, they rated about on a par.

Table 3. State- and privately-sponsored forestry incentive program attributes as reported by state program administrators

Attribute	Incentive Program			
	State Property Tax Programs	Other State Incentive Programs	Industry & State Assoc. Programs	Nongov'tal Organization Programs
a. Owner awareness and appeal				
Awareness [1,2]	3.00 [A]	2.70 [A]	N/A	N/A
Appeal [1,2]	3.25 [A]	3.14 [A]	N/A	N/A
b. Effectiveness in encouraging sustainable management				
Prevents conversion [1,2]	3.08 [A]	3.71 [A]	3.00 [A]	2.66 [A]
Prevents parcelization [1,2]	2.91 [A]	3.28 [A]	2.87 [A]	3.00 [A]
Maintains forest type [1,2]	3.00 [A]	3.28 [A]	3.14 [A]	3.33 [A]
Protects wildlife/fish [1,2]	2.81 [A]	3.14 [A]	2.50 [A]	3.33 [A]
Protects water quality [1,2]	3.00 [A]	3.42 [A]	3.12 [A]	3.33 [A]
Protects soil productivity [1,2]	2.83 [A]	3.43 [A]	2.87 [A]	3.33 [A]
Encourages forest management [1,2] ...	2.91 [A]	3.71 [A]	3.25 [A]	3.00 [A]
Overall average [1,2]	2.94 [B]	3.43 [A]	2.96 [B]	3.14 [AB]
c. Effectiveness in helping owners meet their objectives				
Timber production [1,2]	3.08 [A]	3.85 [A]	3.86 [A]	3.00 [A]
Recreation [1,2]	2.72 [A]	3.00 [A]	2.37 [A]	3.33 [A]
Wildlife [1,2]	2.75 [A]	3.28 [A]	2.62 [A]	3.33 [A]
Aesthetics [1,2]	2.82 [A]	2.85 [A]	2.50 [A]	3.33 [A]
Soil/water conservation [1,2]	3.00 [A]	3.57 [A]	3.25 [A]	3.66 [A]
Invasive species control [1,2]	2.30 [A]	3.14 [A]	2.43 [A]	2.67 [A]
Overall average [1,2]	2.79 [A]	3.28 [A]	2.85 [A]	3.22 [A]
d. Over time				
Practices remain in place [1,2]	3.66 [A]	3.00 [A]	N/A	N/A
Acres remain in forest [1,2]	3.66 [A]	2.25 [A]	N/A	N/A

[1] Likert Scale ratings: 1 = Very ineffective, 2 = Moderately ineffective, 3 = Moderately effective, 4 = Very effective
[2]Tukey's grouping across incentive programs for each respective program attribute. Alpha = 0.05. Means with the same letter are not significantly different.

Part b of Table 3 shows the foresters' mean rankings for each type of program in terms of its effectiveness in encouraging sustainable forestry. Among the state programs, incentive programs ranked higher than property taxes. Both types of programs received high scores for preventing conversion of forest land; incentive programs also scored high for encouraging forest management.

Among the private programs, incentives offered by non-governmental organizations (NGOs) ranked higher than those offered by industry firms and state forestry associations. Programs offered by NGOs received the highest scores for maintaining forest type, protecting wildlife and fish, protecting water quality, and protecting soil productivity, while programs offered by firms and associations received the highest scores for encouraging forest management.

Part c of Table 3 shows the foresters' mean rankings for each type of program in terms of its effectiveness in helping nonindustrial private forest owners meet their objectives of ownership. Although the differences were not statistically significant, state incentive programs again ranked higher than property taxes, and programs offered by NGOs again ranked higher than programs offered by industry firms and state forestry associations.

Both types of state programs received their highest scores for helping owners meet objectives related to timber production and soil and water conservation. State incentive programs also scored well for objectives related to wildlife. Both programs offered by industry firms and state forestry associations and programs offered by NGOs received high scores for objectives related to soil and water conservation. Programs offered by firms and associations also scored well for objectives related to timber production. Programs offered by NGOs also scored well for objectives related to recreation, wildlife, and aesthetics.

The final section (Part d) of Table 3 summarizes the foresters' mean rankings for program practices remaining in place and enrolled acres remaining in forest over time. Property tax programs ranked in the moderately to very effective range for both characteristics, while other state incentives ranked in the moderately effective to moderately ineffective range. The differences, however, were not statistically significant.

Incentive Program Improvement

State agency forester suggestions on ways to improve financial incentive programs centered largely on improving program visibility and availability, increasing and ensuring long-term consistency in program funding, and simplifying the application and approval process for both forest owners and program administrators. Specific suggestions included:

- Targeting forest lands and practices where the benefits would be greatest rather than distributing funds on a first-come, first-served basis.
- Designating a single agency in each state – ideally the forestry agency – as the point of contact for all forest-related financial incentive programs, to reduce the level of confusion among forest owners with respect to program availability, eligibility, and application procedures.
- Improving communication between state agency foresters and the USDA Natural Resources Conservation Service and Farm Service Agency, with the goals of establishing a process for foresters to become technical service providers for, and allowing for more funding of forestry practices in, the financial incentive programs administered by those agencies.
- Building flexibility into program objectives and requirements, so they can be applied to region- and state-specific concerns.
- Improving coordination between programs, such as requiring a written management plan for all programs, and linking financial incentives directly to stewardship practices.

The most frequently mentioned changes for improving preferential property tax programs included increasing funding and simplifying eligibility requirements, administrative procedures, objectives, guidelines, and valuation methods.

Conclusions

The findings presented here must be interpreted with respect to forest acres enrolled in the programs surveyed, not all nonindustrial private forest acres. In a phase of the study reported elsewhere (Greene et al. 2005; Kilgore et al. 2007), focus groups of forest owners noted that public and private financial incentive programs play only a limited role in promoting sustainable practices on nonindustrial private forest land. One reason is that funding of the programs limits the number of acres that can be enrolled. Another is that many forest owners remain unaware that the programs exist. Owner awareness of federal financial incentive programs, for example, peaked in the moderately ineffective range (Table 2, Part b).

The study results indicate there are clear differences between the incentive programs available to nonindustrial private forest owners. FSP, FLEP, and FLP were among the top rated federal programs by all measures, both overall and for individual attributes. All three programs stress multiple objectives, but their clientele is limited to forest owners. Other federal incentive programs have forestry emphases, but their clientele includes farmers and ranchers as well as forest owners.

Programs sponsored by states, industry firms, state forestry associations, and non-governmental organizations generally were more narrowly targeted than federal programs, and scored higher for specific attributes. Such targeted programs have the potential to outperform general conservation programs for regional concerns, emerging issues – for example, invasive species control – and where program funding is constrained.

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