The Practice and Economics of Stewardship Contracting: A Case Study of the Clearwater Stewardship Project

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Abstract

The purpose of the stewardship contracting authority is to allow public land managers to achieve land management goals while meeting local rural community needs. The authority's use is on the rise, and many regard stewardship contracting as a win–win mechanism for federal land management and a means of ending the ''timber wars'' on public land. This report provides an overview of stewardship contracting, with a focus on improvements needed for it to reach its full potential. A case study of the economic impacts of a high-profile pilot project of the new authority, the Clearwater Stewardship Project, is used to illustrate its potential. With impact assessment software (IMPLAN), I find that the project's total economic impact includes a $23 million increase in final sales for 206 industry sectors in eight Montana counties, 148 full- and part-time jobs, $4.6 million increase in wages (2003 dollars), $1.4 million increase in proprietors' income, and $570,000 in indirect business taxes. Over 85 percent of the impacts arise from the harvesting and processing of wood, while 10 percent arise from restoration activities paid for with the receipts from these harvests. The combination of harvesting, wood processing, restoration, administrative, and monitoring activities typical of a stewardship contract serves to spread impacts across a wider variety of economic sectors than timber harvesting alone.

Many regard the use of stewardship contracts (SCs) as a win–win mechanism for federal land management and a means of ending the ''timber wars'' on public land. Coalitions of community stakeholders, industry representatives, and conservationists are making stewardship contracting a primary tool of innovative land management agreements (Beaverhead Deerlodge Partnership 2008, Blackfoot Landscape Cooperative 2008). The use of SCs plays a prominent role in two proposed public land management laws, the Oregon Eastside Forest Restoration, Old Growth, and Jobs Act and the Montana Forest Jobs and Recreation Act. Determining the economic impacts of stewardship contracts can shed light on how they can facilitate harvesting and restoration activities to enhance the economic futures of rural areas communities surrounded by public land.

In 1999, Congress provided the US Forest Service (FS) with new contracting authorities designed to foster restoration on federal forestland using creative approaches and greater participation by local communities in setting and meeting goals (The Wilderness Society 2004, US Government Accountability Office [GAO] 2008). A series of 28 Stewardship Contract Pilot Projects commenced, ending by September 2002. In 2002, the number of authorized SC pilot projects was doubled. In 2003, Congress extended the authority until 2011, gave the same authority to the Bureau of Land Management (BLM), and removed restrictions on the number of projects (US General Accounting Office [GAO] 2004).

FS SCs often take the form of selling timber and using the receipts to offset some or all of the costs of restoration activities. These activities include road and trail maintenance, prescribed fire, vegetation removal for forest stand health and to reduce the risk of high-severity fires, road decommissioning, culvert removal or replacement, nonnative species control, protection and enhancement of fish and wildlife habitat, and construction and maintenance of recreational facilities, including trails (FS and BLM n.d.).

Since their inception, the use of SCs has grown rapidly. Between 2003 and 2007, BLM and FS awarded 535 contracts, 172 of them in 2007 alone (GAO 2008). Moreover, substantive timber volumes are conveyed by these contracts. FS sold 4 percent of its 2.4 billion board feet

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Forest Prod. J. 60(3):213–220.

total timber volume by SC in 2005 and 13 percent of 2.5 billion board feet in 2007 (GAO 2008).[1]

SCs have drawn a plethora of analysis, praise, and criticism (GAO 2004, 2008; National Forest Foundation [NFF] 2005; Rural Voices for Conservation Coalition 2006). One reason for their increasing popularity is the perception that they can deliver substantive economic benefits to local communities.

However, the economics of stewardship contracting projects have been only superficially explored. A recent study laments the lack of consistent record keeping to facilitate such analyses (GAO 2008). One typical review of four large stewardship contracts in Region 6 provides some data on accomplishments on the land (e.g., miles of road storm proofed and acres thinned) and gross values of commercial timber and retained receipts. But there was no analysis of economic impacts in terms of expenditures for restoration activities, affected economic sectors, wages and business incomes, impact multipliers, or jobs (Ecotrust and Resource Innovations 2008). Other studies traced the impacts of funds spent on restoration projects, but data limitations precluded more detailed analyses of the economic activity resulting from the utilization of the harvested forest products (Larson and Mirth 2004, Hjerpe and Kim 2008).

This article has two purposes. First, I provide an overview of stewardship contracting, with a focus on the improvements needed for them to reach their full potential. Second, I present the results of a case study of the economic impacts of a prominent contract, the 2003 to 2004 Clearwater Stewardship Project. I describe the quantities, types, and commercial values of the forest products removed and the economic impacts of these removals. I delineate the types of restoration activities conducted, their costs, and the associated economic impacts. Distinguishing between harvesting and wood products manufacturing, restoration, and administrative/monitoring activities, I compare their respective economic impacts, including differences in the economic sectors they affect, the size of their multipliers, and impacts on businesses, wages, and local tax revenues.

I begin by providing an overview of SCs in practice. This is followed by a description of the case study project's purposes, planning, and implementation. The method used to project the case study project's economic impacts is then described. This is followed by the results of the analysis of the case study along with important caveats in interpreting and using the results. The final section briefly summarizes my findings.

Overview

The general purposes of SCs are ''to achieve land management goals . . . while meeting local rural community needs'' (Pinchot Institute 2008, p. 7). In addition, SCs may encourage collaboration among diverse interests and communities (GAO 2008, Pinchot Institute 2008) with better project designs, community support, and less conflict resulting (GAO 2008).

SCs differ from sales and service contracts in six ways. First, FS and BLM can exchange forest products for contract services. Under this ''goods-for-services'' authority, the local agency administrative office can retain the products' sales receipts rather than returning them to the Department of the Treasury's general fund. Second, agencies can award multiyear contracts, up to 10 years. Third, SCs can be awarded on the basis of ''best value,'' considering features other than price, such as the bidder's technical expertise, past performance, capacity for careful stewardship, and employment of local workers. Fourth, ''end-result'' SCs allow the agency to use ''designation by description'' or ''designation by prescription'' with bidders submitting plans showing how they will achieve agency objectives. Fifth, SC awards can be made under less than full and open bidding competition to address complex ownership patterns, difficult pricing scenarios, community capacity, and local economic growth. Sixth, SCs require collaboration and monitoring. Planning and implementation participants may include neighboring landowners, local governments, tribes, community groups, and other public interests. Project results monitoring is designed to include community and public interests.

Although SCs have produced many positive outcomes, there are four obstacles to be overcome for SCs to reach their full potential. First, FS and BLM have encountered internal and external resistance. One source of resistance is contractors, who argue that the technical proposals required for a winning bid are intimidating and time consuming (NFF 2005, GAO 2008, Pinchot Institute 2008). Contractors express reluctance to bid on or carry out work with which they are unfamiliar (GAO 2008) and are uncertain of the criteria use to select winning bids (NFF 2005). Local contractors argue that complexity and high bonding requirements give a bidding advantage to regional or national businesses with large mobile workforces and specialized equipment (NFF 2005, Pinchot Institute 2008). If these businesses are awarded contracts, the goal of ''meeting local rural community needs'' is attenuated.

Another source of resistance is agency personnel. SCs blur the line between traditionally very separate agency functions—procurement and timber contracting. Timber staff are familiar with timber contracts but not procurement procedures; the opposite is the case for procurement staff. This makes both types of staff reluctant to use an SC or requires the two staff types to work together. Communication and coordination across functional areas is difficult, and staff are reluctant to work together (NFF 2005, GAO 2008). Agency staff also complain of a lack of a central source of expertise and guidance on SC (NFF 2005), a perception that is compounded by frequent turnover in central SC personnel in both agencies (GAO 2008).

A third source of resistance consists of county commissioners and other local public officials. These agents often oppose stewardship contracts because receipts from SC do not count as timber receipts from which counties receive revenues. Substantial opposition to SCs has been noted in Montana, Wisconsin, Oregon, and the Great Lakes states (GAO 2008, Becker et al. 2009).

A final source of resistance is environmental groups. Some argue that ecological restoration is not sufficiently incorporated into projects (NFF 2005). Others claim that SCs can be little more than timber sales disguised as forest restoration, with less-than-adequate monitoring. They worry that ''goods for services'' will encourage loggers to take more and bigger timber and that retained receipts take timber revenues ''off budget,'' decreasing public scrutiny of

[1] BLM uses stewardship contracts to convey a smaller fraction of total timber volume, 10 percent in 2005 and 4 percent in 2007 (GAO 2008, p. 19).

agencies (Little 2000, American Lands Alliance 2004). Some environmentalists argue that ''designation by description'' gives too much discretion to contractors, who may underemphasize wildlife habitat and other ecological components. Many decry the lack of monitoring. Although the original authorization required multiparty monitoring of SC, this requirement was removed in 2003. Now only programmatic monitoring is required (American Lands Alliance 2004). GAO (2008) notes that little socioeconomic or environmental monitoring activity occurs. In fact, FS guidelines do not allow receipts from SCs to be used for environmental monitoring (GAO 2008). The monitoring that is done focuses on project implementation rather than project outcomes. The latter effectiveness monitoring is needed to assess the impacts of restoration activities and inform adaptive management (NFF 2005). A suggestion is for agencies to partner with (and perhaps fund) research universities to establish monitoring protocols, conduct analysis, and manage data (NFF 2005).

Second, the low value of small-diameter material often targeted by SCs does not provide sufficient revenue for contractors to make a profit or agencies to fund non–timber management goals. The market for small-diameter trees can be quite strong in areas near pulp and paper mills. Elsewhere, there is little market for small-diameter wood, and sometimes it is more cost effective to burn the wood than use it (NFF 2005, GAO 2008). Low or variable expected revenues worry environmentalists who argue that restoration work should be not be subject to the vagaries of market prices.

Third, agencies have difficulty implementing long-term contracts. Contracts beyond 1 or 2 years are little used, even though the SCs can be up to 10 years (NFF 2005). Some of the difficulties stem from a lack of funding for planning staff time (NFF 2005). Moreover, a contractor entering into a long-term contract may want a substantial cancellation ceiling, i.e., the bond the agency must post to protect the contractor's investment in the event the agency cancels. Facilities using small-diameter material (e.g., woody biomass to energy or wood pellet facilities) must have something close to certainty of supply to build, and since these facilities are costly and last 20 years or more, investors will not commit their financial capital without guarantees that material will be available. Yet the cancellation ceiling may be beyond the capabilities of the regional or field office or at odds with their other goals.[2] In addition, the annual service work in a multiyear contract can have more financial impact than anticipated if project costs increase or revenues decline. To continue funding the contracted work, a regional or field office may have to sacrifice other programs to pay for the multiyear contract.[3] The obstacles to implementing long-term contracts is especially troublesome because many argue that 10-year and longer contracts will be required to stimulate the potential woody biomass to energy markets (GAO 2008).

Fourth, inclusive collaboration has not occurred at the desired level, and no one seems quite sure of what form collaboration should take and how to achieve it (NFF 2005). Effective collaboration as a goal of SCs is ranked highly by agency and nonagency respondents in a recent survey of participants in past SCs (GAO 2008). Yet 30 percent of respondents felt that groups were missing from the collaborative process (GAO 2008). Collaboration could be enhanced by a variety of factors, including incentives to agency staff, partnerships with diverse organizations, facilitation, training (NFF 2005, Pinchot Institute 2008), and developing readily available sources of guidance (NFF 2005).

The Clearwater Stewardship Project

The Clearwater Stewardship Project (CSP) occurred on the Seeley Lake District of Lolo National Forest (Montana) in 2003 and 2004 over a project area of 6,800 acres. Formally known as the Clearwater Ecosystem Management and Timber Sale, CSP was focused on enhancing recovery potentials of two endangered species, grizzly bear (*Ursus arctos horribilis*) and bull trout (*Salvelinus confluentus*); maintaining forest health and ecological processes; treating noxious weeds; and enhancing scenic views along a popular forest road (Austin 2001).

For the grizzly, the goal was a reduction in road densities in the Bear Management Study Area containing the project area to conform to standards adopted by the FS in consultation with the US Fish and Wildlife Service (Seeley Lake Ranger District, III, 2001, pp. 13–15).[4] Roughly, the standard was $<$19 percent of the area with total road densities exceeding 2 miles per section (640 acres). This was less than the actual 27.5 percent. Reducing road density was especially important to promote connections between grizzlies in the Swan Mountains with the much smaller Mission Mountain population (Seeley Lake Ranger District, III, 2001, p.15). The CSP's restoration activities included 3.2 miles of road closure and 38 miles of nonsystem[5] road obliteration (Austin 2001).[6] In addition, 13.7 miles of road were constructed or reconstructed to facilitate timber harvests and then obliterated within 1 year (Austin 2001).

To enhance bull trout habitat, CSP aimed at sediment reductions in the Upper Clearwater River by obliterating roads and applying best management practices to 13.4 miles of the popular Clearwater Loop Road. Consensus held that elevated levels of sediments from roads and other surface disturbances posed a threat to bull trout recovery (Seeley Lake Ranger District, IV, 2001, p. 37; Fraley and Shepard 1989). Sediment levels in the Upper Clearwater River were more than double modeled natural levels (Seeley Lake Ranger District, IV, 2001, p. 39). Although FS expected constructing temporary harvesting roads and obliterating

[2] GAO (2008, pp. 46–47) cites two examples of cancellation liabilities of $3 to $10 million.

[3] GAO (2008, pp. 48–49) reports that meeting the acreage treatment requirements of the White Mountain SC required sacrifice of 50 percent of the national forest's vegetation and watershed dollars and 40 percent of its wildlife dollars.

[4] Evidence of the adverse impacts of roads and traffic on grizzly bear is found in Mace et al. (1996) and Apps et al. (2004).

[5] The nonsystem roads relevant to the CSP are officially uninventoried roads defined as ''short term roads associated with fire suppression, oil, gas, or mineral exploration . . . or timber harvest not intended to be a part of the forest development transportation system and not necessary for resource management'' (Coghlan and Sowa 1998, p. 7).

[6] Other species expected to benefit from improved foraging and/or denning habitat include pileated woodpecker, lynx, fisher, and black-backed woodpecker. Some adverse effects on elk due to decreased security during harvest activity were expected (Seeley Lake Ranger District, IV, 2001, p. 36).

existing roads to cause a short-term pulse of sediment, it also asserted that best management practices and road obliteration would reduce long-term sediment levels by about 40 tons per year, or about 10 percent of extant levels (Seeley Lake Ranger District, IV, 2001, p. 49). FS expected that restricting logging to winter over 2 feet of snow would hold sediments from harvesting at zero (Seeley Lake Ranger District, IV, 2001, p. 47).

To maintain forest health, CSP was designed to return natural fire processes by reducing stand densities in some lodgepole (*Pinus contorta*) stands by harvesting and reintroducing low- or moderate-intensity fires to create larger patch sizes and fire-killed stands (Austin 2001). Approximately 418 acres were treated with an intermediate harvest, 152 acres were harvested to create openings, and 150 acres were burned but not harvested to create fire-killed dead trees (Austin 2001). Harvesting prescriptions were also designed to reduce the susceptibility of lodgepole stands to mountain pine beetle mortality (Austin 2001).

Spraying of noxious weeds occurred along 37 miles of obliterated roads and 10 miles of additional road (Austin 2001). Enhancing scenic views was accomplished by removing trees to create vistas along the Clearwater Loop road and making 1- to 2-acre openings to soften the straight lines of an existing regeneration unit visible from the road (Austin 2001).

Pyramid Mountain Lumber, Inc., of Seeley Lake, Montana, purchased the stewardship contract for nearly $1 million (USDA Forest Service 2004).[7] Using contract loggers, Pyramid harvested 29,479 tons (1.327 million cubic feet [MMCF]) of wood from 640 acres, consisting of 1.165 MMCF of sawlogs and 0.162 MMCF of smaller roundwood. Pyramid's Seeley Lake mill received more than three-fourths of the sawlogs. Missoula and Deerlodge, Montana, mills received the remainder.[8] The smaller roundwood was sold to five different post and pole mills, some over 100 miles distant (G. Sanders, personal communication, March 8, 2008).

In addition to timber harvest, $842,000 in land management (restoration) activities (LMAs) was completed using eight subcontractors from seven Montana counties under the supervision of Pyramid Mountain Lumber, Inc. (G. Sanders, personal communication, March 8, 2008). LMAs included, in addition to those already discussed, the building of seven new bridges with arched pipes to replace small, failure-prone culverts; replacing campground outhouses with vault toilets; and restoring 2 miles of streams, including replacement of undersized culverts to improve bull trout migration.

While in progress, CSP received extensive recognition and was toured by members and staff of the Western Governors Association (Devlin 2003). It has since been touted as a model project (Bosworth 2003, Hausbeck 2007).

Analysis Methodology

This study projects the economic impacts of CSP. We describe these impacts in terms of changes in final demand (sales), employment (full- and part-time jobs), employees' compensation, proprietors' income, and indirect business taxes in as many as 509 business sectors.

The method consists of three parts. First, I obtained data for fiscal year 2003 on the economic behavior of up to 509 business sectors, several representative consumers, and federal, state, and local government spending units (Minnesota IMPLAN Group 2004). I selected data from the counties of Missoula, Mineral, Ravalli, Granite, Deerlodge, Silverbow, Powell, and Lewis and Clark into the economic study area (ESA) examined here. These counties contained businesses that either received harvested products of the CSP or were the home bases of harvest or LMA subcontractors.[9]

Second, I used information on total harvests, expenditures for LMAs, and administrative and monitoring (AM) expenditures to obtain the changes in final demand of the sectors directly impacted by CSP. For harvest and wood products manufacturing-related activities (HWP), I begin with the information that the CSP resulted in the harvest of 29,479 tons of roundwood, 87.8 percent sawlogs, and 12.2 percent smaller roundwood (G. Sanders, personal communication, March 8, 2008).[10] At 45 cubic feet per ton, CSP's harvest was 1.165 MMCF of sawlogs and 0.162 MMCF of smaller roundwood. To translate these quantities into changes in final demand, I used the direct-response coefficients from the University of Montana's Bureau of Business and Economic Research and salary information for various wood product sectors (Morgan et al. 2008) to edit the ESA's regional accounts to be more locally accurate. The direct-response coefficients gave locally verified data on the number of employees per unit of timber volume harvested as this volume flows through the product chain from harvest to manufacturing and to residue use (Morgan et al. 2008).

The first part of Table 1 gives the direct changes in final demand for HWP activities (logging, forestry support, sawmills, post and pole, residue manufacture, and power generation) and details of their derivation. As Table 1 shows, CSP resulted in projected final demand increases of $6.8 million in the logging and forest support sectors, $5.5 million in the sawmill and wood preservation (post and pole) sectors, and $2.9 million in sectors using wood residue, including power generation.

For the LMAs paid for with timber receipts, Steward (2003) reports the following expenditures: weed spraying, $3,770; road decommissioning and repair, $512,231; campground construction and repair, $177,061; fish habitat and channel stabilization, $800; paving, $90,311; and burning and thinning, $8,750. Love (personal communication, February 27, 2008) reported an additional $49,000

[7] Pyramid Mountain Lumber, Inc.'s, winning bid was $935,958. Expenditures for land management activities totaled $841,923, which provided direct increases in final sales for three economic sectors. Of the $94,035 difference, some was returned to the FS for miscellaneous charges, but most was spent on other activities on the Game Range Stewardship Project (T. Love, District Ranger, Seeley Lake Ranger District, Lolo National Forest, personal communication, February 27, 2008).

[8] Pyramid is a technologically sophisticated board mill that utilizes lodgepole and spruce sawlogs with roughly 12-inch diameter at breast height and 4- to 5-inch tops. The other mills utilize sawlogs with 5- to 6-inch tops (G. Sanders, Resource Manager, Pyramid Mountain Lumber, Inc., personal communication, March 8, 2008).

[9] E-mail correspondence with G. Sanders, March 4, 2008.

[10] Smurfit-Stone, the state's only pulpwood buyer, was not purchasing smaller roundwood for pulping at the time.

Table 1.—Changes in final demand resulting from CSP activities.

Source of change in final demand	Amount (2003 dollars)	Sector(s) experiencing change in demand	Justification
Logging	6,551,365	Logging (sector #14)	Assumes 20 harvesting jobs were generated by each MMCF produced, 65% in logging. Assumes logging jobs paid $36,363 annually (see Morgan et al. 2008).
Forestry support	307,287	Agriculture and forestry support (sector #18)	Assumes 20 harvesting jobs were generated by each MMCF, 35% in forestry support. Assumes forestry support jobs paid $22,727 annually (see Morgan et al. 2008).
Sawmills	3,499,837	Sawmills (sector #112)	Assumes 12 jobs in sawmills were generated by each MMCF. Assumes sawmill jobs paid $40,909 annually (see Morgan et al. 2008).
Post and pole	2,008,125	Wood preservation (sector #113)	Assumes 54 jobs in post and pole mills were generated by each MMCF. Assumes the post and pole sector paid $31,818 annually (see Morgan et al. 2008).
Residue manufacture	205,128	Miscellaneous wood product manufacturing (sector #123)	Assumes five jobs were generated in residue sectors for each MMCF, 38% in medium-density fiberboard, 39% in paperboard, and 18% in other wood products. Assumes annual wages of $77,272, $90,909, and $47,100, respectively. See Morgan et al. (2008) and IMPLAN (2003) study for data, respectively.
	1,200,036	Paper and paperboard mills (sector #125)	
	1,005,264	Reconstituted wood product manufacturing (sector #114)	
Power generation and supply	236,000	Sector #30	Assumes five jobs were generated in residue sectors for each MMCF, 5% in the energy sector. Assumes annual wages in this sector were $110,662. See Morgan et al. (2008) and IMPLAN (2003) study for data, respectively.
Expenditures for land management activities, paid to various contractors	652,327	Road maintenance and repair (sector #44)	Funds expended as reported by Steward (2003) and Love (2008).
	177,056	Other maintenance and repair construction (sector #45)	
	12,545	Agriculture and forestry services (sector #18)	
Expenditures by FS for planning, contract preparation, administration, and monitoring	492,471	$492,471 allocated to the expenditure pattern of state and local agricultural and natural resource agencies	As reported by USDA Forest Service (2004).
Expenditures for third-party monitoring, including site visits	2,000	$2,000 allocated to the expenditure patterns of state and local educational facilities beyond high school	Assumes no additional agency funds or other outside funds used for these purposes.

spent for road decommissioning. As Table 1 shows, I allocated these expenditures as $652,327 to the road repair and maintenance sector, $177,056 to the other construction and repair sector, and $12,545 to the agriculture and forestry support sector.

The USDA Forest Service (2004, p. 8) reports the following expenditures for administration: planning and National Environmental Policy Act, $225,000; contract/sale preparation, $118,000; contract/sale administration, $113,900; service contract, $33,200; and monitoring/evaluation reporting, $2,371. Thus, Table 1 shows $492,471 in additional expenditures in the consumption expenditure pattern of natural resource agencies.

The Gifford Pinchot Institute awarded a $2,000 grant to support monitoring activities and preparation of a final report by the third-party monitoring committee (J. Burchfield, Chair of Clearwater Stewardship Monitoring Committee, personal communication, March 21, 2008). We allocated this sum to the consumption pattern of educational facilities because most third-party monitoring was organized by University of Montana personnel.

In the third part of the method, I used IMPLAN software (Minnesota IMPLAN Group 2004) to project the total economic impacts of the changes in final demand. IMPLAN uses a system of linear structural input–output equations describing the purchase and sales decisions of as many as 509 economic sectors, several representative consumers, and several types of federal, state, and local governmental units. IMPLAN is widely used by federal agencies, academics, and private consultants to estimate the impacts of various projects, including proposed changes in resource management plans (e.g., see Cox and Munn 2001, Schallau et al. 2002, Cook and O'Laaughlin 2006, Perez-Verdin et al. 2008).

The basis of IMPLAN is that an increase in business' sales (final demand) in one economic sector stimulates economic activity in other sectors. This is because one sector buys from other sectors in order obtain the inputs needed to produce the goods or services it sells. These are called backward linkages. In addition, as purchases from backward linkages proceed, the incomes of owners and employees increase, and as this income is spent, further economic activity is stimulated. The *direct effect* is the change in economic activity as final demand changes. The *indirect effect* is the increased economic activity as the sector with the change in final demand makes purchases from other sectors. The *induced effect* is the impact on all local industries caused by expenditures of new household

Table 2.—*Economic impacts of harvesting, land management activities, and administration (2003 dollars).*

Type of impact	Output (sales to final demand) ($)	No. of employees (full- and-part time jobs)	Employee compensation ($)	Proprietor's income ($)	Indirect business taxes ($)
		Harvest and wood products manufacturing			
Direct	15,013,076	55.0	2,559,804	928,030	120,288
Indirect	3,212,211	31.8	850,308	174,898	210,025
Induced	2,954,622	39.5	792,200	168,071	196,626
Total	21,179,909	126.3	4,202,312	1,270,998	526,938
		Land management activities			
Direct	841,928	10.6	220,717	102,416	5,380
Indirect	203,257	2.6	59,944	18,907	9,701
Induced	265,359	3.5	71,149	15,095	17,659
Total	1,310,544	16.8	351,810	136,417	32,740
		Monitoring and administration			
Direct	494,471	3.2	64,897	16,427	7,671
Indirect	57,943	0.7	15,214	4,292	3,170
Induced	65,584	0.9	17,585	3,731	4,365
Total	617,999	4.8	97,696	24,450	15,206
		Total projected economic impacts			
Direct	16,349,475	68.8	2,845,418	1,046,873	133,339
Indirect	3,473,411	35.1	925,466	198,097	222,896
Induced	3,285,565	43.9	880,934	186,897	218,650
Total	23,108,451	147.6	4,651,818	1,431,865	574,884

income generated by the direct and indirect effects of the initial changes in final demand (Minnesota IMPLAN Group 2004, p. 81). All three effects—direct, indirect, and induced—are larger as a higher percentage of purchases are made within the ESA. This percentage will vary across business sectors and across counties and/or agglomerations of counties (Minnesota IMPLAN Group 2004).

IMPLAN provides a convenient and widely used means of projecting economic impacts, but it relies on strong assumptions, and its results should be interpreted with caution (Hamilton et al. 1991, Compton et al. 2001, Hughes 2003). With its focus on projected changes in economic indicators of outputs, employment, employee compensation, and tax revenues, the study may miss important components of the economic, ecological, and social well-being of the impacted communities (Seidle and Myrick 2007).

Projected Economic Impacts

The eight-county ESA contains 15,182 square miles of land and had a population of 250,938 in 2003. Employment was 172,000 ESA residents, with an average household income of $57,764 (2003 dollars). There were 270 active economic sectors in the ESA's $6.6 billion economy.[11]

Table 2 presents the projected economic impacts of the CSP in four sections. The first section presents the projections of the economic impacts of HWP activities, including delivery of sawlogs and other roundwood. The impacts are reported as direct, indirect, and induced impacts for the harvesting activities. The second section of Table 2 reports the projected impacts of the LMAs, also disaggregated into direct, indirect, and induced impacts. The third section gives projected impacts of CSP's AM activities, while the last section gives the sum of all impacts.

[11] This summary was from the IMPLAN model assembly.

The direct impacts of CSP totaled more than $16 million (2003 dollars) in final demand. These direct increases prompted final demand increases totaling $23.1 million, with $3.5 million in indirect impacts and $3.3 million in induced impacts. These increases were spread widely throughout the economy, with positive total impacts in 206 sectors in the ESA.

Direct employment impacts were 69 full- and part-time jobs. Total employment impacts were 148 full- and part-time jobs. Accompanying this was a $6.08 million increase in wages (77%) and proprietors' incomes (33%). The high percentage of impact to proprietors' incomes reflects the high percentage of self-employed workers in logging and LMA contractors' sectors in the ESA. Over $570,000 in indirect business taxes was generated by CSP, 92 percent from harvest-related activities.

Impact multipliers translate direct impacts into total impacts as businesses spend on inputs (indirect impacts) and employees' households spend on consumption (induced impacts). For CSP, the final demand multiplier is 1.41, while the employment, wages, and proprietors' income multipliers are 2.14, 1.63, and 1.37, respectively. These are well within the reasonable range given for multipliers in ESAs of this size (Hughes 2003).

Discussion

For CSP, the largest economic impacts arise from HWP activities, which accounted for 92 percent of the direct impacts. LMAs and AMs were responsible for 5 and 3 percent, respectively. Similarly, HWP activities contributed 85 percent of the total employment impact of 148 jobs, while LMAs contributed 11 percent and AMs 3 percent. It is unlikely that the disproportionate contribution to economic impacts of HWP activities is typical of stewardship contracts. This is because much of the LMA work was funded with revenues from the relatively high value sawlogs dominating CSP's harvests, whereas lower-value small-diameter mate-

Table 3.—Ten largest increases in final demand by activity type.

HWP related		LMA related		AM related	
Sector	Total increase in sales (mil $, 2003)	Sector	Total increase in sales (mil $, 2003)	Sector	Total increase in final demand (mil $, 2003)
Logging	6.551	Maintenance and repair of highways	0.652	Domestic trade	0.237
Sawmills	3.500	Other maintenance and construction	0.178	Services to buildings and dwellings	0.031
Wood preservation	2.008	Architectural and engineering services	0.048	Other state and local governments	0.025
Paper and paperboard	1.200	Owner occupied dwellings	0.036	Maintenance and repair of nonresidential buildings	0.022
Reconstituted wood products	1.005	Real estate	0.025	Food services and drinking places	0.022
Wholesale trade	0.731	Truck transportation	0.023	Foreign trade	0.020
Power generation and supply	0.577	Food services and drinking places	0.020	Real estate	0.019
Owner-occupied dwellings	0.396	Hospitals	0.018	Power generation and supply	0.018
Real estate	0.384	Offices of physicians and dentists	0.017	Other maintenance and repair construction	0.016
Monetary authorities and depositories	0.338	Monetary authorities and depositories	0.013	Wholesale trade	0.015

rial is more typical of harvests from SCs (GAO 2008). When project funds are derived from stumpage, economic impacts are created in both harvesting and processing and in LMA work. When funds are from other sources, economic impacts arise solely from LMA work.

With one exception, I found little difference in the multipliers arising from the various activities. Wage multipliers were 1.64, 1.58, and 1.51 for HWPs, LMAs, and AMs, respectively. Proprietors' income multipliers ranged from 1.36 to 1.49. The exception is employment, where the harvest-related multiplier was 2.29 compared with 1.58 for LMAs and 1.50 for AMs.

I found substantive differences across activity types in terms of the most impacted business sectors. Table 3 shows the total impacts for the top 10 sectors for each activity type. As expected, HWP impacts are concentrated in the directly affected sectors, logging, sawmills, wood preservation, and residue users. The exception was forestry support, which showed relatively small total impacts because of relatively low wages in this sector. Other sectors strongly affected by harvest-related activities are wholesale trade, power generation, owner-occupied dwellings, real estate, and banks.

LMA impacts were concentrated in the maintenance and repair of highways and other maintenance and construction sectors, followed by architectural and engineering services, owner-occupied dwellings, and real estate. Domestic trade had the lion's share of impacts for AM. The diversity of highly impacted sectors shown in Table 3 suggests that the variety of activities involved in SCs serves to spread the impacts of public land management projects across a wider spectrum of economic sectors than timber harvesting or restoration in isolation.

Several caveats are in order when interpreting and using the economic impact results. First, these results represent ''best guesses'' that depend on strong assumptions either inherent to the IMPLAN model or used in applying the model to CSP (Compton et al. 2001).

Second, statewide industry averages formed the basis of the direct-response coefficients used to translate harvest volumes into new jobs and increases in final sales. If there was excess capacity and underemployment in these industries, these averages would overstate the marginal impacts of increased harvests. In other words, contractors and sawmills with excess capacity and underemployed loggers and forest support workers may have been able to harvest and process material from the CSP and perform LMAs with little or no increase in employment or wages. Conversely, if capacity is constrained and there is declining marginal worker productivity, the direct-response coefficients would understate the actual direct impacts.

Third, the sizes of the various multipliers and the resulting projected economic impacts are dependent on assumptions made about which counties to include in the ESA. Briefly, the larger the ESA, the less income leaks from it and the larger the projected impacts (Compton et al. 2001, Hughes 2003). This study assumed that the ESA included all eight counties that contained businesses either receiving harvested products or serving as home bases of subcontractors. If, instead, I had confined the ESA to Missoula County and Deerlodge County, where all HWP, LMA, and AM activities occurred, the economic impacts would have fallen by 30 to 40 percent.

Finally, although economic impacts are important to rural communities, they are not likely to accurately represent the net benefits of harvest or restoration activities (Hamilton et al. 1991) or reflect the major motivation for restoration work (Clewell and Aronson 2006). Specifically, the CSP was focused primarily on enhancing recovery potentials of two endangered species (bull trout and grizzly bear), maintaining forest health and ecological processes, treating noxious weeds, and enhancing scenic views along a popular forest road (Austin 2001). Measuring the economic benefits of CSP's contribution to these end points is beyond the scope of this article.

Summary

This report reviews the growing use of stewardship contracting practiced by the FS and BLM with a focus on improvements needed for the contracting authority to reach its full potential. I then present the results of a case study of the economic impacts of a high-profile pilot project, the Clearwater Stewardship Project. With often-used impact assessment software (IMPLAN), I found that the project's total economic impact includes a $23 million increase in final sales for 206 industry sectors in eight Montana counties, 148 full- and part-time jobs, a $4.6 million increase in wages (2003 dollars), a $1.4 million increase in proprietors' income, and $570,000 in indirect business taxes. More than 85 percent of the impacts arise from the harvesting and processing of wood, while 10 percent arise from restoration activities paid for with the receipts from these harvests. The combination of harvesting, wood processing, restoration, administrative, and monitoring activities typical of a stewardship contract serves to spread impacts across a wider variety of economic sectors than timber harvesting alone.

Literature Cited

American Lands Alliance. 2004. Legislative analysis: The Stewardship Contracting Program. American Lands Alliance, Washington, D.C.

Apps, C. D., B. N. McLellan, J. G. Woods, and M. F. Proctor. 2004. Estimating grizzly bear distribution and abundance relative to habitat and human influence. *J. Wildl. Manag*. 68(1):138–152.

Austin, D. R. 2001. Record of Decision, Clearwater Ecosystem Management and Timber Sale Project, Seeley Lake Ranger District. USDA Forest Service, Washington, D.C. pp. 1–30.

Beaverhead Deerlodge Partnership. 2008. Draft legislation: Beaverhead Deerlodge Conservation, Restoration, and Stewardship Act of 2007. www.bhdlpartnership.org/legislation.htm. Accessed October 15, 2008.

Becker, D. R., D. Abbas, K. E. Halvorsen, P. J. Jakes, S. M. McCaffrey, and C. Moseley. 2009. Conventional wisdoms of woody biomass utilization. Department of Forest Resources, University of Minnesota, Minneapolis.

Blackfoot Landscape Cooperative. 2008. A landscape level proposal. www.blackfootclearwater.org. Accessed June 15, 2009.

Bosworth, D. 2003. Statement of Dale Bosworth, Chief, Forest Service, before the US House of Representatives Committee on Resources, Washington, D.C. pp. 1–5.

Clewell, A. F. and J. Aronson. 2006. Motivations for the restoration of ecosystems. *Conserv. Biol*. 20(2):420–428.

Coghlan, G. and R. Sowa. 1998. National forest road system and use. USDA Forest Service, Washington, D.C.

Compton, J. L., S. Lee, and T. J. Shuster. 2001. A guide to undertaking economic impact studies: The Springfest example. *J. Travel Res*. 40(1):79–87.

Cook, P. and J. O'Laaughlin. 2006. Idaho's forest products sector: Contributions, challenges, and opportunities. Policy Analysis Group, College of Natural Resources, University of Idaho, Moscow.

Cox, B. and I. Munn. 2001. A comparison of two input-output approaches for investigating regional economic impacts of the forest products industry in the Pacific Northwest and the South. *Forest Prod. J*. 51(6):39–46.

Devlin, S. 2003. Model of stewardship. *Missoulian*. http://www.missoulian.com/articles/2003/06/16/news/local/news01.txt. Accessed October 30, 2008.

Ecotrust and Resource Innovations. 2008. Redefining stewardship: Public lands and rural communities in the Pacific Northwest. Ecotrust and Resource Innovations, Portland, Oregon. pp. 1–22.

Fraley, J. J. and B. B. Shepard. 1989. Life history, ecology, and population status of migratory bull trout (*Salvelinus confluentus*) in the Flathead Lake and River System, Montana. *Northwest Sci*. 63: 133–143.

Hamilton, J. R., N. K. Whittlesey, M. H. Robison, and J. Ellis. 1991. Economic impacts, value added, and benefits in regional project analysis. *Am. J. Agric. Econ*. 31(2):334–344.

Hausbeck, K. 2007. The little engine that could: The success of the Stewardship Contracting Authority. *Environ. Law Pol. Rev*. 32(Fall): 33–55.

Hjerpe, E. E. and Y.-S. Kim. 2008. Economic impacts of southwestern national forest fuels reductions. *J. Forestry* 106(6):311–316.

Hughes, D. W. 2003. Policy uses of economic multiplier and impact analysis. *Choices*. Second Quarter:25–29.

Larson, D. S. and R. Mirth. 2004. A case study on the economics of thinning in the wildland urban interface. *West. J. Appl. Forestry* 19(1): 60–65.

Little, J. B. 2000. Stewardship's trial by forests: Pilot projects revamp strategies and goals for national forests. *Am. Forests* 106:49–55.

Mace, R. D., J. S. Waller, T. L. Manley, L. J. Lyon, and H. Zuuring. 1996. Relationships among grizzly bears, roads, and habitat in the Swan Mountains, Montana. *J. Appl. Ecol*. 33:1395–1404.

Minnesota IMPLAN Group. 2004. IMPLAN Professional, Version 2.0. Social Accounting and Impact Analysis Software. Minnesota IMPLAN Group, Stillwater.

Morgan, T. A., C. E. Keegan, and J. P. Brandt. 2008. Employment and labor income direct response coefficients for the U.S. forest products industry. Report submitted to the USDA Forest Service, Forest Inventory and Monitoring Institute and Policy Analysis Group, Fort Collins, Colorado. 13 pp.

National Forest Foundation (NFF). 2005. Stewardship Contracting Roundtable, Region 6, Forest Service. NFF, Missoula, Montana.

Perez-Verdin, G., D. L. Grebner, I. A. Munn, C. Sun, and S. C. Grado. 2008. Economic impacts of woody biomass utilization for bioenergy in Mississippi. *Forest Prod. J*. 58(11):75–83.

Pinchot Institute. 2008. The role local communities play in developing stewardship contracts. Pinchot Institute, Washington, D.C.

Rural Voices for Conservation Coalition. 2006. Stewardship contracting issue paper. Sustainable Northwest, Portland, Oregon. pp. 1–4.

Schallau, C., P. Polzin, and M. Bennett. 2002. Flaws in an assessment of forest resources in the southern Appalachian region. *Forest Prod. J*. 52(3):44–49.

Seeley Lake Ranger District. 2001. Environmental impact statement for clearwater ecosystem and timber sale projects. USDA Forest Service, Region 1, Missoula, Montana.

Seidle, A. and E. Myrick. 2007. The economic valuation of community forestry: Analytical approaches and a review of the literature. Economic Development Report. Department of Agricultural and Resource Economics, Colorado State University, Fort Collins.

Steward, F. 2003. Clearwater Stewardship Outputs, Monitoring and Evaluation Project, April 22, 2003. USDA Forest Service, Region 1, Missoula, Montana. (Mimeograph.)

US Department of Agriculture Forest Service. 2004. Clearwater Stewardship Project monitoring/evaluation report. Lolo National Forest, Missoula, Montana.

US Department of Agriculture Forest Service (FS) and Bureau of Land Management (BLM). n.d. Everything you wanted to know about stewardship end result contracting . . . but didn't know what to ask. www.fs.fed.us/forestmanagement/projects/stewardship/documents/EverythingYouWantedtoKnowAboutSC.pdf. Accessed August 11, 2010.

US General Accounting Office (GAO). 2004. Additional guidance on community involvement could enhance effectiveness of stewardship contracting. GAO, Washington, D.C.

US Government Accountability Office (GAO). 2008. Use of stewardship contracting is increasing, but agencies could benefit from better data and contracting strategies. GAO, Washington, D.C. pp. 1–66.

The Wilderness Society. 2004. Stewardship contracting: An assessment of opportunities for forest restoration and rural communities. *Science and Policy Brief* No. 7:1–8.