Review of Stewardship Harvesting Case Studies

As documented in recent TSPIRS Reports, the national forest timber sales program has undergone significant change during the last decade. One of the most fundamental changes has been the ongoing shift in the underlying reasons for selling national forest timber. In the past, the vast majority of sales were made primarily to provide commercially valuable timber to help meet the nation's demand for wood. As recently as FY 1993 such sales, called "timber commodity" purpose sales, accounted for almost three-fourths of all the national forest timber being harvested. More recently, however, more and more timber sales are being undertaken primarily to achieve, in a least net cost manner, a broad array of land management objectives that require manipulating the existing vegetation – e.g., improving forest health, reducing the risk of catastrophic fire, and creating desired habitat conditions for wildlife. Such sales are called "forest stewardship" purpose sales.

As this shift towards stewardship purpose sales has become more dramatic, the Agency has come to believe that the accomplishment measures traditionally stressed in TSPIRS – e.g., volume offered, sold and awarded, and profitability – are much less relevant to evaluating program performance than they once were. This situation prompted Chief Dombeck, following release of the FY 1997 report, to create a taskforce to formulate recommendations on how TSPIRS might be modified so as to henceforth do a better job of depicting the vital role that national forest timber sales are presently playing in helping to restore the health of forest ecosystems and watersheds.[1] After completing its work, one of this taskforce's recommendations was to include a series of case studies in future TSPIRS reports that would illustrate how the Agency is presently using timber sales as a tool to help achieve different forest stewardship objectives in a least net cost manner.[2] This chapter has been prepared in response to that recommendation.

Objectives of Review

The basic objective of the case study reviews is to provide specific examples of how national forest managers are currently using timber sales as a tool to achieve, often in a least net cost manner, a diversity of important land management objectives other than fiber production. In recent years there has been a growing perception that national forest timber is sold for only one reason – to provide essential raw material to the forest

[1] See Chief's letter of June 11, 1998, on the subject of "tracking forest management accomplishments."
[2] See decision memorandum sent to the Chief on September 25, 1998, on the subject of "tracking forest management accomplishments."

products industries. These examples will hopefully show, in a forceful and persuasive way, that this is not the case.[3]

In reviewing each case study, emphasis has been placed on documenting two things: 1) the resource management objectives that the project was intended to achieve, and 2) the reasons why a timber sale was chosen as the primary tool for implementing the project. Other topics discussed, as appropriate, include the following: the number of acres subject to different types of treatments; the outputs produced; the steps taken to prevent and/or mitigate the potential undesirable side-effects of the treatments being applied; and the public reaction to the project before, during and after completion. Photographs have been included, as available, to illustrate the pre- and/or post-treatment conditions of the project areas. Finally, where a particular project had progressed to termination, each review concludes with an assessment of its overall success.

Regional Case Studies

The case studies highlighted in this report were selected after requesting nominations from the field. In the letter requesting nominations, field units were instructed to nominate "representative" projects, not projects that they considered to be their "best" or "most favorable" efforts. Ultimately one project was selected from each Region. These selections were made so as to ensure that the chosen projects, when considered in combination, would illustrate the use of timber sales within a wide range of different management contexts.

Region (1): Northside Timber Sale, Lolo National Forest

The Northside Timber Sale was carried-out on the Missoula Ranger District of the Lolo National Forest in Montana. Over time the treatment unit, which is located within an urban interface area, had become "out-of-balance" ecologically. As a result, the area faced substantial risk from catastrophic wildfire. The primary objective of the project was to reduce this risk. Secondary objectives were to improve winter range and elk forage, and encourage ponderosa pine growth. For TSPIRS reporting purposes, the project was coded as FS10 – 100 percent; which means that the undertaking was deemed to be a forest stewardship purpose sale that would mainly benefit ecosystem health.

[3] In reality, such has never been the case – even in the past when the Agency's focus was on making so-called "timber commodity" purpose sales. When the Forest Service sells timber, even for commodity purposes, it does not do so to help ensure that the forest products industries can operate at a profit, it does so to fulfill its legislative mandate "to furnish a continuous supply of timber for the use and necessities of the citizens of the United States." (Organic Administration Act of June 4, 1897) In a capitalistic economy such as ours, where the means of production have, for the most part, been vested in the private sector, working through the forest products industries is the only way that the Agency can effectively respond to its charge from Congress.

A contract to implement the project was awarded on October 2, 1996. Under the terms of this contract, timber harvest operations, primarily commercial thinning and understory removal, were to be conducted on some 1,500 acres. Following harvesting, the treated acres were to be burned. It was estimated that 5.3 MMBF of sawtimber would be produced. Timber harvesting was selected as the preferred method of treatment because the ID (Interdisciplinary) team responsible for planning the project concluded that this tool would most completely fulfill the objectives set-forth in statement of purpose and need of the governing Environmental Assessment (EA). Additionally, the net cost per acre treated was estimated to range from $65 to $159/acre for the timber sale alternatives as compared to $220/acre for the no harvest option.

A variety of measures were employed to prevent and/or mitigate the potential undesirable side effects of project's timber harvesting activities. Helicopter yarding was employed. Streamside buffer zones were established, and a temporary bridge was used to cross La Valle Creek. Log haul schedules were structured to minimize watershed, wildlife, fishery, ecosystem and social impacts. Steps were taken to prevent and/or control the spread of noxious weeds. Lastly, unneeded roads were decommissioned at the end of the project.

The project had been controversial during the planning stage, but eventually received widespread public support. Only one appeal was received from local environmental groups. During FY 1998 a number of field trips were held for adjacent residents, the media, and members of the local Chamber of Commerce.

Region (2): Big Creek Lakes Campground Vegetation Management Project, Medicine Bow/Routt National Forest

The Big Creek Lakes Campground Vegetation Management Project was carried-out on the Parks Ranger District of the Medicine Bow/Routt National Forest in Colorado. The western portion of the Big Creek Lakes Campground was surrounded by a stand that included an overstory of mature lodgepole pine and an understory of subalpine fir and lodgepole pine. Over time, the overstory lodgepole pine had become severely infested with dwarf mistletoe – which was spreading to the pine understory. These conditions were resulting in a high rate of tree mortality and top die-back which, in turn, was creating hazardous campground conditions. Since 1994 the Forest Service had been removing between 110 and 145 hazard trees each year. Even this rate of cutting was insufficient to guarantee the health of the stands and ensure the long-term viability of the campground. Complicating the situation, the stands surrounding the eastern portion of the campground were pole-sized lodgepole pine that was seriously overstocked. These overcrowded conditions were favoring the spread of the dwarf mistletoe infestation, and also accentuating the risks of catastrophic wildfire.

The Big Creek Lakes Campground Vegetation Management Project was undertaken primarily to ensure the long-term viability of the campground and to guarantee the safety of recreation users. A secondary objective was to improve forest health by reducing the

risks of disease and catastrophic wildfire. For TSPIRS reporting purposes, the project was coded as FS10 – 100 percent; which means that the undertaking was deemed to be a forest stewardship purpose sale that would benefit mainly ecosystem health.

A contract to implement the project was awarded on August 31, 1998. Under the terms of this contract, some 30 acres of the stands surrounding the western portion of the campground were to be harvested using individual tree selection. The prescription mandated removal of all lodgepole pine that was heavily infested with dwarf mistletoe, and all overstory trees that were near campsites or deemed to be subject to windthrow. The overstocked stands surrounding the eastern portion of the campground were to be thinned to improve forest health. The total volume of timber harvested was approximately 510 CCF (hundreds of cubic feet). Roughly 95 percent of this material was live sawtimber, the balance was dead.

A timber sale was deemed to be the only viable option for accomplishing the objectives of this project. Continuing to remove 100 to 150 hazard trees per year was not significantly improving public safety, or doing anything to address the existing forest health concerns. Using a timber sale enabled the Forest Service to collect KV and BD funds which were used to manage the understory and treat the logging slash. A financial analysis of the "Proposed Action" and "No Action" alternatives showed the former to have a much better present net value (PNV) assuming a 4 percent discount rate.

Measures used to prevent and/or mitigate the potential undesirable side effects of the project's timber harvesting activities included the following: directional felling, mandating the use of rubber-tired skidders, requiring that the front-end of logs be suspended during skidding, using campground roads as skid trails, precluding whole tree skidding, and requiring revegetation of the skid trails and landings at the close of the operation.

Very little controversy surrounded implementation of the project. No appeals or lawsuits occurred. The public was concerned about the way the campground appeared immediately following treatment, but these concerns evaporated once the slash treatment and cleanup work was completed.

Region (3): Pratt Canyon Timber Sale, Kaibab National Forest

The Pratt Canyon Timber Sale was carried-out on the North Kaibab Ranger District of the Kaibab National Forest in Arizona. This District has the densest population of Northern Goshawks in the United States. The report of the Northern Goshawk Scientific Committee – *Management Recommendations for the Northern Goshawk in the Southwestern United States (MRNG)* – identified 6 age classes of vegetation that were needed to provide nesting and foraging habitats for the goshawk and its prey base. Unfortunately, over time the structure of the stands within the project area had become unbalanced – there was a preponderance of trees in the larger size classes. This was adversely affecting populations of some of the goshawk's principal prey species.

The primary objective of the Pratt Canyon Timber Sale was to improve habitat for both goshawks and their prey species. Towards this end, timber harvest activities sought to create a condition where approximately 40 percent of the treatment area would be dominated by groups of large trees (18"+). Secondary objectives were to reduce the risk of catastrophic wildfire, reduce the acreage infected with dwarf mistletoe, reduce the threat from other insect and disease pests, increase the acreage of aspen, and provide additional watering opportunities for animals. Treatments implemented during the course of the project included the following: 1,188 acres harvested using group selection, 597 acres of prescribed burning, 200 acres of precommercial thinning, 94 acres of fuelbreak maintenance, 30 acres of meadow maintenance (removal of encroaching conifers), 20 acres of artificial regeneration, and 15 acres of aspen regeneration. Timber outputs included 4.53 MMBF of ponderosa pine, Douglas-fir and white fir sawtimber, and 777 MBF of pulpwood.

Because of the preponderance of larger-sized trees, a timber sale was deemed to be the least net cost method of achieving the desired results. A financial analysis indicated that the Benefit/Cost Ratio for the project would be approximately 2.2. To have used cut-&-leave to attain the desired results would have cost an estimated $106,000. Furthermore, the merchantable material left in the woods would have created an unacceptable fuels situation. Finally, had it used cut-&-leave the government would have forgone the $250,000 in revenue that was earned from sale of the timber, and would have had to pay for $121,000 in site improvements that were funded with the use of KV funds collected from timber purchasers.

A variety of measures were employed to prevent and/or mitigate the potential undesirable side effects of the project's harvesting operations. Most significantly, the timing of harvest activities was controlled to minimize disturbance of the goshawks. Other measures that were adopted included the following: placing restrictions on the location of roads and skid trails, specifying the conditions under which certain roads could be used for haul purposes, and retaining groups of mature aspen trees with existing cavities or the potential for them.

This project was quite controversial at the time it was proposed. An appeal was filed, but the decision of the field managers was upheld by the Regional Forester. There continues to be controversy surrounding the application of the recommendations of the Northern Goshawk Scientific Committee, but the results of this project appear to have been accepted.

Region (4): Prince John Timber Sale, Boise National Forest

The Prince John Timber Sale was carried-out on the Cascade Ranger District of the Boise National Forest in Idaho. Analyses begun in 1994 had shown that within the treatment area, low elevation Douglas fir, grand fir, and ponderosa pine stands were outside their historic range of variability in terms of both basal area per acre and seral species

composition. Due to a lack of frequent low intensity fires and unchecked regeneration of climax species, the basal area on some sites was a high as 174 square feet per acre – this is in contrast to the historic range which varied from 77 to 115 square feet per acre. The condition of these stands favored the occurrence of large stand-replacing fires, which had the potential to severely damage soil productivity, wildlife and fisheries habitat, and other resource values. Additionally, a number of roads within the project area, most of which had been built prior to 1950 and had been located immediately adjacent to streams, were contributing substantial amounts of sediment to perennial streams, thereby degrading riparian conditions and aquatic habitat.

The primary objectives of the project as articulated in the "purpose and needs" section of the final environmental impact statement were: 1) to salvage dead and imminently dead trees from the area; 2) to achieve the desired future condition of a healthy diverse forest in which important visual resource values are sustained; 3) to improve big game forage habitat; 4) to reduce natural fuel loads; 5) to reduce sediment delivery from existing roads while still providing access to heavily used recreation sites; and 6) to provide sawlogs and other wood products to help sustain local economies and meet the nation's demand for wood. For TSPIRS reporting purposes the sale was coded as FS10 – 100 percent; which means that the undertaking was deemed to be a forest stewardship purpose sale that would mainly benefit ecosystem health.

A contract to implement the project was awarded on September 22, 1997. Expectations are that the project will not be completed until September of 2004. By the time the project is completed it is estimated that 14.7 MMBF of timber will have been harvested from approximately 2,018 acres. This volume is to be removed using a variety of silvicultural prescriptions including clearcut with reserve trees, irregular shelterwood, group selection, and individual tree selection. Some 10.6 miles of existing road will be reconstructed – and 5.5 miles, most of which lies immediately adjacent to perennial streams, will be obliterated. Finally, prescribed fire will be used to improve big game forage, thin overcrowded plantations, and reduce natural fuel loads on some 1,307 acres.

Because much of the vegetation needing treatment was of merchantable size, a timber sale was deemed to be the prudent means of attaining the stated project objectives. An economic analysis prepared as part of the FEIS suggested that the project would return $1.05 for every dollar spent preparing and administering the sale. Because of a drastic upswing in market values, the high bid was such that the project will actually return about $2.00 for every dollar spent on sale preparation and administration. Sale area improvements costing over $166,000 were carried-out using KV funds collected from the timber purchaser. These improvements were not undertaken to mitigate timber sale effects, but to achieve other desired resource objectives –e.g., precommercial thinning, dwarf mistletoe control, prescribed fire for wildlife, and streamside and gully stabilization.

In addition to the normal forest plan standards, the interdisciplinary (ID) team that designed the project imposed a wide array of other constraints to mitigate the potential adverse impacts of the project on such things as visual values, the residual vegetation,

wildlife and fisheries resources, air quality, water quality, and soil productivity. Representative of the specific measures used were the following: using a Landscape Architect to layout unit boundaries and decide on marking prescriptions; retaining a certain number of "snags" per acre for use by wildlife; leaving "buffer zones" of specified widths around streams, ponds, lakes, reservoirs, and wetland areas; leaving a certain amount of woody material per acre to maintain soil productivity; and requiring hydromulching and seeding of cut and fill slopes, landings, and skid trails.

The project was not without controversy at the time that it was proposed. The Regional Office received three administrative appeals. Two were dismissed because they failed to meet the content requirements of an appeal; the third proceeded through the appeals process and the decision of the field manager's was upheld by the Regional Forester. Since implementation, the project has been cited as a good example of how timber harvesting can be used to improve forest health and reduce chronic sedimentation sources while simultaneously providing wood products to help meet market needs.

Region (5): "Chopsticks" Small Diameter Demonstration Project, Shasta-Trinity National Forest

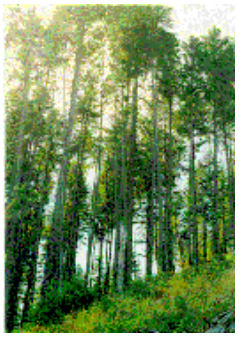
The "Chopsticks" Small Diameter Demonstration Project was carried-out on the Hayfork Ranger District of the Shasta-Trinity National Forest in California. This was not a typical timber sale, or even a typical stewardship purpose sale – but the project was intended to provide information that could be extremely useful in terms of addressing an important stewardship need. The Chopsticks project entailed removing suppressed and damaged understory trees from 39 acres of mixed conifer/Douglas fir forest in the Klamath Mountains area. The project's primary resource management objective was to reduce overstocking and thereby improve the health and vigor of the residual stand (Figure 1); an important secondary objective was to evaluate the economics of a mobile yarder that had been developed to provide a means of efficiently thinning dense stands of small sized trees – i.e., trees from 3.5 to 10 inches in diameter. At present a significant acreage of National Forest land is overstocked, principally by small diameter trees of little or no commercial value. This overstocking elevates the risk of resource value losses due to wildfire, insects, and disease, and may adversely impact wildlife habitat as well.

The Chopsticks project was implemented under an administrative use agreement approved by the Regional Forester. All harvesting activities were carried-out during the period from May through November of 1997. Approximately 170 MBF of sawtimber-sized material was removed, and 20 MBF of poles. Timber harvesting was used because it represented the only practical means of achieving the project objectives. The stocking of the stands being treated was so dense that the use of prescribed fire was not a viable option. By issuing an administrative free use permit for the timber as opposed to utilizing a service contract, the government saved anywhere from $200 to $400 per acre.

(Before)

(After)

(Before)



(After)

Figure (1): Matched Photos Showing "Before" and "After" Treatment Conditions Associated With the *Chopsticks Small Diameter Utilization Project* Implemented on the Shasta-Trinity National Forest in California.

The mobile yarder that was tested represents a relatively "low-impact" method of thinning small-diameter trees from dense, over-crowded stands. Nonetheless, a number of measures were employed to mitigate the potential undesirable effects of the harvesting operations. For one thing, cable corridors were flagged in advance of felling and yarding. For another thing, extra care was exercised during yarding to protect the residual stand.

The project was strongly supported by a broad array of local community groups. The Watershed Research and Training Center in Hayfork was a key partner. Other cooperators included Trinity County, Trinity Occupational Training, Jefferson State Forest Products, and the Forest Products Laboratory.

Region (6): Tower Timber Sale, Gifford Pinchot National Forest

The Tower Timber Sale was carried-out on the Cowlitz Valley Ranger District of the Gifford Pinchot National Forest in Washington. All the harvest units were 35 to 40 year old plantations dominated by Douglas fir. The stands, which typically had from 200 to 300 trees per acre, were at their maximum stocking density. Canopy closure was complete and diameter growth had slowed to a minimum. Because of the canopy closure, understory vegetation was minimal. Treatment was deemed necessary to accelerate growth and development towards the late successional conditions described in the Northwest Forest Plan. The principal management objectives of the project were: 1) to accelerate development of late-seral conditions (large dominant tress, multiple canopy layering, diversity of understory species, and large snags/course woody debris on the forest floor) in young stands less than 80 years old; and 2) to restore structural complexity and biological diversity in forests and streams where past wildfires and management activities had reduced diversity. (Figure 2) For TSPIRS reporting purposes, the project was coded as FS30 – 100 percent; which means that the undertaking was deemed to be a forest stewardship purpose sale that would mainly benefit wildlife.

Harvesting began in the summer of 1998. In total, some 207 acres were to be commercially thinned thereby yielding 1.3 MMBF of sawtimber and 30 MBF of non-sawtimber. A timber sale was deemed to be the only practical and feasible way of attaining the established management objectives. Leaving the stands untreated would have doubled or tripled the time required for the units to develop into the desired conditions. Additionally, using a timber sale made it possible to collect KV funds from the timber purchaser. These funds were used to precommercially thin six young plantations (10 to 20 years old) adjacent to the harvest units.

A wide array of measures was employed to mitigate the potential undesirable side effects of the timber harvesting operations. These included the following: leaving no-cut buffers alone creeks and roads; predesignating skid trail locations to minimize compaction; restricting skidding activities during certain times of the year to minimize compaction;

(Before)

(After)

Figure (2): Unmatched Photos Showing "Before" and "After" Treatment Conditions Associated With the *Tower Timber Sale* Implemented on the Gifford Pinchot National Forest in Oregon.