INTEGRATING PRODUCTIVITY WITH CONTINUOUS IMPROVEMENT VIA THE ISO 14001 ENVIRONMENTAL MANAGEMENT SYSTEM

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ABSTRACT.—International Organization for Standardization (ISO) 14001 is an internationally recognized environmental management standard with elements of risk analysis, written procedures, monitoring, auditing, and continuous improvement. UPM-Kymmene (Helsinki, Finland) and its group of wood-based industries, including Blandin Paper Company, has embraced this system as a means of satisfying customer and stakeholder requests for assurance of environmentally sound operations. Blandin Forestry, owning 190,000+ acres of northern Minnesota forest land, has undertaken several significant strategic steps that will improve our forest's health and long-term productivity. Harvest technologies identified in the state's generic environmental impact study have been adopted as part of the suite of solutions to our sub-optimal forest growth. Identification of acreage lost to roads, landings, slash piles, and skid trails has led to measures designed to reduce these by over 50%. Biodiversity issues are beginning to be addressed through sampling and forester education. Design and layout of all forest management activities is undergoing review, and specific written procedures and checklists will guide both forestry staff and the contractors who implement our plans. Decisions about the post-harvest fate of specific sites will be better made with new layers in our GIS, including plant community information organized after Kotar's Habitat Type Classification System. The continuous improvement requirement of the ISO 14001 standard drives most of the actions undertaken above, and the audit and monitoring components help ensure that quality work is being done by current staff and our successors. Public input and involvement gives an added element of credibility to these efforts.

ISO 14001—WHAT IS IT?

The International Organization for Standardization (ISO) is a worldwide federation founded in 1947 to promote the development of international manufacturing, trade, and communication standards. Member bodies from over 110 countries, including the U.S. American National Standards Institute (ANSI) receive input from government, industry, and others before developing a standard.

All standards developed by ISO are voluntary, but industries and countries often adopt ISO standards as requirements for doing business, making them virtually mandatory. ISO 14000 is a series of generic standards that provide a business with the structure for managing environmental impacts. Companies register to ISO 14001, the specification standard that is a model for an environmental management system.

Components include:

- Environmental policy, including commitment to prevent pollution
- Performance goals: objectives and targets, taking into account
    - Legal and other requirements
    - Environmental aspects of activities, products, and services
    - Views of interested parties
    - Business, technical, and economic requirements
- Environmental programs: action plan to meet objectives
- Roles and responsibilities
- Training and awareness
- Communication—internal and external
- Documentation of the system, including procedures or operational controls
- Monitoring, measurement, and recordkeeping
- Procedures for corrective and preventive action
- Environmental Management System (EMS) audits
- Management reviews

HOW DOES THE ISO 14001 SYSTEM HELP ACHIEVE GAINS IN PRODUCTIVITY?

Operational procedures, planning procedures, and continuous improvement can help improve the overall productivity of an industrial forest like Blandin's.

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When possible, operational procedures are written to handle the perceived risks. In cases where we lack sufficient knowledge or cannot immediately install the proper systems, the risk is handled by setting a new objective and target for completion. The action plans to implement these objectives are termed environmental programs. Environmental aspects determined to have somewhat lesser priority are kept in the database for future attention.

Written Procedures

Although many organizations rely on manuals and written documentation to carry out specific tasks or to organize complex initiatives, private and industrial forest management entities tend to minimize the paperwork whenever possible. In a fast-paced world of constant change, there is some advantage to this; however, the downside is that years of expertise and experience are sometimes lost when people leave the organization. Another hazard is that of inconsistent application of "best practices."

The ISO 14001 standard requires that written methods, or "procedures," be developed to take into account not only the best workable practices, but also legal and other requirements such as codes of conduct. Views of interested parties are also to be assimilated into the planning process, so it is incumbent upon the organization to find a way to gauge public opinion.

Procedures are then distributed to all appropriate parties, including individual contractors' employees, who may receive only the work instructions portion. Training is provided at the same time, and refresher training is offered periodically to keep everyone current. Hard copies of procedures are considered "uncontrolled documents," and must be refreshed when new information is added.

Monitoring and Measurements

An important component of the ISO standard is field monitoring and measurement of practices. This is to ensure that procedures are followed, to discover any previously unknown problem areas, and to help rate contractor performance. Results are also used to summarize overall environmental performance.

During monitoring, any departures from procedural standards are picked up and counted as "non-conformances." The ISO standard stipulates that there be a procedure to deal with these. First, the problem itself is mitigated and fixed. Second, a method is devised to help prevent recurrence of the problem, whether by additional training, altering a procedure, or establishing a new objective and target.

BLANDIN FORESTRY EXAMPLES

Improved Harvest Technologies Reduce Site Damage, Increase Fertility, and Curtail Productive Acreage Losses

In the Minnesota Generic Environmental Impact Statement on Timber Harvesting (Jaakko Poyry 1993), there are several references to the need for changes in harvesting systems to help mitigate negative impacts from logging practices. Blandin Forestry decided to act on these recommendations, and in 1995 organized two equipment demonstrations on our forest, which resulted in several logging contractors eventually purchasing Scandinavian style cut-to-length logging systems.

Loggers who use these shortwood processors and forwarding systems have several advantages:

- soil damage is reduced when machinery travels on top of slash generated in the delimbing cycle
- operations can continue during wetter than normal conditions in the forest, due to low ground pressure and the slash mat generated by the harvester
- slash is spread over the entire logging site, thereby leaving nurients on site
- smaller system of roads—in fact sometimes no additional roads, because forwarder can carry logs up to 4,000 or more feet from site to roadside
- reduced size landings, or no landings at all—logs loaded onto roadside or directly onto trucks
- new options for thinning in plantations and native overstocked forests—adding growth potential

Tracking and Reducing Loss of Productive Acreage Due to Logging Activities

From a fiber growth point of view, loss of productive acreage happens whenever a new permanent logging road is built, a landing site remains free of forest cover, or slash piles accumulate to a depth that precludes tree regeneration. More subtle losses occur from compaction of skidding routes and other machine trafficking of sites.

Last year, Blandin Forestry did a pilot study looking back at a representative sample of sites that had been logged 3 1/2 to 4 years earlier. A contractor was retained who flew appropriate-scale aerial photographs and then evaluated them for apparent site loss due to roads, landings, slash piles, and reduced density reproduction. Ground checking confirmed the figures, and in fact increased the loss figure slightly. In summary, we found that about 5.5% of the land was no longer growing trees, while another 5% was very low in stocking density and a further 6.5% appeared to be significantly affected—perhaps at half the density of the remaining acreage.

Armed with this baseline data and new knowledge, we have now set a short-term goal for reducing the roads, landings, and slash pile acreage to 2% or less by the year 2001. Incorporating this type of monitoring, measurement, and target for improvement into our management system is a clear example of the way the environmental management system can achieve gains in productivity. A very similar site monitoring approach is being used by the foresters who work in Weyerhaeuser's Alabama units (Leist 1998).

Logged Area Analysis Monitoring Reduces Waste

Since at least 1983, we have tracked samples of our logging sites to determine the level of wasted wood left on logging sites. The amount of recoverable fiber was high in the early years in part because of poor markets for the hardwoods not used in our pulpmill or waferboard plant. Some of the worst cases documented as much as 10-12 cords per acre left in the woods; today the figure is less than 2 cords per acre. Given the high price of stumpage, we feel this is still excessive and have a goal to achieve a level of less than 0.5 cord per acre. Here again, the ISO standards of continuous improvement, measuring and monitoring, and setting objectives and targets form a solid basis for successful implementation of this ongoing project.

Habitat Type Classification Assists in Post-Harvest Regeneration Decision

From the fairly typical clearfelling regeneration methods employed in the aspen cover types in northern Minnesota, Blandin desires to explore alternatives that may enhance multiple environmental values and at the same time boost fiber production or economic efficiency. A few examples of these are:

- partial cuts in stands that can produce a reliable conifer seed source
- conversion to spruce or pine on soils where these conifers will outperform aspen
- precommercial thinning in aspen and conifer cover types where overstocking results in excessive fiber loss due to tree mortality.

Kotar's Habitat Type classification (Kotar 1988) adds another dimension to the forester's knowledge base. Previously, we used soil types, forest timber types, site index, access, drainage, slope, etc. when making decisions about whether or not to retain the existing forest cover type or to convert to another species. The Habitat Types now being developed incorporate all factors that contribute to plant growth into a unique barometer of site quality and productivity potential. Our GIS will incorporate the new Habitat Type information with existing soils, timber, water, and other layers to enable better decisions by foresters. Another benefit of using this system is the added familiarity with forest floor biota gained during survey work. Foresters who may have focused exclusively on timber stands now see more of the ecosystem components, and thereby gain a greater sense of the biodiversity effects of their management decisions.

Public Opinion Matters

Finally, ISO has a requirement to take into account the views of interested parties, or stakeholders, when forming targets and objectives, as well as several communications expectations. We have plans to institute a consultative group as part of our information gathering methodology. ISO's auditing and reporting elements include the concept of third party verification—meaning people outside the organization are invited to look carefully at our systems and practices to see that we are doing what we say we will do.

This type of activity tends to foster public trust and lends credibility to our planning and operations. In today's political climate, virtually all natural resources management is subject to intense public scrutiny. We feel it is essential to work with public perceptions and gather public input in order to retain the "right" to operate. Loss of productivity due to public pressure to stop managing could be the largest loss of all.

LITERATURE CITED

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