



EVALUATION OF THE MULTIPLE-USE RESEARCH PROGRAM OF THE FINNISH FOREST RESEARCH INSTITUTE

by

METSÄNTUTKIMUSLAITOS
Kirjasto

B.L. Driver and George L. Peterson

METSÄNTUTKIMUSLAITOS
Kirjasto

Metsäntutkimuslaitoksen tiedonantoja 438
The Finnish Forest Research Institute. Research Papers 438

**EVALUATION OF THE MULTIPLE-USE
RESEARCH PROGRAM OF THE
FINNISH FOREST RESEARCH INSTITUTE**

by

B.L. Driver and George L. Peterson
USDA Forest Service
Rocky Mountain Forest and Range Experiment Station
Fort Collins, Colorado, USA

Joensuu Research Station 1992
Department of Forest Resources

METSÄNTUTKIMUSLAITOKSEN TIEDONANTOJA
The Finnish Forest Research Institute. Research Papers

Driver, B.L. and Peterson, George L. 1992. Evaluation of the multiple-use research program of the Finnish Forest Research Institute. Metsäntutkimuslaitoksen tiedonantoja 438. 71 s. The Finnish Forest Research Institute, Research Papers 438. 71 p. ISBN 951-40-1259-3, ISSN 0358-4283.

Publisher: The Finnish Forest Research Institute. Multiple-use research program. Accepted for publication at the Finnish Forest Research Institute by Prof. Aarne Reunala, research director.

Distributor: The Finnish Forest Research Institute, Joensuu Research Station, P.O. Box 68, 80101 Joensuu, Finland.

The front cover drawings were done by Ms. Seija Sulonen, Joensuu Research Station.
PunaMusta Joensuu 1992

TABLE OF CONTENTS

- 1.0 EXECUTIVE SUMMARY
(1.0 recommendations)
- 2.0 INTRODUCTION
 - 2.1 Purpose of the Evaluation
 - 2.2 Evaluation Procedures
- 3.0 BACKGROUND INFORMATION
 - 3.1 Finnish Context
 - 3.2 Forestry in Finland
 - 3.3 The FFRI
 - 3.4 MU Research in Finland and the FFRI
 - 3.4.1 History
 - 3.4.2 Organization of MU Research in the FFRI
 - 3.5 MU Forestry Education in Finland
- 4.0 GENERAL EVALUATION OF THE MU RESEARCH STUDIES
 - 4.1 Organizational Structure
 - 4.2 Research Planning
 - 4.3 Consolidation of Scientists and Centers of Excellence
 - 4.4 Funding and Other Resources
 - 4.5 Recognition
 - 4.6 Education
 - 4.7 Technology Transfer
 - 4.8 Responsiveness of the FFRI to Social Pressures
 - 4.9 Research Areas Not Now Covered or Needing Expansion
- 5.0 A CLOSING STATEMENT
 - 5.1 REFERENCES
- Appendix I The Evaluators
- Appendix 2 The New Perspectives Program of the USDA Forest Service
- Appendix 3 Ecosystem Management of National Forests and Grasslands in the United States

PREFACE

We appreciated the opportunity to visit Finland and to make this evaluation. The information package put together for us, while rather intimidating in its volume and scope, was invaluable. We recognize the time and effort its preparation required. We are grateful to all who gave of their time and showed us many special courtesies. We express special thanks to Dr. Aarne Reunala for coordinating the evaluation and serving as our primary host. The heart warming Finnish saunas were most delightful.

This report is written in a first person, active style rather than the third person, passive mode which is typically used in scientific writing. We use that style because it was more adaptive when we had to make subjective judgments (as requested by the Finnish Forest Research Institute), it is more user-friendly, and easier to read.

We hope this evaluation helps the Finnish Forest Research Institute improve and advance its program of multiple-use research.

B.L.D.

G.L.P.

1.0 EXECUTIVE SUMMARY

In 1990, the Board of the Finnish Forest Research Institute (FFRI) formally approved a program of research on multiple use (MU), making that area of inquiry one of the five major priorities for research in the Institute. In 1991, the FFRI asked us to evaluate the MU research program because it wanted a critique by scientists with international perspectives and experience in nontimber research.

In August 1991, we spent two weeks in Finland, during which time we formally interviewed 29 people engaged in MU research at the FFRI or who worked for other institutions interested in the MU research of the FFRI. We spent time in Helsinki, Joensuu, and Rovaniemi as a part of the evaluation. In addition we participated in an IUFRO excursion that included a one-week study tour of parts of Finland. The contacts made, and areas visited, on that excursion provided additional information for our evaluation. The people we met treated us very kindly and were very helpful.

Overall, we were very favorably impressed with the FFRI as a whole, and with its personnel, facilities, organization, and programs of research. The FFRI is an international leader in many areas of forest research, including MU. Finnish scientists are recognized internationally, along with scientists from other Scandinavian countries, the United States, and the United Kingdom, as pioneers in the areas of amenity resource valuation and multiple use forestry. Participation and leadership by FFRI scientists, including members of the MU program, in the International Union of Forestry Research Organizations is outstanding.

Our evaluation recognizes strengths and identifies opportunities to strengthen MU research at the FFRI. The specific findings and recommendations are summarized below and elaborated in Section 4.0 of this report. The recommendations are not arranged in any order of priority.

- Expand and Strengthen the MU Research Program: The FFRI should expand and strengthen the program of MU research. MU forestry is a rapidly growing concern throughout the world and is of critical importance in Finland. Commercial forest products make a major contribution to national and local income, but the people also hold strong traditional values that are deeply rooted in their personal and cultural relationship to the forest. Forest recreation, gathering forest products (berries, mushrooms, etc.) for personal use, spiritual kinship with the forest, and other amenity values are the heart and soul of the Finnish people. The challenge facing MU research is to learn how to preserve and enhance these amenity values, while at the same time strengthening the forest-centered economic base and maintaining ecological vitality. It is a formidable challenge, worthy of the pioneering spirit of the FFRI.
- Broaden and Integrate the Multiple-Use Vision: As presently organized in the FFRI, the MU research program appears to be a collection of worthwhile but independent studies of several nontimber forest products. From the North American perspective, we see the multiple-use research and management problem in a different way. Our concept of multiple use includes timber and

nontimber forest uses and products and implies integrated joint production of several products from a given tract of land. A program of research on MU should include both independent study of nontimber forest products and study of the problems of joint production. Because of the economic importance of wood products in Finland, study of joint production must include timber and nontimber uses of forest land.

- MU Research Planning: We see an opportunity to strengthen the FFRI MU research program through more systematic and effective research planning. This planning process should include a standard/uniform system for development, in-house review, and formal approval of: (1) a mission statement that defines and justifies the research problems assigned to the MU program; (2) problem analyses that review the state of knowledge in each of the assigned problem areas, identify and prioritize specific studies that will contribute to problem solution, and detail resources (personnel funding, equipment, etc.) needed to complete each study; and (3) detailed study plans for each study undertaken. Among other things, a study plan develops the experimental design, including hypotheses to be tested, experimental procedures, and analytical methods.

The mission statement, problem analyses, and study plans should be part of a formalized planning process that includes peer review and executive approval by administrative officers. Until approved, such documents constitute proposals to expend FFRI (or external) funds, and when approved, they become

research plans. Of course, planning must be a continuing process of review and amendment as required by new knowledge or changed circumstances.

- Team Building: Many of the FFRI MU scientists are scattered among different locations in Finland and are isolated from like-minded peers. Geographic consolidation of these scientists into teams that address particular research topics will facilitate every day face-to-face interaction that strengthens their efforts through mutual support and enhanced communication. We recommend creation of "Centers of Excellence" for particularly important areas of research, such as outdoor recreation (including aesthetic appreciation and landscape management), in geographic proximity to, and cooperation with, expertise in local colleges and universities.
- Funding: At present, the MU research team includes only 12 of the 200 scientists of FFRI, and about one half of these 12 are on part-time and/or temporary appointments. This modest level of activity needs to be expanded. MU forestry in Finland and Finland's role in international forestry is sufficiently important to justify a significantly larger level of focused research effort. There is a need for an increased level of base funding to expand the team of qualified MU scientists and to provide the resources these scientists need to accomplish their research assignments.
- Recognition: Some of the most important MU research involves social, economic, and behavioral science. In general, more traditional forest scientists tend to view these areas of research incorrectly as "soft sciences" that are less prestigious or less legitimate than the so-called "hard" scientific disciplines that

focus on biological, physical, and silvicultural phenomena. This problem exists world-wide, not just in Finland. The FFRI administration must do everything possible to support, encourage, elevate, and legitimize the stature of MU science, including research in the social, economic, and behavioral sciences. These efforts should include special recognition and incentives for MU scientists. We recommend designation of a pool of research funds to be awarded competitively for research proposed by MU scientists, an annual "Outstanding MU Research Publication Award" that includes public recognition and a monetary bonus, and promotion of foreign travel for highly productive MU scientists. MU scientists who publish in refereed international journals should receive special recognition and additional resources for their research.

- Education: Several of the MU scientists are pursuing advanced academic degrees for which they receive FFRI support and/or are using FFRI studies as theses or dissertations. It is highly commendable that the FFRI provides such educational opportunity. MU scientists who are working on these programs should be encouraged and stimulated by the FFRI administration, however, to accelerate their efforts and complete their academic programs in a timely manner. Scientists should not be allowed to delay completion of academic programs indefinitely, and incentives for timely completion must be strengthened, including withdrawal of FFRI support when appropriate. Our experience with graduate students in U.S. institutions of higher education has shown that those students who become the best scientists are highly motivated

to complete their education and get on with their "quest" for knowledge. The FFRI should provide student scientists with sufficient resources, release time, and a framework of strong incentives for timely completion.

Opportunities exist for the FFRI to help promote academic training in MU forest management within forestry faculties in Finland. We recommend that FFRI become more pro-active in this area.

- Technology Transfer: Some of the MU scientists work closely with users of their research results to help transfer this knowledge into application. More needs to be done, however. The FFRI should encourage technology transfer (TT), for example, by issuing a periodic newsletter on MU research and by giving more recognition for TT in the internal system of rewards. The MU newsletter should be written for the FFRI's "clients" outside the realm of research (e.g., employees with the National Board of Forestry, the Ministry of the Environment, the news media, conservation organizations, and the public).
- Responsiveness to the Public: Quite a few of the people we interviewed expressed the opinion that FFRI had not been adequately responsive to social issues and trends in the past. We have no evidence to confirm whether or not these perceptions reflect reality. Nevertheless, the perceptions exist to some degree. The issue needs more study, perhaps by an objective outside review panel.
- New Areas of Research: We recommend additional MU research in the following areas: preservation and promotion of biodiversity; resource-based international tourism; environmental education related to MU forestry;

private landowners' attitudes about, and behaviors pertinent to, MU forestry; and the magnitude and value of hunting and fishing on forested lands. More research is also needed on the values of nontimber products.

2.0 INTRODUCTION

2.1 Purpose of the Evaluation

Although multiple-use (MU) forestry research has been done at the Finnish Forest Research Institute (FFRI) for several decades, it was not until 1990 that the Board of the Institute officially created a Multiple-Use Research Program. Because the Institute was interested in an early outside appraisal of that program, and one made from an international perspective, we were asked to make the evaluation reported here.¹

The objectives assigned us by the Institute were to evaluate

- The quality of specific MU research projects.
- Whether existing research areas are being covered adequately and do new areas need to be added?
- The organization, conceptual orientation, and administration of the MU research program.
- How, from our perspective as outside analysts, the program can be improved and made more responsive to the Institute's goals and to the societal needs of Finland.

The first three purposes of the evaluation could be handled rather objectively. The

¹ A brief description of our credentials are given in Appendix 1.

fourth one demanded more subjectivity; it required us to make cross-cultural comparisons and judgments about current issues and likely future changes in Finland (e.g., urbanization and growing concerns about environmental issues) that affect public sentiments about the practice of forestry in that country. We were asked to be candid in these "speculations." We have been, but emphasize that these perceptions are based on a three-week visit to Finland.

2.2 Evaluation Procedures

The evaluation consisted of three stages: a visit to Finland in August 1991; study of material back in the United States; and writing of the report.

The first, and most important--and enjoyable--part of our evaluation was our visit to Finland in August 1991. Driver arrived in Helsinki the morning of 12 August and Peterson the morning of 20 August. Except for weekends, both of us worked full-time on the evaluation until the evening of 24 August. During week days, most of the time was devoted to interviewing administrators and MU scientists in the FFRI and other interested professionals associated with organizations other than FFRI. Other available time during the day and in the evenings was spent reading the package of background material prepared in advance for us as well as the printed documents obtained during the interviews. That material included information about the history of forestry in Finland; agencies and institutions involved in resource and environmental management; the FFRI, its organization, objectives, and research programs; social trends and current forestry-related issues in Finland; and information on individual FFRI MU scientists,

including descriptions of their current and recent research activities and copies of their publications.

While we had only 10 days to contact people, we were able to interview formally a total of 29 professional people within and outside the FFRI in Helsinki, Joensuu, and Rovaniemi. Meetings were held not only with MU scientists of the FFRI but also with professional people outside the Institute who were interested in the Institute's multiple-use research program. These outside contacts were made in order to glean additional knowledge about FFRI's MU research and how it might be improved. A few of the interviews were quite brief, but most of them lasted from 30 minutes to several hours.

The following people were interviewed formally. They are arranged alphabetically by location where the interviews took place and whether they worked for the FFRI or not (with area of research within FFRI, or affiliation if other than FFRI in parentheses).

Helsinki: FFRI

Hytönen, Marjatta (multiple-use forest management)
 Lähde, Erkki (silviculture)
 Löfström, Irja (urban forestry)
 Parviainen, Jari (Research Director)
 Pohtila, Eljas (Director General)
 Reunala, Aarne (Communications Director and recreation)
 Risto, Savolainen (manager of FFRI research forests and reserves)
 Sievänen, Tuija (recreation)

Helsinki: Other Than FFRI

Haapanen, Antti (Head of Nature Conservation Division, Environmental Protection Department, Ministry of the Environment)
 Helminen, Matti (Chief of Nature Protection Division, Finnish National Board of Forestry)
 Joutsamo, Esko (Secretary General, Finnish Association for Nature Protection)
 Lehtinen, Ari (Department of Geography, University of Helsinki)

Leikola, Matti (Professor of Silviculture, Department of Silviculture, University of Helsinki)

Joensuu: FFRI

Kangas, Jyrki (planning decision models)
 Salo, Kauko (wild mushrooms and berries, various aspects)
 Saramäki, Jussi (Head, Joensuu Research Station)

Joensuu: Other Than FFRI

Kellomäki, Seppo (Professor of Silviculture, Faculty of Forestry, Joensuu University)
 Pukkala, Timo (Professor of Forest Management and Planning, Faculty of Forestry, Joensuu University)
 Saastamoinen, Olli (Associate Professor of Forest Economics, Faculty of Forestry, Joensuu University)

Rovaniemi: FFRI (Scientists interviewed in Rovaniemi were from the Kolari, Muhos, and Rovaniemi Research Stations)

Eeronheimo, Heikki (nature conservation)
 Hallikainen, Ville (wilderness management)
 Helle, Timo (reindeer, moose, and grouse management)
 Kortesharju, Jorma (cloudberry cultivation)
 Kubin, Eero (silviculture for lichen production)
 Naskali, Arto (economic valuation of nonmarket forest goods and services)
 Sepponen, Pentti (ecological effects of silviculture and nature conservation area management)
 Varmola, Martti (Head, Rovaniemi Research Station)

Rovaniemi: Other Than FFRI

Jokimäki, Jukka (Arctic Centre)
 Sippola, Anna-Liisa (Arctic Centre)

We appreciate the time given by these people. Many of them extended special courtesies to us, including dinners in their homes and in restaurants, weekend fishing trips, personally guided local tours, and those "heart-warming" Finnish saunas.

The two weekends of informal time spent with FFRI researchers also provided opportunity for extended informal discussions of the MU research program, as did conversations with ten FFRI scientists and other resource professionals not associated with FFRI during a two-week IUFRO (S6.01 and S6.02-04) study excursion (on forest recreation, landscape planning, nature conservation, and the economics of multiple-use forestry) in Finland, Estonia, and Leningrad (St. Petersburg). That excursion contributed to our evaluation in four ways: (1) it afforded opportunity for continued dialogue with the ten FFRI MU scientists who were either participants on, or speakers for, the excursion, (2) it provided some lapse time to reflect and then discuss some preliminary conclusions and recommendations with Aarne Reunala (our primary FFRI host and coordinator of the evaluation), who provided excellent feedback for us to analyze; (3) most of the speakers/hosts and members of the press at the places we stopped on the excursion were interested in our evaluation and provided useful information; and (4) we were able to visit additional field sites and meet professionals from different agencies and thereby learn more about the Finnish practice of forestry, the challenges being faced, and emerging issues.

Once back in the United States, much additional time was devoted to reading and re-reading the vast amount of literature collected during our visit to Finland. This continued during the drafting of the preliminary report, which was reviewed by Aarne Reunala prior to preparation of the final report.

3.0 BACKGROUND INFORMATION

This section briefly reviews the Finnish context within which this evaluation was made. Most of the information presented is known by the Finnish readers of this report, but it will inform them of the informational base used to prepare this report.

3.1 Finnish Context

Finland lies in the latitude of 60°-70° north and the longitude of 19°-31°. About one-third of its total land and water surface area of 337,000 square kilometers (130,000 square miles) is north of the Arctic Circle. Despite being so far north, the temperatures are comparatively warm because of the influence of the Gulf Stream. The land area is 305,000 square kilometers with 76 percent of it covered by forests, which is more than any other European country. Most of the land is below 400 meters in elevation. The percentage (31%) of the total land area that is in peatland is the highest in the world. About 65 percent of the land area is in private ownership. While Finland has a population of about 5.0 million people, it is the most sparsely populated country of Europe with an average of only 14.5 inhabitants per square kilometer. The population density varies considerably, with highest densities in the far south. Today, about 40 percent of the population inhabit rural areas and 60 percent live in towns and urban districts.

Finland gained its independence from Russia only in 1917 and since then has become a highly developed and modern nation. It has excellent transportation, health, medical, educational, communication, and other public services. There is a high

ownership of private cars, one of three Finns own a summer home, and 430,000 own some forest land.

Finns historically have had a deep appreciation of nature, especially their forests. This is reflected in their preservation of "every person's right," or the right of common and free access, to nature, including the right to camp on land belonging to others, the right of access to waters for boating and swimming, and the right to gather berries and mushrooms. Recent public opinion polls continue to show that a strong majority of Finns are concerned about environmental issues, and these attitudes are about of the same strength as those expressed by respondents to such surveys in other industrially developed countries. There is a "green movement" reflected in the public media, elected representatives to the different levels of government, and in platforms of political parties. This widespread environmental concern has long been reflected in national legislation.

A few examples include the 1922 Act on the Protection of Forests, 1923 Nature Conservation Act, 1973 Outdoor Recreation Act, 1976 Act on Conservation of Rare Animal Species, 1981 Act on Establishment of National Parks and Strict Nature Reserves on Certain State-Owned Land, 1987 Act on the Protection of Wild and Scenic Rivers, and the 1991 Wilderness Act. A new Ministry of the Environment was established in 1983 to integrate environmental policy into all State functions. (Sources: Ministry of Agriculture and Forestry 1985 and Organization for Economic Co-operation and Development 1988.)

3.2 Forestry In Finland

When humans first inhabited Finland thousands of years ago, the country was almost entirely covered with dark coniferous forest. From then until today, the inhabitants have depended significantly on the forests and the multiple uses made of them. In addition to meeting domestic needs of the peasants, early economically important products of the forests exchanged in local markets and in foreign trade included furs, game, tar for caulking ships, charcoal, and timber for fuel and construction. This history has nurtured a strong affinity in Finns for their forests, both symbolically and in more utilitarian ways.

Modern Finns literally are close to their forests, because forests still dominate the landscape, covering roughly 76 percent of the country. These forests, of the boreal coniferous type, are relatively uniform or characterized by a rather narrow range of tree species, many kinds of shrubs which produce highly valued wild berries, and vast expanses of lichen. Three tree species are strongly dominant and vary in composition/mix from location to location. These are Norway spruce (*Picea abies*), Scots pine (*Pinus sylvestris*) and birch (*Betula pendula* and *B. pubescens*). Of total stumpage stock, pine accounts for 45%, spruce 37%, birches 15%, and other species 3% (mostly aspen and alder). The share of pine is increasing, as regeneration techniques have encouraged the growing of this species. Most of the forests have been "economically exploited" to some degree over the centuries, so while there are old growth forests there are few, if any, virgin forests. Also, there are no truly climax deciduous species (such as beech).

The ownership of the forest land breaks down as follows: 64% private citizens, 24% the State, 8% companies, and 4% other (municipalities, etc.). Most of the 430,000 holdings of forest land by private citizens are located in southern Finland, leaving a large proportion of northern Finland in State ownership. The average size of private holdings is 37 hectares, with about 15% being 50-99 hectares and about 6% being larger than 100 hectares. Of the land owned by the State, about 1.6 million hectares are "protection areas," including strict nature reserves (150,000 HA) national parks (27 of them totalling 670,000 HA) and special peatland reserves (400,000 HA). When the first of these areas were created in the early 1920s, their administration was put under the FFRI, which now administers 60,000 hectares of protection areas. The rest of the areas are administered by the National Board of Forestry (NBF). In addition, 1.4 million hectares of special wilderness areas were created in Lapland in 1991. Of the total of 3 million hectares protected, 630,000 hectares are productive forestland on which no harvesting is allowed.

The NBF, in the Ministry of Agriculture and Forestry, was established on a temporary basis in 1851 and permanently in 1865 and is organized into regions and districts. It manages State lands under its jurisdiction including most of the protection (conservation) areas in Finland. Its mandate is to promote "...increasing timber yield and an economically profitable return. While doing this, the National Board of Forestry shall consider, apart from timber production, also other uses of the forest..." (Finnish National Board of Forestry 1988 p.1.). Historically, the NBF has had this strong primary mandate for timber production under sustained yield management. This is understandable given the longterm importance of wood products to the Finnish

economy, discussed subsequently. However, a present forest policy objective is "...making multiple use possible. Although this objective is not yet embodied in very specific measures, there is more and more determination to take environmental, recreational, and landscape factors more closely into account" (OECD 1988, p. 70). This policy is reflected in the 1992 reorganization of the NBF which created a Department of Nature Conservation.

Good forestry practice is promoted on private forest lands by two National Forestry Centres within the Ministry of Agriculture and Forestry. One, Tapio, administers 17 District Forestry Boards; and the other, Skogskultar, administers 2 District Forestry Boards. These 19 District Forestry Boards carry out practical, on-the-ground functions and are divided into 369 Forest Management Associations of local private forest land owners. These associations give advice and assistance to the owners concerning matters of forestry. About one-fourth of all silviculture and basic forestry improvements on private lands, that are supervised by the District Forest Boards through the local Associations, are financed by state government subsidies, one-fifth by state loans, and more than half financed by the forest owners through fees and service charges.

Unlike northern Finland forests, which are mostly State lands, forests in southern Finland are largely in private ownership. A difficulty of achieving wider application of the concept of MU forestry in southern Finland centers on that pattern of private land ownership there. Increasingly though these owners "...regard the forest as a source of enjoyment rather than a source of income." (OECD 1988, p. 70).

The historic and present economic importance of wood products to the Finnish economy is summarized succinctly in the OECD (1988) report as follows:

Finland started to export sawn timber in the 19th century, followed by pulp and paper derivatives from the end of that century and reconstituted wood (panels) from the mid-20th century. In the early 1960's wood and derivatives accounted for 75 percent of Finnish exports.

Since then, timber exports have continued to grow in absolute terms.... However, other sectors developed.... and the share of wood and derivatives fell to 36.8 percent of exports in 1985. [The Central Association of Finnish Forest Industries (1991) reports it was 38% in 1990]. Wood and derivative exports have a more positive [net] effect on the foreign balance sheet than the other exports have, because the wood industry needs fewer imports [as inputs to production] than many other industries.

It is essential for the Finnish forest industries to remain highly competitive worldwide; otherwise the country's balance of payments would face disaster (p. 60).

Along these same lines, the Central Association of Finnish Forest Industries (1991) stated "It would be in the interests of the national economy to diversify the structure of

our exports, but it looks as though the dependence of the Finnish national economy on the forest industry will in the 1990's increase rather than decrease" (p. 5). The same document reports that Finland's current share of the world's exports of printing and writing paper is about 25 percent and of paper and converted paper board is about 15 percent (p. 28) and that world demands for these wood products are expected to increase (p. 27), with export demands for mechanically processed wood products (logs, sawwood, plywood, and particle board) expected to be slowest.

In a nutshell, Finland remains economically dependent on its forest product export trade and probably will be for some time in the future--probably more than any other country in the world. This dependency is recognized widely in Finland. It explains why timber production has received so much emphasis in the past and today. It also poses interesting issues regarding MU management, especially achieving balance between meeting these national economic needs and other environmental goals and social objectives.

Much of the current environmental (and MU debate) in Finland centers on the consequences of past forestry practices that were implemented to maintain national economic stability and growth. First, the past practices of making large clearcuttings (restricted now to less than 20 hectares), chemical brush control, deep ploughing to promote regeneration, and preference for pine over other species in reforestations and afforestations have left noticeable impacts. One impact of particular concern to environmentalists has been the promotion of more even-aged and species monotonous stands. The arguments are that there has been a loss of species diversity and aesthetic

appeal, with the forests likened to "tree crops," much like a field of corn. Example statements in the OECD (1988) report that support this line of reasoning follows.

[Over-mature]...trees are very valuable for many species of wildlife, particularly some of the rarer invertebrates which are dependent upon very old timber dying and upon dead timber.

Modern production forests with a single age structure of trees, a single species and little structural diversity will...be detrimental to many other socio-economic aspects of the woodland resource (p. 106).

Other arguments center on the proposition that the "modern production forest" is less resilient to climatic stresses such as acid deposition and global warming.

A persuasive emerging theme is that, since the total timber growth has considerably exceeded the total drain (cut) for several years and is expected to do so in the near future, Finland can meet its economic needs to export wood products as well as meet its conservation and other MU objectives. A program for Finnish forestry in the future--Forest 2000 (developed by the Finnish Economic Council in 1983 and revised subsequently)--has set guidelines to accomplish these multiple purposes. It, too, is controversial, and time will tell how successful it will be.

3.3 The Finnish Forest Research Institute

FFRI is the central forest research organization in Finland. The Institute is a public, nonprofit research institution subordinated to the Ministry of Agriculture and

Forestry. The Institute began its activities in 1918. Its duty is to furnish research results for use by forestry policy decision-makers, those engaged in forestry and the forest industry, and Finns utilizing the forests in various ways.

The research of the Institute covers silviculture, forest ecology, technology, economics, management, timber harvesting, timber production, and other uses of the forest such as recreation. The Institute employs a permanent staff of more than 800, of whom one-fourth are researchers. Over half of the staff are employed in the eight research stations and research areas located in various parts of Finland.

The Institute has some 140,000 hectares of research forests at its disposal to ensure the continuity of long-term studies. Eighty thousand hectares of the forests are commercially managed: on these there are 20,000 experiment plots. Sixty thousand hectares are reserved for national parks and nature reserves.

The Institute publishes three types of scientific reports:

Acta Forestalia Fennica: Contains mainly research articles, (e.g., theses, intended for scientists).

Folia Forestalia: Contains research articles and interim reports on long term studies intended mainly for those engaged in the practical side of forestry.

Metsäntutkimuslaitoksen tiedonantoja: Contains preliminary results, condensed reports and seminar papers.

Current areas of environmental and forest resource research are:

1. Monitoring the state of the forests from an environmental standpoint.

2. Forest regeneration and related technology.
3. Forest technology.
4. Multiple-use forestry.
5. Forestry planning.

3.4 Multiple-Use Research in Finland and the FFRI

3.4.1 History

The last section showed that MU research was one of the five major research areas of the FFRI. That program of research was adopted formally by the Institute's Board. A sketch of the historical background for that action was provided to us by Dr. Aarne Reunala of the Institute. It follows.

- 1967: Multiple use of forests is mentioned in the Development Program of Forest Research by the Finnish Forestry Society.
- 1971: Multiple use gets mentioned in the Research Program of the State's Agricultural Forestry Board.
- 1972: Multiple use mentioned in Science Policy Program of the National Research Board.
- 1971-75: Multiple use is in the budget plans of the Forest Research Institute as "actual research topic" and as one of the priorities.
- 1975: Multiple-Use Planning Group in the Forest Research Institute produces a paper on "Multiple-Use Forestry Research Program."

- 1977: "Recreational Use of Forests in Finland," a preliminary research report (Folia Forestalia 321), by Forest Research Institute is published.
- 1980-88: A coordination group on multiple-use research within the Forest Research Institute is chaired by Prof. Eero Paavilainen.
- 1980,1983: Forest Research Institute proposes establishing Department of Multiple Use in the Institute.
- 1985: Ministry of Environment publishes a development program for outdoor recreation studies. Forest Research Institute participates.
- 1986: Modification of the mission of the FFRI by addition of "conduct research on different forest uses and protection of the environment" as tasks of the Institute.
- 1987: "Urban Forestry: A Literature Study and Research Program" is published (Folia Forestalia 693) by the Forest Research Institute.
- 1988: A new post of Special Research Officer on Multiple Use is created in the Forest Research Institute.
- 1990: The Multiple-Use Research Program begins at the Forest Research Institute, officially approved by the Board of the Institute.
- 1991: Multiple-Use Research Program evaluation by Dr. B.L. Driver and Dr. George L. Peterson of the USA.

3.4.2 Organization of MU Research In The FFRI

The words "multiple use" can be interpreted in two different ways in the context of forest research and management. One is the use of different forest areas for different purposes, or the "segregation of multiple uses." The other is "joint multiple use" of a given land area simultaneously for several different purposes or products.

It is our perception that the words "multiple use" refer to the second interpretation, that of joint production, in both Finland and North America. Within this joint production interpretation, we see two different concepts of multiple use. The first is descriptive and passive and is concerned with the capacity of a given piece of land to provide *simultaneously more than one good or service*, even though the provision of one or more of these goods or services can conflict with the provision of one or more, but not all, other goods or services the area has the capacity to produce. More technically, the production functions for these multiple products might be complementary, supplementary, or competitive (Gregory 1955). This concept of MU describes the kinds of multiple goods and services a given forest area can and does produce. As such, it says nothing about what goods and services *should* be provided. We call this first concept Descriptive Multiple Use.

The second concept is normative and puts joint MU within a managerial context by explicitly calling for decision criteria to determine which goods and services should be provided. This we will call joint MU Management, which allows for some dominant uses but requires integration of more than one type of use into management planning and plan implementation for a particular area. If only one use is allowed it is single use

or segregated multiple use, not joint MU, management, although the decision to designate a forest area for single or segregated use might derive from joint multiple-use analysis. A key point for both the Descriptive and Managerial concepts of joint MU is that a given land area jointly or simultaneously provides more than one type of good or service.

A vast array of goods and services can be produced from forest lands. The following general categories are intended to be illustrative, not exhaustive:

Wood Products: Sawtimber, pulpwood, particleboard, needles and branches for decorations, bark for yard/garden landscaping, fence posts, poles, logs for bridges, Christmas trees, stock for ornamental plantings, fuel wood, etc.

Recreational Services Excluding Hunting and Fishing: All of the vast array of specific types of recreational opportunities--to hike, camp, run, ski, ride horses, bike, drive for pleasure, study nature, gather forest products, enjoy scenic vistas, swim, climb, boat, etc.

Fish and Wildlife: Opportunities to hunt, fish, view, study, photograph, symbolically relate to wild animals, etc.

Domestic Livestock: Opportunities to graze domestic livestock such as reindeer and cattle.

Preservation-Related: Opportunities to use protected natural areas, to just know that they are protected; preservation of ecosystems, species diversity, stewardship, etc.

Ground-Level Products: Lichen for decorations, wild berries, mushrooms, etc.

Other: Climate regulating characteristics of forest stands; watershed protection that increases quantity, quality, and timing of flows of water; naval store products, tar, etc.

It is important not to lump these products too grossly, such as recreation products, because the management inputs required to produce one type of recreation opportunity (e.g., camp in a highly developed campground) can vary greatly from those required to produce another type (e.g., camp off the trail in a remote area). It is these managerial inputs that are important. Each of these products (goods or services) can be one of a mix of multiple uses, so the concepts of MU and MU management must logically include timber products, maintenance of biodiversity, and maintenance of protected areas for the appreciative off-site "user" (who never visits the protected area) in addition to the other things listed.

The FFRI MU research program seems to lack a planned and organized foundation based in the Descriptive MU or the MU Management concepts of joint MU, although some of the studies in progress do fit well in such a framework. The overall MU research program is organized along nontimber "product lines" identified as: Nature Protection, Recreation, By-Products, and Special Subjects. This situation may be a temporary result of the newness of a program that has only begun to probe into high priority areas of multiple use, or it could reflect a need for a more integrated framework of problem selection and analysis from which to commission studies. Shown below are the current studies, or areas of study, within this rather broad type-of-use taxonomy, with the scientist responsible for each study listed within parentheses.

Nature Protection

- Ecological effects of silviculture on multiple use of forests (Pentti Sepponen).
- Research of management and use in the nature conservation areas (Pentti Sepponen).

Recreation

- Feeling of safety aroused by the forest (Aarne Reunala).
- Beauty of clear cut areas (Aarne Reunala).
- Attitudes about forests of residents of rural and urban areas (Aarne Reunala).
- Outdoor recreation demand (Tuija Sievänen).
- The inventory methods of outdoor recreation (Tuija Sievänen).
- Long-distance hiking and skiing trails (Tuija Sievänen).
- Recreation and tourism study of the Koli National Park (Kauko Salo).

By-Products

- Silviculture for lichen production (Eero Kubin).
- Cultivation of cloudberry (Jorma Kortesharju).
- Wild berry and mushroom yields (Kauko Salo).
- Cultivation research of the seabuckthorn (Kauko Salo).
- Wild berry and mushroom picking and its regional economic importance (Kauko Salo).
- Costs and benefits of the Finnish moose population (Timo Helle).

- Herd productivity in Finnish reindeer management (Timo Helle).
- The effects of modern forestry on grouse populations (Timo Helle).

Special Subjects

- Multiple-use forestry in Scandinavia--Practice and perspectives (Marjatta Hytönen).
- Valuation of nonmarket forest products (Arto Naskali).
- Increasing trampling tolerance of urban forests (Irja Löfström).
- Role of forests and trees in cleaning air of traffic pollution (Irja Löfström).
- City- and commune-owned forests in Finland (Irja Löfström).
- Multiple-use planning of forest resources (Jyrki Kangas).
- The importance and use of wilderness areas (Ville Hallikainen).

Except for the two studies by Hytönen and Kangas, none of the other studies or study areas explicitly focus on MU Management from an "integration of use" perspective. Hytönen's study is an MU literature review and integration, and the one by Kangas is a conceptual, not empirical, one as of the date of this report.

From the above listing, it can be noticed that there are 12 scientists in FFRI doing MU research under the current organizational structure. As we will point out subsequently, there are other FFRI scientists doing MU research, especially those silviculturists concerned with protecting biodiversity, if a different concept of MU--other than "nontimber products" research--is employed. Thus, under the current organization, 12 of the 200 scientists of FFRI work at least part-time on the new program of MU research.

We will now consider some information about each of these 12 MU scientists that is pertinent to this evaluation. Specifically, we will review briefly the graduate-level academic degrees attained, whether the scientist has a permanent or temporary appointment with FFRI, and whether the scientist works full-time or part-time with FFRI. This review is summarized in the following table, but first a word about the academic degrees available in forestry in Finland.

In Finland the graduate-level degree of Master of Sciences in Forestry requires at least 4 years of study at the Faculty of Forestry in Helsinki or Joensuu. Of the two post-graduate degrees, the Licentiate degree requires a thesis but not a dissertation, and the Doctor's degree requires defense of a printed doctoral dissertation but not necessarily additional course work beyond the Licentiate.

<u>Scientist</u>	<u>Degree</u>	<u>Appointment</u>	<u>Part-Time in MU Research</u>
Hallikainen	M.Sc	3-year only	No
Helle	PhD	permanent	No
Hytönen	Student	temporary	No
Kangas	Lic. Sc.	temporary	No
Kortesharju	Lic. Sc.	permanent	Yes
Kubin	PhD	permanent	Yes
Löfström	Lic. Sc.	permanent	No
Naskali	M. Sc.	permanent	No
Reunala	PhD	permanent	Yes
Salo	Lic. Sc.	permanent	No
Sievänen	M. Sc.	permanent	No
Sepponen	PhD	permanent	Yes

There are 12 full-time scientists in FFRI who work totally or part time on MU research. Of these 12, 4 have a doctorate, 4 have the Licentiate ("all but dissertation")

degree, and 4 have the graduate-level degree. Three do not have permanent appointments, and 4 also work part-time on MU research.

3.5 Multiple-Use Forestry Education in Finland

Higher education (i.e., beyond secondary schooling) in forestry began in 1862 in Finland at the Forestry Institute at Evo. The principle task was to educate forest officers in the service of the National Board of Forestry which was created first on a temporary basis in 1851 and permanently in 1859. It was decided to move higher education in forestry from Evo to Helsinki in 1907. Evo now is one of the "technical" schools which serve forestry and forest industries under the National Board of Vocational Education in the Ministry of Education. These schools are roughly equivalent to the two-year technical "ranger schools" in the United States and produce forest engineers and technicians who are not viewed as graduate foresters but have technical skills in forest engineering, forest machinery operation, timber cruising, etc.

The Evo Forestry College did start a program of education in multiple-use forestry in 1981, based on the syllabus for forest technicians. For this purpose, specialized courses, comprising 25 percent of the curriculum, were included in the syllabus. These courses include ecology, nature conservation, recreation use, park management, game management, berry and mushroom production, and guiding and wilderness skills. Evo Forestry College also conducts 3-5 day short courses on multiple-use forestry for workers in forestry. Some of the other technical forestry schools in Finland have similar MU training programs.

Today, higher education in forestry in Finland is offered by the Faculty of Agriculture and Forestry of the University of Helsinki--as it has been since 1907--and by the Faculty of Forestry (established in 1982) of the University of Joensuu. Both of these faculties offer the following degrees: Master of Science, Licentiate, and Doctor of Science--all in Agriculture and/or Forestry. As near as we could tell the Doc (For) degree is equivalent to the PhD offered in other faculties in Finland.

Students at the University of Helsinki can independently build some type of program of MU training within silviculture, but there is no major in MU formally recognized by that faculty. In fact, several people told us that several faculty members there did not think there was anything to teach about MU management beyond the content of a good silviculture course. The professor of silviculture we interviewed at the University of Helsinki did not share that sentiment.

In 1988, a field of study called MU forestry and environmental management was created within silviculture at the University of Joensuu as a specialized major. A position of senior lecturer was established for that major in 1989, but the position was vacant during our visit. In the autumn of 1991, a program was started at Joensuu for MU specialization within forest management planning. It places more emphasis on planning and managerial issues than does the major within silviculture. In 1991-1992, a series of courses will be available at Joensuu for students wanting a major in MU forestry. These courses include: basics of regional planning; management of special-purpose forests; fish breeding and fishery management; use of natural plants and mushrooms; land, water, and environmental rights; landscape management; forest

recreation; environmental conservation and management; planning and economics of MU management; wildlife biology and game management; environmental analysis, environmental economics, and environmental legislation.

4.0 GENERAL EVALUATION OF THE MU RESEARCH STUDIES

We were asked by the Institute to evaluate the scientific quality of FFRI's research projects. While we will evaluate the MU research, we will not evaluate individual scientists for the following reasons:

1. Unlike the other two recent outside evaluations of research programs of the FFRI, which were requested and sponsored by the Academy of Finland¹ and by the Ministry of Agriculture and Forestry², this evaluation was requested by the Institute. As such, it is written for the administrators of the FFRI and not for an outside or higher level agency. Based on our collective experiences gained from appointments in four research institutes (including the University of Michigan's Survey Research Institute) and our having served on the faculties of five universities (The University of Michigan, Northwestern University, and Yale University, University of California at Los Angeles, and Colorado State University), we believe that research administrators know fairly well the quality of research being done by the scientists they supervise.

1 Evaluation of Research in Forest Regeneration in Finland. 1988. Publication of the Academy of Finland. Helsinki, Finland.

2 Evaluation of Research in Business Economics of Forestry in Finland. 1991. Ministry of Agriculture and Forestry. Helsinki.

2. Time constraints did not permit an in-depth evaluation of the research publications and technology transfer efforts of individual scientists.
3. Because we do not have technical expertise in many of the specialty areas being researched in the MU Program, we did not feel competent to critique some of the methods being used.

We did, however, make a detailed analysis of FFRI's MU program of research. That evaluation follows, and it provides the basis for our summary recommendations given in the Executive Summary at the beginning of this report. We wish to emphasize that many of the problems we identified can be attributed to the fact that this program of research was just started formally in 1990 and currently operates with limited funding. Many of the issues we raise can be attributed to this newness, the need to take an opportunistic stance, and the need to adapt to an experimental organizational structure until a better structure could be determined.

4.1 Organizational Structure

While the current organization of the MU Research Program is probably as good as any other to get the program started, we see several problems that should be addressed.

- FFRI's use of the words "MU research" is confusing, because the areas of research addressed have less to do with MU forestry management than they do with achieving an organizational grouping of the research of FFRI on nontimber products. Timber products comprise the most

important category of use for most forest land in Finland. It is illogical to exclude these many timber products from MU research. More directly, why call research on some forest products MU and not call research on the timber products MU research?

If research within the FFRI that focuses on the production of particular types of forest products could be called MU research (using our Descriptive concept of MU)--as is now the case-- that concept of MU is too broad for research planning and administrative purposes, simply because it must cover research on all forest products--as argued above. Then, MU research should adopt the MU Management concept we described, meaning that FFRI's MU research should be about management, not about products. The important question is how to achieve functionally integrated management of particular areas to optimize net value to the Finnish people over time while sustaining the resource base.

Research on the use, value, and production functions of all forest products would be necessary, but that information would be used in the MU Management research to develop models and techniques to guide integrated forest planning and management. The basic question here is: Does the Finnish taxpayer want Descriptive MU research or MU Management research at FFRI? The current MU research orientation and organization might serve useful

purposes now, but will it defer the real objective of achieving on-the-ground MU management? It could.

There are 8 experiment stations in the USDA Forest Service's research organization. Each has a large number of research projects that focus on several research problems (areas of inquiry). To our knowledge, none of these hundreds of research projects focus, by formal title, on MU research. Instead, there are recreation projects, timber management projects, economic projects, tree genetics projects, one cultural resource management project, one land management planning project, wildlife projects, watershed projects, and so on. Yet, all of the 156 national forests practice MU management, using valuation and optimization techniques and decision models developed by research and through practice over time. While "timber has been king" in the USFS too, these nontimber research projects have long been viewed as vitally important for approaching or achieving truly functionally integrated (i.e., MU) management. Timber was made "king" for economic and political reasons and because of forestry training in the German tradition. But that is rapidly breaking down in the management of public forest lands because of social pressures and better professional understanding of the variety of values produced from forest lands. Despite Finland's uniquely strong economic dependency on wood products, our judgment is that the same forces

are at work there that caused the U.S. Forest Service to change its philosophy of management. In particular, the U.S. Forest Service has recently gone through several years of introspection concerning its style of management as reflected by its "New Perspectives" program (see Appendix 2). Those evaluations led to the U.S. Forest Service adapting a new management philosophy, in June of 1992, called "ecosystems management" (see Appendix 3). Appendices 2 and 3 include considerable detail about these changing orientations toward management of public forest lands in the United States.

If our judgement is correct about trends in public attitudes toward forestry in Finland, it might be advisable for FFRI to consider using the words MU differently and organize its current MU research differently. In this way FFRI would be perceived as more responsive to emerging environmental concerns in Finland. We have no clear idea of how that research should be organized, but the following categories of research might be appropriate: MU Management Planning; Recreation, Cultural Resources and Urban Forestry; Wildlife, Range for Domestic Stock, and Fisheries; Wilderness and Other Protected Areas; and Other Nontimber Products. The best name we can think of for such a department is Research on Nontimber Uses.

- The use of the concepts of "by-products" and of "major" and "minor" products to designate particular types of forest products is misleading. What are wild berries a by-product of? They are produced with and

without the production of other products. The designations of major and minor products can only refer to the relative amount and/or to the economic or other value of particular products. What is minor in one locality can be major in another. Aggregations of the volumes or values of all forest products from a national (State-wide) perspective could lead to such a taxonomy, but that causes problems regionally. We see no need for any of these labels. The topic of real concern is forest products, and some previously minor products are becoming major. The public groups interested in particular products do not see them as having minor value to them.

4.2 Research Planning

Several observations were made regarding the planning of FFRI's MU research.

- While the organizational structure for the program of MU research was clear, we saw no overall statement of the objectives of the research, how it relates to other programs of research in FFRI, and how it contributed to on-the-ground realization of MU management. Such a mission statement is needed if it doesn't exist.
- The planning of particular areas of inquiry varied considerably along several dimensions.

Some areas (e.g., research on forest berries and mushrooms and on reindeer husbandry to mention only two of several) reflect systematic planning of a total program of research that was proceeding logically from individual study to

individual study, with an apparent prioritization of what should be done first. While other areas (e.g., recreation, wilderness, and urban forestry) do have some type of problem statement, we find these statements to be somewhat wanting. Sufficient detail was lacking about the nature and scope of particular studies, why each study was needed, what the priority of particular studies was, and the resources and time needed to complete each study proposed. The research in these areas seems to be done opportunistically--probably because of funding constraints. For example, the Program for Outdoor Recreation Research developed in 1985 by the Ministry of the Environment, to which FFRI scientists contributed, listed as a main priority "The compilation and monitoring of statistics of the trends in outdoor recreation participation." Except for several studies of recreational use at local areas, we found no evidence of the serious pursuit of this research objective within FFRI. One would think that obtaining base-line recreational use statistics from a nationwide household study would be a fundamental need if the FFRI is serious about MU Management. While such a study could not have been completed since the MU research program was formally established in 1990, it could have been planned and scheduled by now. While this program of research was developed by the Ministry of the Environment, the question remains: What is FFRI's program for outdoor recreation research?

- As another example, the program of studies for wilderness research, while well conceived and wide in scope, shows no prioritization or rationale for which

studies should be done first and why. We recommend that such a program of study be developed for all on-going areas of inquiry. It should include rationale for each individual study, cost estimates, and time schedules for completion including technology transfer efforts. We recommend that the procedures for making and reviewing such "problem analyses" be standardized and that a formal approval process be implemented.

- We saw no study plans for individual studies and failed to inquire if they are required and if a standard process exists for study plan development and review. If not, there should be, and all study plans should include sections that address the nature of the problem, background information/relevant past research, the hypotheses, study methods and data analysis to be used, and intended publication outlets for study results. These study plans should be prepared by the scientist(s) who will conduct the study, and they should be reviewed by that scientist's immediate supervisor--not so much for quality control as for purposes of coordination.
- A few of the MU scientists who were actively involved in planning MU research studies had no MU studies underway at the time of our visit.
- We found little to criticize about the strong majority of the studies made or underway. All the MU scientists seemed highly motivated, conscientious, and able. We would, however, urge use of more experimental designs with control groups and more timely closure--and getting the results submitted for publication--by some scientists. We

also saw much creativity and good awareness of the states of knowledge about theory and methods pertinent to particular areas of inquiry. With a few exceptions, we would rate the quality of the research as good to excellent.

4.3 Consolidation of Scientists and Creation of Centers of Excellence

Many of the people we interviewed, both affiliated with the FFRI and with other institutions, expressed the opinion that the MU scientists were too scattered throughout the FFRI, with many of them being "a one-person show" and frequently isolated from readily available face-to-face contact with peers of the same discipline. We believe that consideration should be given to integrating and concentrating physically the MU scientists into teams of like-minded individuals, defined either by similarity of disciplinary skills needed for the research or by similarity of research interests in a particular area of inquiry (which would comprise a multi-disciplinary team).

For areas of high priority (e.g., outdoor recreation research) Centers of Excellence, with adequate critical masses of scientists, should be created as funding permits. We realize that movement of some scientists will be necessary to implement this recommendation. Inconveniences and hardships caused by that action can be reduced by making the concentrations over time and centering the team building in locations having the most scientists on permanent appointments. However, consideration must be given to supplemental expertise of particular types in nearby universities.

4.4 Funding and Other Resources

All MU scientists we interviewed expressed the opinion that FFRI was a good place to work. None complained of inadequate facilities. A few expressed desires to have more options to travel. While all of the scientists holding permanent appointments would like more funding, none of them expressed the opinion that they were totally inoperative for lack of funds. Those working on outdoor recreation seemed to be the most severely affected in terms of financial constraints on what they thought they should be doing but could not.

Several of the MU scientists felt rather severe budget constraints, and a few of them were highly dependent on funding from outside the FFRI. Such an arrangement may be acceptable during the start-up period of a program of studies, such as on urban forestry, but we recommend that if adequate in-house funding by FFRI is not available within a reasonable period of time or unless predictable funding over time from outside sources can be found, serious consideration should be given to terminating that line of research.

If funding for the overall program of MU research cannot be increased in future years, serious consideration should be given to reducing the scope of that program to avoid spreading existing resources too thinly. Optimally, funding should be increased.

4.5 Recognition

Several suggestions pertaining to the general topic of recognition emerged from our interviews.

- All the MU scientists we presented this idea to agreed that they would like to see a pool of money established each year that they could compete for to help fund their research.
- Consideration should be given to making an "Outstanding MU Research Publication" award periodically.
- Productive scientists should be encouraged to travel to foreign countries, as funds permit.
- The MU scientists should be encouraged to publish more and also to publish in different outlets, particularly international journals, other than ones they commonly use.

4.6 Education

- Several of the MU scientists are using research projects in FFRI to complete advanced degrees but are lagging quite severely in getting that job done. The FFRI needs to strengthen incentives for timely completion of these academic programs.
- While many of the MU scientists already do so, some should establish closer working relations with scientists in other institutions, especially nearby colleges and universities.
- FFRI administrators need to remain ever mindful that there is a strong physical/natural/biological science "bias" on the part of most of the FFRI scientists. These administrators should continue to offer moral support to the MU scientists, especially the social scientists, in all ways

possible. One way would be to hold periodic seminars at which the MU scientist can describe what they are doing to the other scientists.

- To the extent possible, FFRI should encourage the forestry faculties at the University of Helsinki and the University of Joensuu to continue to develop instruction in MU forestry. MU scientists at those locations should continue to help by giving guest lectures and cooperating in other ways.

4.7 Technology Transfer

Several of the MU scientists are doing an excellent job of transferring the results of their research into practice (e.g., the research on reindeer husbandry and on seabuckthorn cultivation). Since other MU scientists did not have this orientation, consideration should be given to ways to promote technology transfer. These could include a FFRI newsletter addressed to the various nonscientist users, including people who work for the National Board of Forestry, the Ministry of the Environment, conservation groups, the mass media, and the public.

4.8 Responsiveness of FFRI to Social Pressures

Quite a few of the people we interviewed expressed the opinion, sometimes rather adamantly, that the program of MU research was created formally within FFRI not as the result of sensitive-to-society and pro-active research planning by FFRI but because of social pressures. The implicit inferences and explicit statements were that FFRI was

not really serious about MU research. With the following exception, we found no evidence of this within FFRI.

Of the 200 scientists with FFRI, 12 are doing MU research as that program is currently organized. Of those 12, 6 are on part-time and/or temporary appointments. Although the MU research program is new, this could be interpreted as lack of commitment to MU research, and in fact was so interpreted by several of the people we interviewed. Our purpose here is not so much to make a specific recommendation as it is to point out this "perception" problem. It might be desirable for FFRI to appoint a review panel to look into this issue.

4.9 Research Areas not now Covered or Needing Expansion

Many of the people we interviewed recommended that research be started or expanded at FFRI in the following areas:

1. Resource-based international tourism.
2. Environmental education related to MU forestry.
3. The attitudes, values and behaviors of private forest landowners regarding the practice of MU forestry.
4. Expand the research on the values of nontimber products.
5. Hunting and fishing.

5.0 A CLOSING COMMENT

The Executive Summary summarizes our evaluation of the MU research program of the FFRI, so there is no need to provide a summary here. Instead, we close by saying we appreciate the opportunity to have made this evaluation. We were treated quite kindly by everyone we met in Finland, we enjoyed our visit, and we learned a lot. We hope this report will be useful to those who read it.

5.1 REFERENCES

- Academy of Finland. 1988. Evaluation of Research in Forest Regeneration in Finland. Helsinki.
- Central Association of Finnish Forest Industries. 1991. Forest Industry Environment Nature: Trends. Helsinki.
- Central Forestry Board Tapio. 1989. Private Forestry in Finland. Helsinki.
- Finnish Forestry Association. 1990. Annual Ring, 1990-91: Forests, Forestry and Forest Industries in Finland. FFA. Helsinki.
- Finnish Forestry Association. (Undated). Finland - A Country of Forests. FFA. Helsinki.
- Finnish National Board of Forestry. 1988. Finnish National Board of Forestry. Helsinki.
- Gregory, G.R. 1955. An economic approach to multiple use. Forest Science. 1(1): 6-13.
- Löfström, I. 1987. Summary: Urban forestry. Folia Forestalia. 693.
- Ministry of Agriculture and Forestry. 1985. Finland and Forests. Helsinki.
- Ministry of Agriculture and Forestry. 1991. Evaluation of Research in Business Economics of Forestry in Finland. Helsinki.
- Ministry of the Environment. 1985. Program of Outdoor Recreation Research. Helsinki.

Organization for Economic Co-operation and Development. 1988. Environmental Policies in Finland. OECD. Paris, France.

Reunala, Aarne. 1989. The forest and the Finns. P. 38. In: Max Wngman and David Kirby (eds.). Finland: People, Nation, State. Hurst and Company. London (and Indiana University Press. Bloomington, Indiana, USA).

Saastamoinen, Olli. 1982. Economics of multiple-use forestry in the Saariselkä forest and fell area. Finnish Forest Research Institute. Communicationes Instituti Forestalis Fenniae. No. 104. Helsinki.

APPENDIX 1

THE EVALUATORS

Both evaluators are scientists on the Resource Valuation Research Project of the USDA Forest Service's Rocky Mountain Forest and Range Experiment Station in Fort Collins, Colorado, USA. Driver is a research social scientist and Peterson is the Project Leader and a resource economist.

B.L. Driver

Academic degrees are BS (forestry), Virginia Polytechnic Institute; and MS (environmental health sciences), MS (natural resources administration) and PhD (public policy analysis and economics) all from The University of Michigan. Current research focuses on identifying and quantifying the magnitudes of the beneficial consequences of leisure activities (including outdoor recreation) to individuals and groups of individuals (e.g., families, communities, regions, and society at large). Prior research was on the types of experiences desired and expected by outdoor recreationists, user fees for public recreation, and the benefits gained by enrollees in youth conservation programs. He held faculty positions at The University of Michigan (with tenure), Yale University, and Colorado State University (teaching courses in forest policy, outdoor recreation management, environmental planning, and resource valuation) and has held appointments in The University of Michigan's Institute for Social Research and Mental Health Research Institute. Prior to graduate study, Driver held management positions (timber

inventory, timber sale appraisal and administration, and timber stand improvement) with the USDA Forest Service for four years. He is the recipient of several significant national (and other) awards for his scientific contributions. Driver is the 1992 President of the North American Academy of Leisure Sciences, and since 1980 has been chairman of the International Union of Forestry Research Organizations S6.01's Working Party on Social Science and Policy. He has traveled and consulted professionally in at least 20 foreign countries, and is the author or coauthor of 120 publications (including editor or co-editor of 3 textbooks) and of 40 unpublished technical reports to public natural resource management agencies.

George L. Peterson

Academic degrees are BS (Civil Engineering), University of Utah, MS (Environmental Health Engineering), Northwestern University, and PhD (Urban and Regional Planning), Northwestern University. His present research concerns valuation of wildland resource benefits, including monetary valuation of nonpriced amenity resources and multiple-use forestry. Prior research experience includes environmental psychology, social and environmental impact assessment for transportation systems and new towns, and recreation resource management. Prior appointments include faculty positions at the University of California at Los Angeles, Northwestern University, and Colorado State University. At Northwestern, Peterson held the rank of Full Professor and served as Master of the College of Community Studies and Chairman of the Urban and Regional Planning

Council. His teaching experience includes engineering economics, urban and regional planning, multivariate statistical analysis, engineering law, and recreation resource management. He is an elected Fellow of the Academy of Leisure Science and received the 1985 Rocky Mountain Station Outstanding Publication Award and the 1989 U. S. Forest Service Superior Science Award. He is Chairman of Economic Evaluation of Multifunctional Forestry (S6.02-04) for the International Union of Forestry Research Organization. Peterson is the author of 131 scientific papers, 26 major technical reports, and editor or coeditor of 4 books.

APPENDIX 2

THE "NEW PERSPECTIVES" PROGRAM OF
THE USDA FOREST SERVICE

Recent social pressures in the United States have caused the USDA Forest Service to alter its policies and practices and have resulted in that agency adopting what is called "New Perspectives." Since similar social pressures have emerged, and are emerging in Finland, the charter of the USDA Forest Service's "New Perspectives" program is presented in this appendix. This perspective led to the "ecosystems management" philosophy that was adopted by the U.S. Forest Service in June 1992. See Appendix 3 for a description of that philosophy.

NEW PERSPECTIVES

New Perspectives is a different way of thinking about managing the national forests and national grasslands, emphasizing ecological principles, to sustain their many values and uses.

New Perspectives means:

- (1) Good stewardship of the land to sustain its productivity for all values and uses;
- (2) Close partnerships with the people so that their needs, values, and aspirations become integral parts of the resource manager's thinking and actions;
- (3) Strong partnerships between managers, researchers, and educators in learning how to better care for the land and serve the people;
- (4) More flexibility for resource managers and scientists to use their creativity, experience, and knowledge of local conditions to explore and demonstrate good land stewardship and service to people; and
- (5) A pathway for dealing with natural resource issues such as:
 - biological diversity,
 - threatened, endangered, and sensitive species,
 - riparian management,
 - old-growth forests,
 - range condition,
 - hardwood management, and
 - clearcutting.

NEW PERSPECTIVES ON LAND STEWARDSHIP

The 1990 RPA Program, the Forest Service Research Strategy for the 90s, and Forest Plans identify the Forest Service's new direction on natural resource

management. This direction reaffirms sustainable, multiple-use management. But it is multiple use with a difference. It is strongly based on ecological concepts to assure that resource management sustains the health and productivity of the land. And it emphasizes a better balance among the many values and uses of land.

The Forest Service's new direction draws together the philosophical legacy of Gifford Pinchot, Aldo Leopold, and Bob Marshall. It blends Pinchot's principles of responsive public service and wise use of resources for the greatest good of the greatest number over the long run with Leopold's concept of conservation as a state of harmony between people and the land and Marshall's view that wilderness is the "perfect aesthetic experience." Sustaining the greatest good requires healthy, diverse, and productive land and the beauty and spiritual values of wilderness and natural areas.

This stewardship ethic--a blend of responsive public service, wise use of resources, harmony between people and land, and sustaining beauty in wild areas--must guide natural resource management so that it meets the needs and aspirations of current generations without impairing options for future generations.

THE OBJECTIVES OF NEW PERSPECTIVES

The specific objectives of New Perspectives are to:

- **Strengthen the ecological basis of land management** through practices that (1) protect soils, air, water quality, and the biological integrity of the land; (2) produce needed resources while sustaining desired aesthetic and ecological conditions, including long-term health, productivity, and resilience under

environmental stresses; and (3) reflect people's values and attitudes. This may include refinements in ecological classifications and inventories, silvicultural systems, mineral and energy developments, grazing systems, fish and wildlife habitat improvements, ecological restoration, recreation developments, monitoring and evaluation, processes for public participation, and conservation education and interpretation.

- **Sustain the diversity and productivity of the land for multiple-resource values and uses through ecosystem management.** This includes the diversity of native plant and animal species and communities needed to sustain land health and the diversity of human lifestyles and communities that depend on sustainable uses of natural resources. Special emphasis will be on (1) conserving endangered, threatened, and sensitive species of plants and animals; (2) protecting cultural resources and rare or unique biological communities; (3) maintaining ecological processes that keep land healthy and productive; and (4) providing for sustainable and sustained yields of multiple-resource uses. Management for these multiple goals should be integrated across the landscape to meet people's needs, support human communities, and provide the nation with natural resource products consistent with long-term stewardship of the land.
- **Improve the public responsiveness of land management** by (1) strengthening conservation partnerships for sustainable resource management, (2) assuring

that people have full and open access to information and the process of making resource management decisions, and (3) providing for timely responses to changes in public needs and values.

APPLYING NEW PERSPECTIVES

New Perspectives will evolve in four complementary ways:

Best Practices

- Routine use of the best ecological knowledge and environmentally sensitive management practices in implementing Forest Plans.

Demonstration Projects

- Special field projects by teams of managers, scientists, educators, and citizens to demonstrate and refine new approaches for land management that sustain land health and meets people's needs and values.

Learning Centers

- Integrated research and resource management projects to advance the knowledge and tools needed for sustainable ecosystem management.

Conservation Strategies

- Strategic management of controversial or uncertain resource issues through coalitions of individuals and groups interested in finding equitable solutions.

Forest Service people throughout the agency should take the initiative in their own areas to implement the principles and aims of New Perspectives.

EXPECTED RESULTS

As a result of New Perspectives we expect to see the following accomplishments by late 1992:

National Forest System [The National Forests and Grasslands]

- Increased environmental sensitivity in producing natural resources and sustaining their uses.
- Improvements in blending compatible resource uses and values at stand, landscape, and regional levels.
- Better use of scientific knowledge and management experience in implementing and refining forest plans.
- Growing public acceptance for balanced management that sustains the multiple values and uses of national forests and national grasslands.

Research and Development

- Better teamwork between research and management to facilitate the use of new scientific knowledge on the ground and assure that management needs are reflected in research priorities.
- Stronger partnerships among managers, educators, and scientists for developing new approaches to sustainable resource management, educating future land managers, and building the scientific foundation for adaptive ecosystem management.
- Better integration of ecological, physical, and social sciences to accelerate the development of knowledge needed for ecosystem management.

Customer Service

- Open and constructive dialogue with people so that their ideas are used in shaping Forest Service thinking and management of the public's National Forest System.
- Stronger partnerships with people, conservation groups, and resource user groups to assure that their needs and expectations are met.
- A Forest Service culture that better reflects the diversity of values and needs of the American people.

RESPONSIBILITIES, DURATION, AND BUDGET

Responsibilities

A New Perspectives Staff in the Forest Service's Washington Office will coordinate development and implementation of New Perspectives. This will include national aspects of conceptual development, strategic planning, communications, field demonstrations, and evaluation of results.

The Staff will consist of a Director, three Assistant Directors, and a Secretary. The Director provides overall guidance for New Perspectives. One Assistant Director is responsible for coordination, liaison, and guidance on New Perspectives research on development topics and is located with WO Research to facilitate frequent contact. Another Assistant Director is responsible for coordination, liaison, and guidance on New Perspectives conservation and management topics and is located with WO NFS. Another Assistant Director is responsible for external and internal communications on New Perspectives topics and is located with the Director and Secretary.

The Staff Director will be supervised by an Executive Committee composed of the Deputy Chief for the National Forest System and the Deputy Chief for Research. Chief and Staff will provide counsel and advise as appropriate.

A Strategy Group, composed of all Washington Office Staff Directors, will advise the Director of New Perspectives in shaping the approach and major activities of New Perspectives.

A Washington Office Interdisciplinary Team will include representatives of all Washington Office staff. Interdisciplinary Team Leaders will be designated from Washington Office NFS and Research Staffs to guide activities that involve staffs and programs in the Chief's office that affect or are affected by New Perspectives. The goal of these activities is to assure consistent and timely flow of information, and to provide the New Perspectives Staff with ready access to technical expertise when needed.

Joint region/station/area Regional New Perspectives Teams will provide liaison to the Staff and guide all field level activities. Each region and station coordinator will serve on a service-wide directorate for New Perspectives. Regional teams will collaborate with groups and individuals interested in National Forest System management. Responsibilities and activities of regional teams will be established by the regional foresters, station directors, and area director. The New Perspectives Staff and Coordinators will work through existing organizational channels to accomplish its goals, objectives, and actions.

Duration

Future direction on the aims and principles of New Perspectives will be evaluated at the end of fiscal year 1992 [September 30]. Any remaining tasks and responsibilities will be reassigned.

Budget

The annual budget for field work on New Perspectives will be determined by regional foresters and station directors. The annual budget for the New Perspective Staff will be apportioned from the deputy areas for research and National Forest System. The Director of New Perspectives is responsible for administration of the staff budget.

APPENDIX 3

Ecosystem Management of
The National Forest and Grasslands
in the United States

United States Department of Agriculture	Forest Service	Washington Office	14th & Independence SW P.O. Box 96090 Washington, DC 20090
---	-------------------	----------------------	--

Reply to: 1330-1

Date: June 4, 1992

Subject: Ecosystem Management of the National Forests and Grasslands

To: Regional Foresters and Station Directors

We have made good progress over the past 3 years in experimenting with more environmentally sensitive ways to manage the National Forests and Grasslands under our New Perspective program. We learned a lot from our field demonstration projects, research effort, university symposia, and workshops. Mostly what we learned is that ecosystems management works and it is where we need to be headed with our research program and the management of the National Forests and Grasslands.

The Chief and Staff decided last month that it was time to take what we have learned over the past 3 years and implement a new management philosophy for the National Forests and Grasslands. Putting this in simple terms, we have been courting the ecosystem approach for 3 years and we like the relationship and results. Today, I am announcing the marriage and that the Forest Service is committed to using an ecological approach in the future management of the National Forests and Grasslands.

By ecosystem management, we mean that an ecological approach will be used to achieve the multiple-use management of the national Forests and Grasslands. It means that we must blend the needs of people and environmental values in such a way that the National Forests and Grasslands represent diverse, healthy, productive, and sustainable ecosystems. I'm confident that with our knowledge, expertise, and experience along with a stronger public involvement effort, we can bring the American people and their needs together with the land they own in a better way than it has ever been done before by anyone in the world. That's our challenge under this new policy of ecosystems management.

An ecological approach to managing the National Forests and Grasslands is the right way to go because forests are dynamic and complex ecosystems. Forest ecosystems change over time whether managed by people or not. Our management and care is essential to providing diverse and productive habitat for wildlife and fisheries, clean water, clean air, outstanding opportunities for outdoor recreation, natural wood products for American families, and long-term stability to the ecosystem. In a global framework, the forests play a vital role in being the lungs of the earth absorbing carbon dioxide and giving off oxygen. The forests also serve as an important air filter by taking pollutants out of the air and storing them in the forests. These are important reasons why we must put the management of National Forests and Grasslands on an ecological basis. I know this is a tall order, but I believe we are now in good position to do it, and I have confidence in the capability of Forest Service people.

As we learned under New Perspectives, there are three very important points that must be carried forward to make ecosystem management successful:

1. Public involvement - Like never before, the Forest Service must renew its commitment to public involvement and actively seek out and incorporate people's views in our decisions about the management of the National Forests and Grasslands. I envision a new, higher level of dialogue or partnership with the American people to go along with ecosystem management. This is even more important now in view of the proposed changes in the administrative appeal process.

2. Conservation partnerships - Coupled with public involvement, we must expand our partnerships with State and local governments, the private sector, conservation organizations, and anyone else who has shared interest in the National Forests and Grasslands. Let's get them more involved in helping get the conservation job done. The job is simply too big for the Forest Service working alone. Let's challenge people to lend a helping hand by working together in partnership.

3. Land manager/scientist partnership - We have made great progress under New Perspectives to get land managers and scientists working together as a team in doing the best job possible. Let's keep it up and make sure our decisions reflect the best science and close the gap between the level of scientific knowledge and its application in our day-to-day management.

To further round out the new policy on ecosystem management as defined above, the following basic principles will apply to the future management of the National Forests and Grasslands.

1. "Take Care of the Land" by protecting or restoring the integrity of its soils, air, waters, biological diversity, and ecological processes.

2. "Take Care of the People and their Cultural Diversity" by meeting the basic needs of people and communities who depend on the land for food, fuel, shelter, livelihood, recreation, and spiritual renewal.

3. "Use Resources Wisely and Efficiently to Improve Economic Prosperity" of communities, regions, and nations by cost-effective production of natural resources such as wood fiber, water, minerals, energy, forage for domestic animals, and recreation opportunities.

4. "Strive for Balance, Equity, and Harmony Between People and Land" across interests, across regions, and across generations by sustaining what Aldo Leopold (1949) called the land community, meeting this generation's resource needs, and maintaining options for future generations to also meet their needs.

To further add meaning to the policy and principles, I am attaching a set of working guidelines for ecosystem management (attachment 1).

A special issue that we must deal with under ecosystem management is clearcutting. We must accelerate the reduction in clearcutting as a standard commercial timber harvest practice on the National Forests. In making future forest management decisions, clearcutting is to be used only where it is essential to meet specific forest plan objectives and within the circumstances outlined in the attached policy paper (attachment 2).

In summary, the above policy, principles, and guidelines provide firm direction to manage the National Forests and Grasslands on an ecological basis in the future. Yet, there is much room and flexibility for the professional on the ground in working with the public to work out the many details to practice ecosystem management on each National Forest.

I am asking each Regional Forester and Station Director to work together in evaluating their regional situation and within 90 days develop a strategy for implementing the above policy, principles, and guidelines. We need to make good progress at a reasonably rapid pace without disrupting programs, recycling project decision, or redoing project field work. Also, you will need to take advantage of the flexibility within existing forest plans to practice ecosystem management. As forest plans need to be amended or revised they should reflect the above policy on ecosystem management.

We have just celebrated the 100th Anniversary of the National Forest System. In our history, we have

built upon Gifford Pinchot's 1905 philosophy of "conservation and wise use" and "the greatest good for the greatest number in the long run" with the 1960 multiple-use philosophy for sustained yield of natural resources.

We begin our next century with an additional perspective. Ecological management with a higher sensitivity to all of the environmental values of the National Forests is the next logical step in our mission of caring for the land and serving people. Each of you can feel that you truly have been a part of history, and I hope you share my excitement and enthusiasm for the future as we head down the road toward ecosystem management as the best way to meet our multiple-use mandate.

F. DALE ROBERTSON
Chief

Enclosures

cc:
NA
WO Staff

Working Guidelines for Ecosystem Management

1. Focus on desired present and future conditions of the land and its human communities. Focus management action to achieve desired current and future conditions of the land at multiple scales (Caplan 1992), always seeking to balance goals for the land:

- the beauty of the land,
- the stability and fertility of its soils,
- the quality and flows of its waters,
- the clarity of the air,
- the diversity of plants, animals, and biological communities, and
- the interconnectedness and character of habitats and landscapes that provide for the health and resilience of ecological systems and processes;

with goals for the people:

- the prosperity,
- the diversity, and
- the health and vitality of the people who depend on the land for their livelihoods, outdoor recreation opportunities, and inspirational experiences.

Desired conditions must take into consideration economic feasibility and the health, productivity, and resilience of the land over time in the face of unplanned and uncertain future events such as fires, storms, and insect epidemics (Warning and Schlesinger 1985, Botkin 1990). They must also consider continental and global economic and environmental effects of choices made at local and regional scales, e.g., the energy costs of alternative materials.

2. Integrate thinking and actions at multiple spatial and temporal scales. Think about the effect of proposed actions at several geographic scales and through time (Forman and Godron 1986); at least one scale larger and one scale smaller than the scale you are working at and at least for several decades in the future; more and longer if possible.

3. Be especially careful in sensitive areas. Protect special places such as wetlands, endangered species, rare plant populations, and cultural resources.

4. Employ the ecological capabilities and processes of the land. Work within the ecological potential of sites and landscapes, maintain native diversity, and employ nature's processes to the greatest degree possible.

5. Get people involved in planning and carrying out project work. Involve interested and affected people in the full process of making decisions about common resources; plan as if you are in a fishbowl to make sure everyone who wants to has access and knows what is going on; make conservation partnerships the rule rather than the exception.

6. Involve scientists through adaptive management. Monitor research, interpret, and adapt--integrate research with operational management and set resource management up as the continual experiment and learning opportunity that it always has been and always will be.

Attachment 1-2

7. Integrate resource management for operational efficiency. Integrate resources, integrate actions across geographic scales, and build a community of interests—integrate everything and all the time but not necessarily everything on every acre at all times-- this is biologically impossible and, therefore, technically infeasible. Use good judgment!

Reduce Clearcutting on the National Forests

The objective of this new provision is to reduce clearcutting on National Forest System lands and make greater use of individual tree selection, group selection, green tree retention, shelterwood, seed tree, and other regeneration cutting methods which collectively provide for a more visually pleasing and diverse vegetative appearance on a forest-wide basis.

This policy would reduce clearcutting where it has been used as a standard timber harvest practice on the National Forests. Clearcutting would be limited to areas where it is essential to meet forest plan objectives and involve one or more of the following circumstances:

1. To establish, enhance, or maintain habitat for threatened, endangered, or sensitive species.
2. To enhance wildlife habitat or water yield values, or to provide for recreation, scenic vistas, utility lines, road corridors, facility sites, reservoirs, or similar development.
3. To rehabilitate lands adversely impacted by events such as fires, windstorms, or insect or disease infestations.
4. To preclude or minimize the occurrence of potentially adverse impacts or insect or disease infestations, windthrow, logging damage, or other factors affecting forest health.
5. To provide for the establishment and growth of desired trees or other vegetative species that are shade intolerant.
6. To rehabilitate poorly stocked stands due to past management practices or natural events.
7. To meet research needs.

This clearcutting policy combined with the new USDA Forest Service ecosystem management can reduce clearcutting by as much as 70 percent from FY 1988 levels. The reduction on timber volume over the short-run is likely to be about 10 percent. There would be little reduction in timber volume over the long-term. There will be increases in timber sale costs and some areas will not be harvested because local timber industries do not have appropriate logging equipment to use other methods on steep slopes. However, judicious use of alternative harvest methods can be substituted for clearcutting on most areas of the National Forests.

NEW RELEASE

NR-1

USDA TO ELIMINATE CLEARCUTTING AS STANDARD PRACTICE ON NATIONAL FORESTS

Washington, June 4--Clearcutting will no longer be a standard way of harvesting national forest timber under a proposal announced today by the U.S. Department of Agriculture.

"The new policy will limit clearcutting to areas where it is essential to meet forest plan objectives, such as establishing habitat for endangered species of wildlife." said USDA's Forest Service Chief F. Dale Robertson.

Robertson said the proposed clearcutting policy is part of a more ecological approach to management of the Forest Service's 191-million-acre national forest system.

Clearcutting is a harvest method in which all trees are removed at the same time from a site. It is used primarily to reforest tree species which require full sunlight to grow and to create habitat for certain kinds of wildlife, such as deer and elk.

"Although it is a proven forest management tool, clearcutting has become increasingly controversial on national forests because of its appearance and impacts on other resources," Robertson said. "The new policy addresses public concerns and expands current efforts to decrease the use of this harvesting method on national forest lands."

Current regulations, established under the National Forest Management Act of 1976, limit national forest clearcuts to 40 acres or less except for Douglas-fir, southern yellow pine, and Alaskan hemlock-sitka spruce forests where they may be larger. In the past few years, the Forest Service has decreased the number of clearcuts and substituted more visually acceptable harvest methods, Robertson said.

In 1988, clearcutting was used on 310,000 of the 728,424 acres of national forest that was harvested.

"The new policy, in conjunction with the Forest Service's new ecological approach to land management, can reduce clearcutting by as much as 70 percent from 1988 levels," Robertson said.

In 1990, the Forest Service initiated a program, called New Perspectives, to practice more

environmentally sensitive forestry. This approach calls for greater use of harvesting methods that leave green trees and downed woody material on site.

The proposed reduction in clearcutting may reduce timber yields on national forests by about 10 percent in the short run, Robertson said, and there will be some increases in timber sale costs.

"However," he said, "we believe the long term environmental and aesthetic benefits of reduced clearcutting and its accompanying controversy will outweigh any possible short term losses. Judicious use of alternative harvest methods such as selective cutting can be substituted for clearcutting on most national forest areas. And, in the long run, timber yields will be about the same."

Under the proposed policy, clearcutting would no longer be allowed as a standard commercial harvesting practice. Instead it would be allowed only under one or more of the following circumstances:

1. To establish, enhance, or maintain habitat for threatened, endangered, or sensitive species.
2. To enhance wildlife habitat or water yield values, or to provide for recreation, scenic vistas, utility lines, road corridors, facility sites, reservoirs, or similar developments.
3. To rehabilitate lands adversely impacted by events such as fires, windstorms, or insect or disease infestations.
4. To preclude or minimize the occurrence of potentially adverse impacts of insects or disease infestations, windthrow, logging damage or other factors affecting forest health.
5. To provide for the establishment and growth of desired trees or other vegetative species that are shade intolerant.
6. To rehabilitate poorly stocked stands due to past management practices or natural events.
7. To meet research needs.

ECOSYSTEM MANAGEMENT

United States Department of Agriculture

Forest Service

Aug 1992

An "ecosystem" is "the complex community of organisms and its environment functioning as an ecological unit in nature." Ecosystem management uses an ecological approach to achieve the multiple-use management of the national forests and grasslands by blending the needs of people and environmental values to represent diverse, healthy, productive, and sustainable ecosystems.

Just as a house is made up of four walls and a roof, our "natural house" is comprised of many elements: climate, land, water, plants, animals, and changes by people over many years. And, just as relationships with people, pets, and shared habits or values make our regular house a "home," relationships with natural elements define our "natural home." The relationships of our natural home are with diverse plant and animal "communities" and people of all cultures. Ecosystem management requires that we understand how our natural house is built and how our natural home is formed and sustained.

Our goal is to sustain systems that are diverse, productive, resilient to short-term stress and able to respond to long-term change. Our challenge is to use the best scientific knowledge to maintain healthy ecosystems while meeting human needs and values.

We manage ecosystems for specific purposes such as producing, restoring, or sustaining certain ecological conditions; desired resource uses and products; vital environmental services; and aesthetic, cultural or spiritual values. These needs and desires of people are communicated through social, economic and political systems. We achieve these conditions through the land and resource management planning process and the implementation of forest plans.

Ecological management for the national forests and grasslands has both old and new aspects. The Multiple-Use Sustained Yield Act of 1960 remains the cornerstone of Forest Service management philosophy. The Act calls for the "harmonious and coordinated management of the resources, each with the other, without impairment of the productivity of the land." We have learned of the complexity and dynamics of ecosystems and felt increasing pressure on public lands to provide both more and a wider array of goods and services.

The key differences between ecosystem management today and good resource management of the past lie in the integration of the data we collect and use, and the breadth of elements considered in our decisions. Through increased scientific knowledge, we now realize that we cannot examine each resource separately or by relatively small blocks of land, the "building blocks" of our "natural house."

Ecosystem management itself is an evolutionary process. The Forest Service is following these principles as we implement ecosystem management:

- * the need to sustain ecosystems;
- * respect for ecosystem dynamics, complexity, and options;
- * development of desired future ecological conditions in plans and management;
- * coordination of management across administrative, ownership, and jurisdictional boundaries;
- * use of integrated data and tools; and,
- * an emphasis on integrated management and research.

ISBN 951-40-1259-3
ISSN 0358-4283
PunaMusta Joensuu 1992