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and 2400-M

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National Summary

Reforestation and Timber Stand Improvement Report

Fiscal Year 2002

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Message from the Acting Director of Forests and Rangelands

Here is the Reforestation and Timber Stand Improvement Report for fiscal year (FY) 2002. The contents of this report also appear on the Forest Service home page on the Internet at http://fsweb.wo.fs.fed.us/frs/fm/silviculture/index.shtml. The report provides the following types of information:

- First, it summarizes production levels at each Forest Service nursery and seed extractory and displays service-wide production trends at these facilities. This same section also provides information on genetic resource improvement programs.

- Second, it displays reforestation program accomplishment in each region and examines reforestation program trends nationally. This same section also summarizes reforestation success in terms of plantation establishment

- Third, it shows timber stand improvement (TSI) program accomplishment in each region and displays TSI trends nationally.

I hope that you find this report both informative and useful in examining the trends, achievements, and challenges for forest vegetation management on National Forest System lands.

JANETTE KAISER
Director, Forests and Rangelands

Preface

This report is produced each year to provide a summary of the Forest Service's nursery, genetic resource improvement, reforestation, and timber stand improvement programs. This report responds to the reporting requirements outlined in FSM 2470, 2490, and FSH 2409.14. Resource data summarized in this report was derived from automated reports extracted from the TRACS-SILVA data base, as well as non-automated information compiled by Forest Service nursery managers, reforestation/TSI specialists, geneticists, and silviculturists.

Following the Executive Summary, this report is organized in three major sections:

- **SUMMARY OF THE FY 2002 FOREST SERVICE NURSERY AND GENETIC RESOURCE PROGRAMS**

  This section of the report summarizes FY 2002 production data at FS nurseries and seed extractories and assesses the production trends and future outlook for these facilities. This section also contains a summary of Forest Service genetic resource improvement programs.

- **SUMMARY OF THE FY 2002 REFORESTATION PROGRAM**

  This section of the report displays FY 2002 reforestation accomplishments and program trends. This section also contains information on plantation survival.

- **SUMMARY OF THE FY 2002 TIMBER STAND IMPROVEMENT (TSI) PROGRAM**

  This section of the report displays FY 2002 TSI accomplishments and program trends.

Included in the appendices at the end of the report are numerous tables providing more detailed information pertaining to Forest Service nurseries and seed extractories, regional reforestation and TSI programs, and reforestation success**.** The common names for tree species identified by code on selected tables in this report are shown in Appendix C.

Executive Summary

Some of the highlights for FY 2002 include:

- Forest Service nurseries produced about 31 million seedlings in FY 2002, an increase of about 7% from FY 2001 production levels (29 million seedlings).

- Forest Service seed extractories produced roughly 7 thousand pounds of seed representing over 120 species of grasses, forbs, shrubs, and trees.

- Silvicultural examinations were done on about 562 thousand acres and silvicultural prescriptions were developed on about 689 thousand acres to achieve a diverse array of management objectives on National Forest System lands.

- Reforestation treatments occurred on more than 160 thousand acres. About one-half of this work was K-V financed, approximately 41% was financed using appropriated funds, and the remainder (9%) was accomplished using contributed funding sources.

- Timber stand improvement (TSI) treatments occurred on about 170 thousand acres. About 60% of the treated acres were precommercially thinned, about 32% were treated to eliminate competing weed species and release trees to maintain or improve stand growth. Pruning and fertilization treatments were done on the balance of these acres.

- Reforestation needs increased by about 52 thousand acres while TSI needs increased by about 17 thousand acres nationally over the corresponding values reported last year.

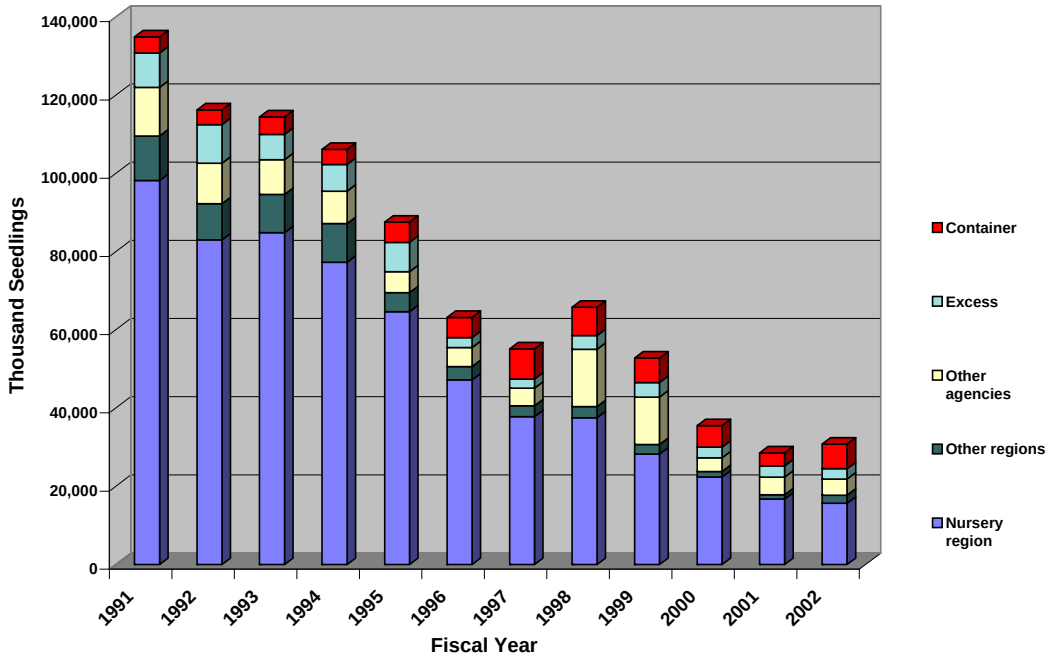
- First-year survival averaged about 68% nationally and third-year survival averaged 60%.

SUMMARY OF THE FY 2002 FOREST SERVICE NURSERY AND GENETIC RESOURCE PROGRAMS

Seedling Production at Forest Service Nurseries

Forest Service (FS) nursery production, including both bare-root and container stock, was up by about 7% from the previous year at about 31 million seedlings (Tables 1 & 2 in Appendix A). This increase reverses a trend of marked declines experienced in prior years resulting from reduced timber harvest, shifting emphasis toward intermediate treatments (commercial thinnings and salvage removals), and increasing reliance on natural regeneration to achieve reforestation objectives. The increase in FY 2002 production levels is attributable to increase demand for tree seedlings to reforest areas following wildfire. Production trends from FY 1991 through FY 2002 are shown in Figure 1.

Figure 1 -- FS Nursery Seedling Production



Seedling Production Trends, Sowing Requests, and Acquisition from Other Sources

Seedling production levels have generally been declining at FS nurseries since FY 1991. As of the end of FY 2002, production levels at these facilities had declined by -77% from the levels reported for FY 1991 (134.9 million seedlings). The outlook for future seedling orders and sowing requests are shown in Tables 1A and 1B in Appendix A. The data presented in these tables shows a slight decline in inventory levels at these facilities in the next year, followed by continued declines in anticipated seedling production levels thereafter. Table 4 summarizes seedling acquisition from sources other than FS nurseries.

Seed Production at Forest Service Seed Extractories

Approximately 7 thousand (M) pounds of seed was produced during FY 2002, down sharply from FY 2001 extraction levels (14 M pounds). Seed production levels can be highly variable from year-to-year, reflecting the unique characteristics of individual plant species and the periodicity of good seed crops in each species. These variations can be seen in the trends in seed production at FS facilities for the 12-year period shown in Figure 2.

Figure 2 -- Seed Production at FS Seed Extractories

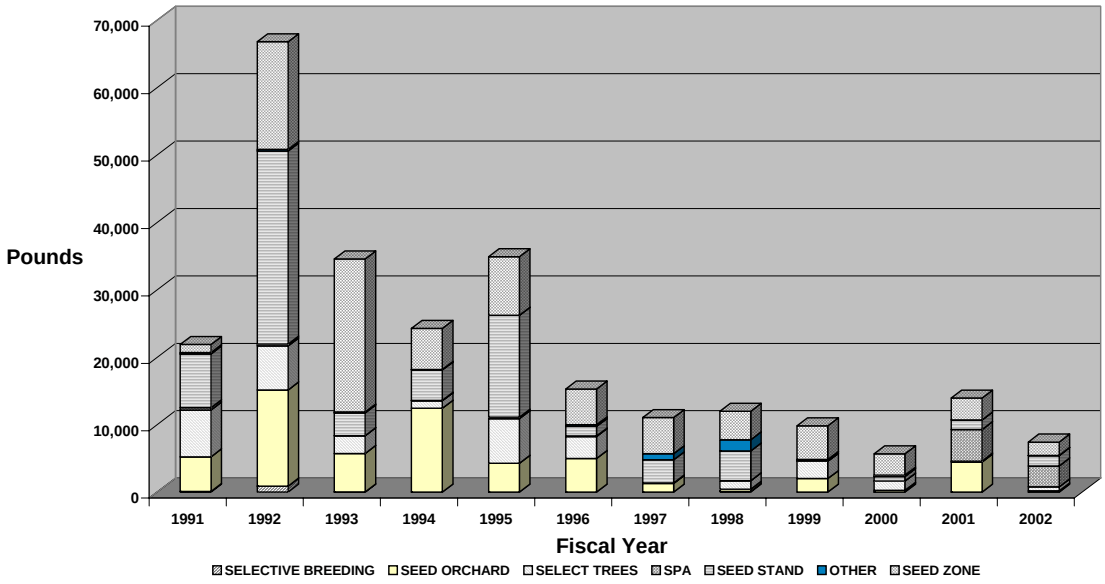


Table 3 in Appendix A summarizes the source of origin for seed processed at FS facilities in FY 2002. About 3% of this seed was collected from seed orchards. The list of plant species being processed at these facilities includes about 125 species of grasses, forbs, shrubs, and woody plants.

Table 5 in Appendix A summarizes seed production area (SPA) status for FY 2002. No seed production areas were established in FY 2002; however, SPA's were eliminated on 183 acres resulting in a total of 3,319 acres in SPA status.

Genetic Resource Programs

Genetic resource improvement work is summarized in Tables 6, 7, 7A, and 7B in Appendix A. These programs make valuable contributions to improved forest health by identifying and conserving important genetic traits that control resistance to major pests, providing baseline genetic information for forest management activities using genetic test plantations and lab studies, producing adequate quantities of improved seed to meet demand, and by incorporating genetic principles into silvicultural treatment prescriptions and planning efforts.

The National Forest Genetic Electrophoresis Laboratory (NFGEL) is a facility dedicated to providing genetic analyses to resource managers throughout the agency. The facility was established in 1988 as part of the National Forest System. The purpose of the Laboratory is to analyze molecular genetic markers (proteins and DNA) in plant material submitted by Forest Service employees and those from other cooperating entities. Early NFGEL projects focused primarily on conifers, exploring genetic variation patterns to refine seed zones and to resolve questions about clones, populations, and genetic sources. More recently, following the development of the FS Genetic Resources Strategic Plan, NFGEL was given the mandate to begin work examining forest vegetation other than trees. NFGEL provides baseline genetic information, determines the effect of management on the genetic resource, supports genetic improvement programs, and contributes information in the support of conservation and restoration programs, especially those involving native and threatened, endangered, and sensitive species.

NFGEL projects were processed to meet a variety of management objectives. Project results were used to guide restoration and conservation projects, and assist in silviculture and tree improvement activities. During FY 2002, NFGEL continued to follow its mission to "provide state-of-the-art molecular genetic information to the National Forests and other cooperating agencies for the evaluation and protection of our nation's genetic resource". Genetic analysis performed during FY 2002 included the following:

- DNA profiling of several plant species including the 13 surviving trees planted under the direction of George Washington growing at Mt Vernon, Virginia.

- Developing a database for ponderosa pine that will be used to identify off-site plantations. Information will be used to improve overall forest health since offsite stands are generally associated with disease and declining performance.

- Determining levels of pollen contamination in Douglas-fir and sugar pine seed orchards. Protects the integrity of reforestation material.

- Determining taxonomy and gene/species conservation strategies for several threatened and endangered species (Collomia, Lupinus, Rorippa, Hackelia, Silene).

- Determining the genetic diversity and evolution of several pine species growing in the southeast US, and the genetic structure and species conservation strategies for quaking aspen growing throughout the Eldorado National Forest, U.S. Forest Service.

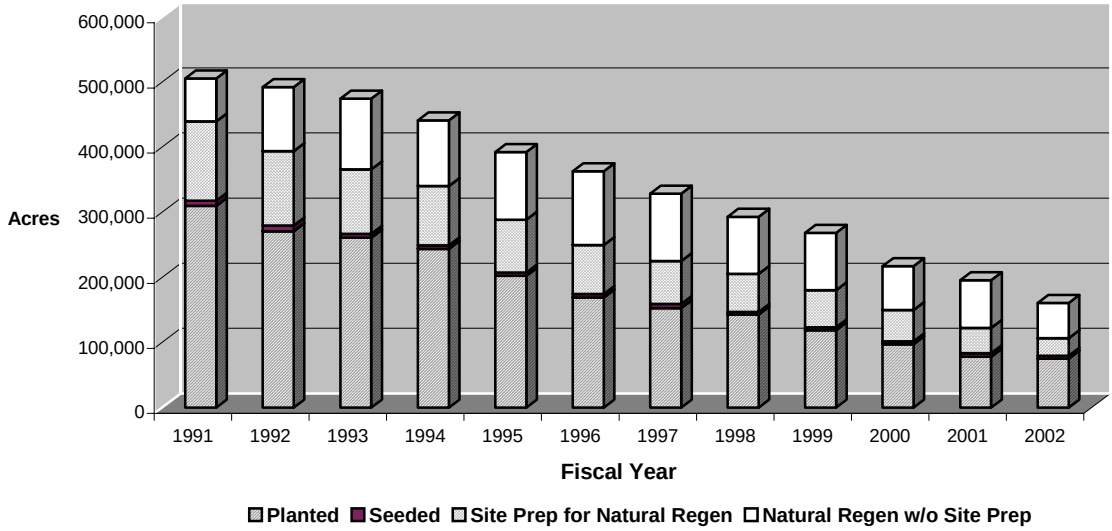
Tours of the facility and operation were provided to Forest Service, state and other federal government employees, members of the public, industry, local colleges, university faculty, graduate students and to foreign scientists from Mexico and Canada. NFGEL formed collaborations with FS Research Stations, Northern Arizona University (Flagstaff), Bureau of Land Management, California Department of Transportation, US Fish and Wildlife Service, University of California at Davis, and private companies. Detailed Fiscal Year accomplishment reports for fiscal years 1998 to 2001 can be found at http://dendrome.ucdavis.edu/NFGEL/.

SUMMARY OF THE FY 2002 REFORESTATION PROGRAM

FY 2002 Reforestation Accomplishment and Program Trends

About 146 thousand acres of National Forest System lands were reforested during FY 2002 using appropriated, reforestation trust (RTF), and Knutson-Vandenberg (K-V) funding sources. Contributed funds provided resources to reforest an additional 14,876 acres, bringing the grand total for FY 2002 to 160,814 acres. This represents a reduction of about –18% from FY 2001 (195,593 acres). The distribution of these acres by the type of reforestation treatment is shown in Tables 9, 10, 11, and 11A in Appendix A. Included in the reforestation accomplishment total for FY 2002 are 54,085 acres of natural regeneration without site preparation. Reforestation accomplishment by K-V funding occurred on a total of 80,609 acres, representing a –27% reduction from FY 2001 (110,604 acres). K-V reforestation acres continue to decline as a result of reduced harvest levels and a reduced amount of regeneration harvesting. National trends in reforestation accomplishment from FY 1991 through FY 2002 are shown in Figure 3, illustrating the steady decline in reforestation accomplishment since FY 1991.

Figure 3 -- National Trends in Reforestation Accomplishment



Additional information concerning reforestation accomplishments in FY 2002 is presented in Table 12 (Site Preparation for Planting or Seeding), Table 18 (Animal Control for Reforestation), and Table 21 (Certification of Reforestation treatments), as well as summary of harvest acres by cutting method in Table 20 in Appendix A.

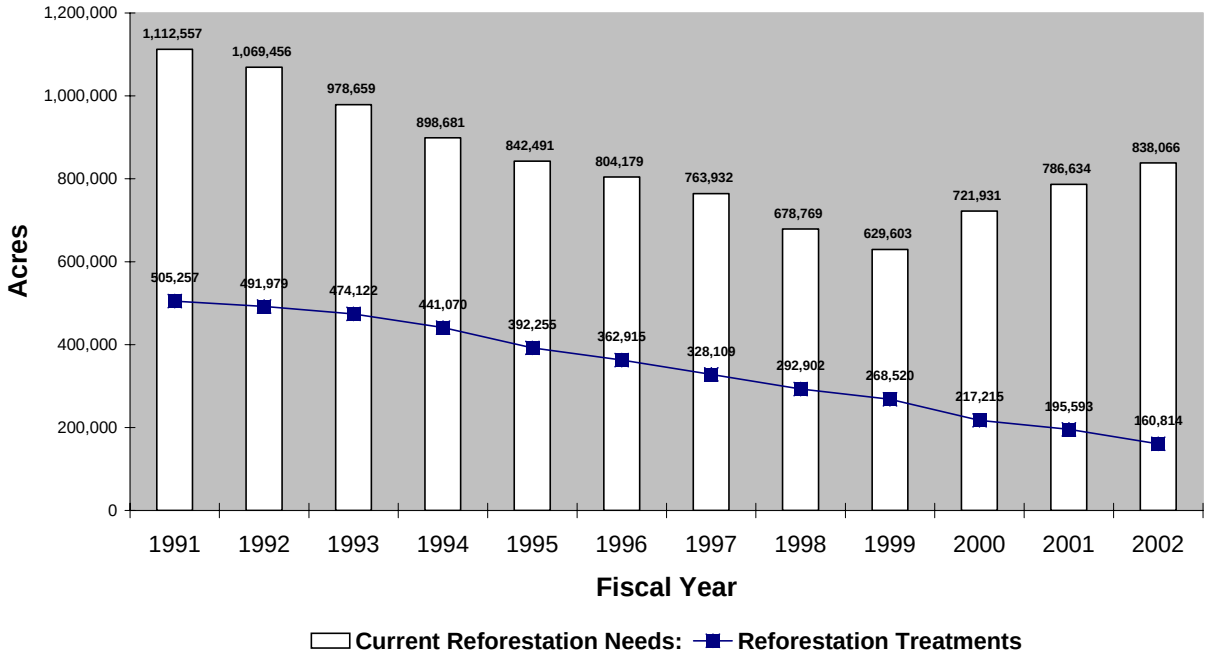
FY 2002 Reforestation Needs and Trends

Current reforestation needs are estimated at 838,066 acres, representing about 5 years of reforestation work at present levels of accomplishment. It generally takes 2-3 years of lead time to prepare the site, grow seedlings adapted to specific sites, and make arrangements for getting the trees planted using either contract or force-account crews. Nationally, the net increase in reforestation needs was about 52 thousand acres in FY 2002.

As was the case with the trends in reforestation needs observed in past few years, the increase in reforestation needs is primarily attributable to the wildfires occurring in the western U.S. during the past three summers. It is notable that the rate of reforestation treatment in FY 2002 was insufficient to keep pace with the increase in added reforestation needs for the third year in a row.

National trends in reforestation needs are depicted in relation to reforestation treatments and reforestation failures in Figure 4. Reforestation failure rates remain low, with failures declared on about 15 thousand acres nationally in FY 2002 representing about 9% of reforestation treatment acres.

Figure 4 -- National Trends in Reforestation Needs



Plantation Survival

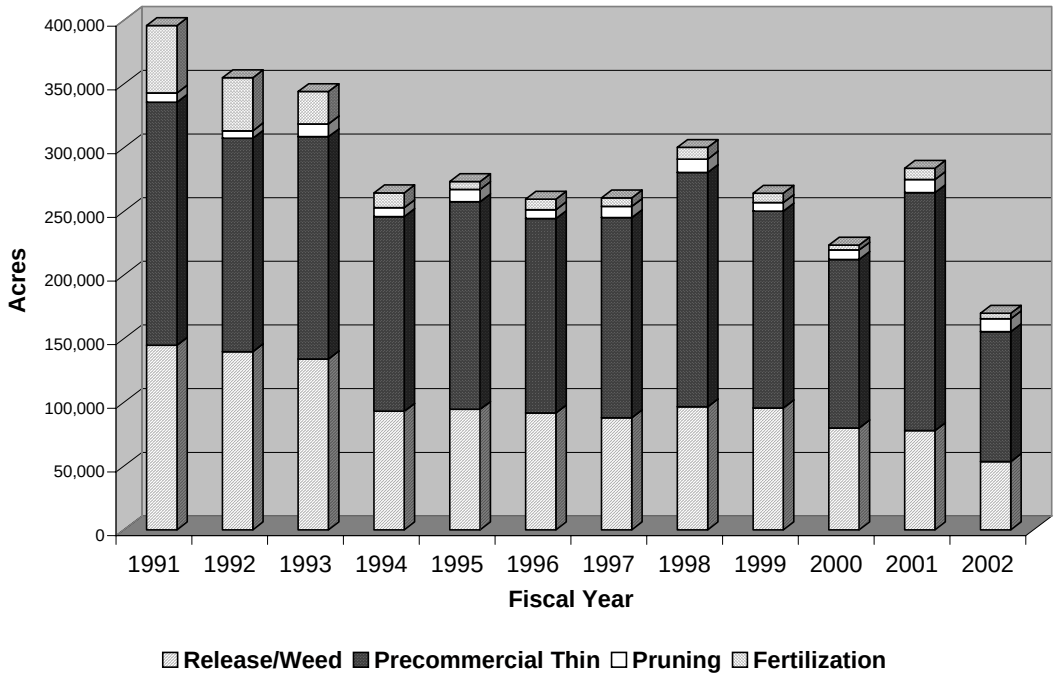
The results of the plantation surveys made following the 2001 growing season are summarized in Table 22 in Appendix B. First-year survival nationally averaged 68%, declining slightly from the average posted in last year's report (70%). The national average for third-year survival was reported at 60%, the same average for third-year survival reported in the FY 2001 report (60%). Despite this sharp decline, reforestation success on most sites is sufficient to satisfy management objectives and to certify these areas as satisfactorily stocked. Where survival levels are not sufficient to meet management objectives, a failure is declared and the area is programmed for re-treatment. The effect of dry conditions prevailing over much of Western U.S. and resultant increases in early seedling mortality is the principal explanation for the sharp decline in third-year survival.

SUMMARY OF THE FY 2002 TIMBER STAND IMPROVEMENT (TSI) PROGRAM

FY 2002 TSI Accomplishment and Program Trends

About 170 thousand acres of National Forest System lands received TSI treatments during FY 2002 from all funding sources. This represents a decrease of about -40% from FY 2001 attainment levels (284,000 acres), due in principal part to contributed work done under the National Fire Plan adding roughly 42 thousand acres of TSI accomplishment to the total for FY 2002. The distribution of these acres by the type of TSI treatment is shown in Tables 13, 14, 15, and 16 in Appendix A. National trends in TSI accomplishment for the past 12 years are shown in Figure 5.

Figure 5 -- National Trends in TSI Accomplishment



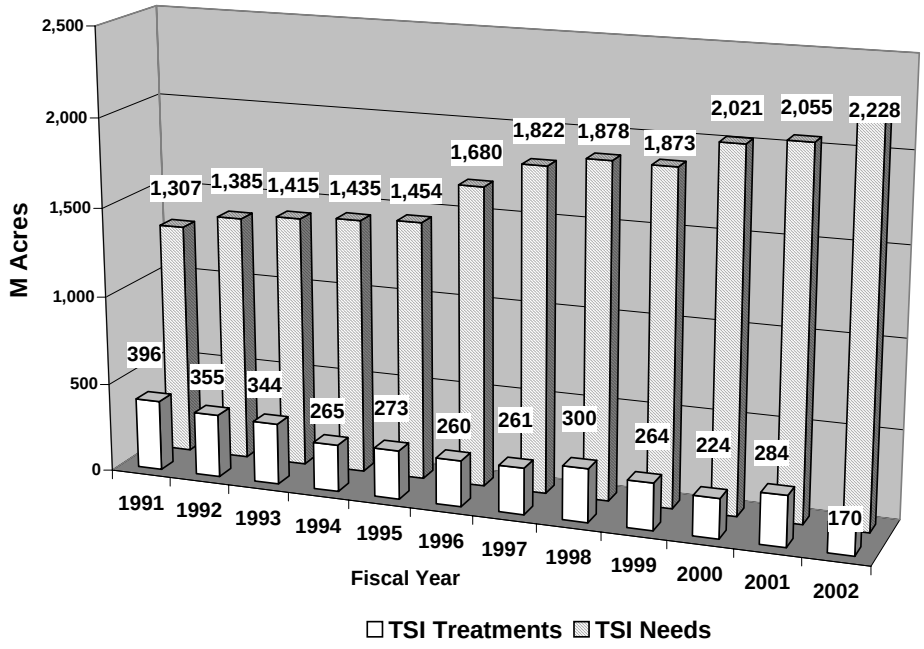
The sharp reduction in attainment in TSI activities reflects the effects of an unusually severe fire season and the need to allocate resources toward fire recovery efforts. This general trend in declining TSI accomplishment is also a reflection of reduced funding for forestland vegetation management work and also results from the need to apply a limited amount of appropriated funding to assure prompt reforestation following wildfire and other disturbance events.

Additional information on TSI accomplishments is provided on Table 17 (Prescribed Burning to Control Understory Species), Table 19 (Animal Control for TSI), and Table 21 (Certification of TSI Treatments) in Appendix A.

FY 2002 TSI Needs and Trends

Current TSI needs are estimated at about 2.23 million acres nationally, an increase of about 17 thousand acres over the TSI needs level reported in FY 2001 (2.06 million acres). FY 2002 TSI needs represent about 13 years of work at FY 2002 levels of accomplishment. The gap between TSI needs and accomplishments widened markedly from FY 2001 to FY 2002, resulting in sharp increases in the amount of TSI work on the national forests. National trends in TSI needs and accomplishments from 1991 through 2002 are shown in Figure 6.

Figure 6 -- National Trends in TSI Needs and Treatments



Appendix A

Tables 1 through 21