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IDAHO'S TIMBER SUPPLY PICTURE

by

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INTRODUCTION

The present and expected future timber supplies on commercial forest land within the state of Idaho must be estimated as accurately as possible if individuals are to effectively evaluate the impact of the timber supply on the state's economy and assess the state's contribution to the nation's timber supply. Estimates of Idaho's present and expected future timber supplies were developed by the University of Idaho's College of Forestry, Wildlife and Range Sciences under a contract issued to the Idaho Department of Lands by the Pacific

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Using the most recent forest inventory data available for the commercial forest land within the state, timber supply in units of net cubic foot volume per acre year was projected from the present to the year 2045. Alternative timber supply estimates were developed and are presented separately for northern and southern Idaho by each of the following ownership groups: National Forest, Other Public[1], Forest Industries, Other Private.[2]

A forest stand table projection model was used to develop the timber supplies presented in this study. This type of model requires that forest stands be described in the form of stand tables which are number of trees in

[1]Other Public includes State Department of Lands, Bureau of Land Management, Bureau of Indian Affairs, county, municipal and miscellaneous federal ownerships.

[2]Other Private includes farmer and miscellaneous private ownerships.

forest stands tabulated by diameter classes. For each diameter class in the stand table, growth rates, mortality rates and removal rates are required.

This paper is designed to give an overview of Idaho's timber supply picture from 1975 to 2045. Timber supply projections are explained and discussed. Individuals interested in a detailed discussion of the methodology, data bases and assumptions used in the Idaho timber supply study are referred to College of Forestry, Wildlife and Range Sciences Experiment Station Bulletin No. 15.

TYPES OF TIMBER SUPPLY PROJECTIONS

Factors strongly influencing the level of timber supply that can be expected from the commercial forest land in the state of Idaho are the number of acres in the commercial forest land base, the intensity with which the timber resource is being utilized, and the growth and mortality rates of the forest stands.

Timber supply projections reported in this paper are developed for a commercial forest land base of 14.7 million acres. It is assumed that the acreage will remain at this level until 2045.

Timber supply projections reflect two timber resource utilization intensities:

1) 100 percent utilization intensity, and
2) 1975 utilization intensity.

Timber supply projections based on 100 percent utilization intensity assume all commercial forest land is managed exclusively for timber production with complete utilization of all trees 4 inches in diameter and larger. Timber supply projections based on 1975 utilization intensity assume commercial forest land management at a 1975 level of emphasis on multiple-use, environmental and economic management objectives.

Timber supply projections reflect four alternative growth and mortality rates. Timber supply, the total volume of annual removals, is equated to:

a) 1975 gross volume growth,[3]
b) 1975 net volume growth,[4]
c) a modified net volume growth computed with a mortality rate twice the 1975 mortality rate, and
d) a modified net volume growth computed with a growth rate 10 percent greater than the 1975 growth rate and a mortality rate 10 percent less than the 1975 mortality rate.

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[3]Gross volume growth is defined as total volume growth before deductions for losses due to mortality.

[4]Net volume growth is defined as total volume growth after deductions for losses due to mortality.

TIMBER SUPPLY PROJECTIONS

Timber supply projections for the state of Idaho are illustrated in Figs. 1 through 10. Interesting and important factors portrayed in these graphs are discussed in the following paragraphs.

Sustaining Current Level of Timber Supplies

The solid dot in Figs. 1 through 8 indicates the 1975 level of timber removals for each ownership group. If the solid dot is at or below timber supply curve 2b, that ownership group should be capable of sustaining its current level of timber removals through 2045. The assumption in obtaining timber supply curve 2b is that commercial forest land acreage, utilization intensity, and net volume growth rates remain at 1975 levels. As indicated by the position of the solid dot with respect to timber supply curve 2b, all ownership groups except for Forest Industries in northern Idaho are capable of sustaining their current level of timber removals. Forest Industries in northern Idaho will have to reduce their current level of timber removals before 2045. It should be noted, however, that by allowing timber removals to exceed net growth during a short-term program, an owner can increase the rate at which mature and overmature stands are converted to younger, more rapid growing stands.

Two factors could cause all ownership groups to reduce their current level of timber removals. These are a reduction in commercial forest land acreage, and less emphasis on timber production and/or more restrictive environmental management conditions.
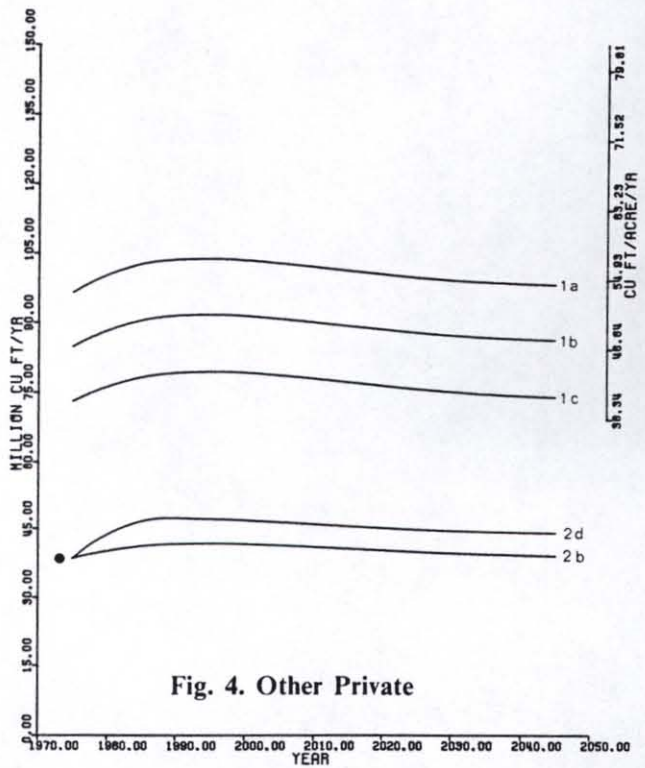
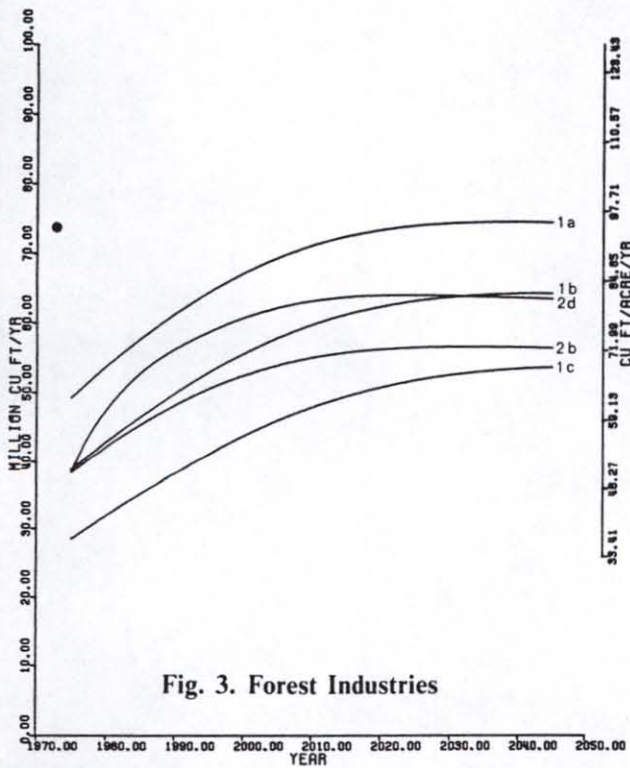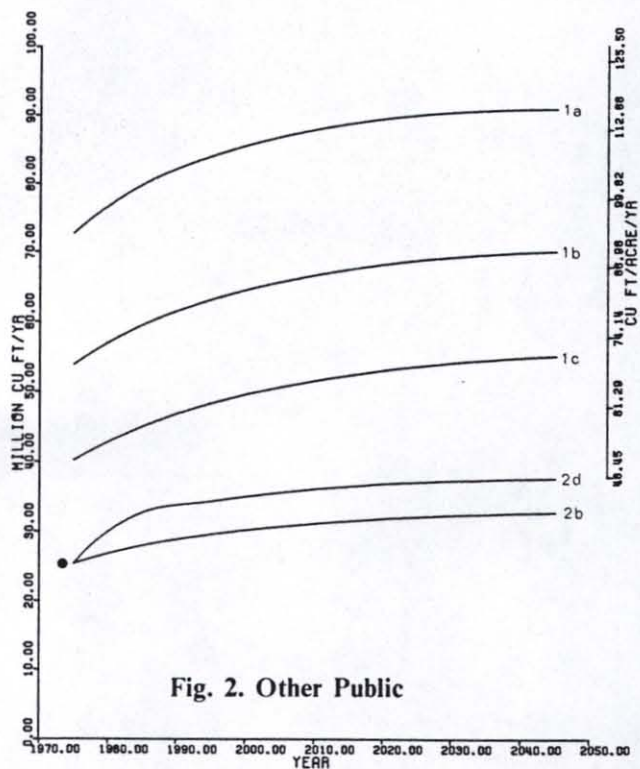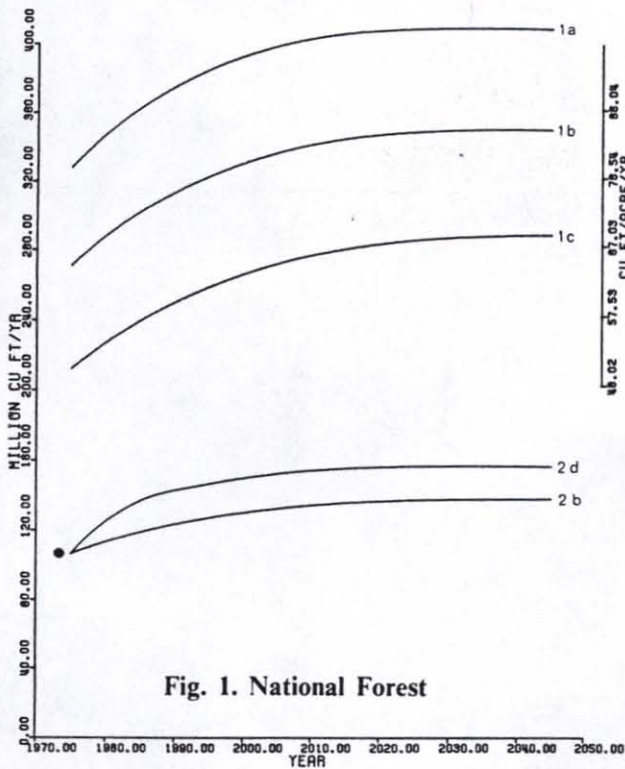### Effect of Utilization Intensity

In Figs. 1 through 8 a comparison of projected timber supply curves 1b (100 percent utilization intensity) and 2b (1975 utilization intensity) indicate the tradeoffs in timber supply associated with esthetic, watershed, other multiple-use, and environmental management objectives. Management of commercial forest land exclusively for timber production is limited by these objectives. Merchantability standards[5] are also reflected in the difference between these two curves, but multiple-use and environmental management objectives are the dominating factors. The assumption in obtaining timber supply curves 1b and 2b is that commercial forest land acreage and net volume growth rates remain at 1975 levels.

Because of multiple-use, environmental and economic management objectives, the timber supply associated with curve 1b is not a realistic goal on publicly owned commercial forest land. It only becomes an attainable goal on commercial forest land where the owner exclusively manages his land for timber production.

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[5]Merchantability standards include factors such as minimum stump and top diameter criteria.

Fig. 1. National Forest

Fig. 2. Other Public

Fig. 3. Forest Industries

Fig. 4. Other Private

NOTE: The solid dot (•) denotes 1975 average annual removals. Detailed definitions of the timber supply projections are described under Types of Timber Supply Projections.

1a Annual removals equaling 1975 annual gross volume growth - 100 percent Utilization Intensity.

1b Annual removals equaling 1975 annual net volume growth - 100 percent Utilization Intensity.

1c Annual removals equaling a modified annual net volume growth - 100 percent Utilization Intensity. Modified annual net volume growth is computed using growth alternative c.

2d Annual removals equaling a modified annual net volume growth - 1975 Utilization Intensity. Modified annual net volume growth is computed using growth alternative d.

2b Annual removals equaling 1975 annual net volume growth - 1975 Utilization Intensity.

Spatial location and accessibility of forest stands should also be considered when evaluating timber supply projections. Timber supply curve 1b assumes each forest stand in the commercial forest land base in Idaho is readily accessible. For numerous acres this is not the case.

Effect of Increased Growth Rates

Increased net volume growth can be obtained through forest management practices which simply control the density of forest stands. The increase in timber supply that could be attained through regulation of stand densities is shown by the differences between timber supply curves 2d and 2b in Figs. 1 through 8. The assumption in obtaining these curves is that commercial forest land acreage and utilization intensity remain at 1975 levels. If increased timber harvest is desired, more intensive forest management practices would need to be employed. Such management practices could take the form of genetically improved growing stock, fertilization and regeneration of current nonstocked acreages. However, it should be recognized that increases in growth rates may often be difficult to obtain when a constant or increasing level of emphasis on multiple-use and environmental management objectives is maintained.

Increases in timber supply through improved management, in most cases, are slight when compared to gains that might be accomplished through the relaxation of multiple-use and environmental management objectives. This is illustrated by the difference between timber supply curves 2d and 2b as compared to the difference between timber supply curves 1b and 2b.

Effect of Mortality

In Figs. 1 through 8, the comparison of timber supply curves 1a, 1b, and 1c indicates the sensitivity of the timber supply projections to different mortality rate estimates. The assumption in obtaining these curves is that commercial forest land acreage remains at 1975 levels and is managed at a 100 percent utilization intensity. Curve 1a reflects timber supplies in the absence of mortality. Slight errors in the estimation of mortality can substantially modify the timber supply projections. For example, if actual mortality rates are in fact twice the mortality rates obtained from current forest inventories, timber supplies would be represented by curve 1c rather than curve 1b. It is important that this factor be recognized since mortality rate estimates are most subject to error in current forest inventory procedures.

It should also be noted that the difference between 1975 utilization intensity and 100 percent utilization intensity would not be as great if current estimates of mortality were half what they should be. This is illustrated by the difference between timber supply curves 1b and 2b as compared to the difference between timber supply curves 1c and 2b.

Comparison of Timber Supplies by Ownership

Figs. 9 and 10 illustrate the domination of timber supplies in the state of Idaho by the National Forest ownership group. Over 50 percent of the projected timber supply in northern Idaho and over 80 percent of the projected timber supply in southern Idaho is produced by the National Forest ownership group. The assumption in obtaining these timber supply curves is that commercial forest land acreage, utilization intensity and net volume growth rates remain at 1975 levels.

This domination is a direct result of the fact that in northern Idaho over 55 percent and in southern Idaho over 85 percent of commercial forest land acreage is in the National Forest ownership group.

CONCLUSIONS

Using present forest management practices, commercial forest land owners should be able to maintain 1975 levels of timber supply through 2045. If forest management practices were implemented which would regulate forest stand densities, projected timber supplies would exceed 1975 levels.

The projected levels of timber supply can only be expected if the commercial forest land base and emphasis on social, economic and environmental management objectives remain at their 1975 levels for the entire projection period. A reduction in the commercial forest land base would reduce projected levels of timber supply. More restrictive timber management practices resulting from changes in the emphasis placed on social, economic and environmental management objectives would also reduce projected levels of timber supply.

Estimates of mortality are the component of growth most subject to error using current forest inventory procedures. Since mortality directly influences projected timber supplies, it is important that forest inventory procedures be implemented which reduce the variability of this estimate.
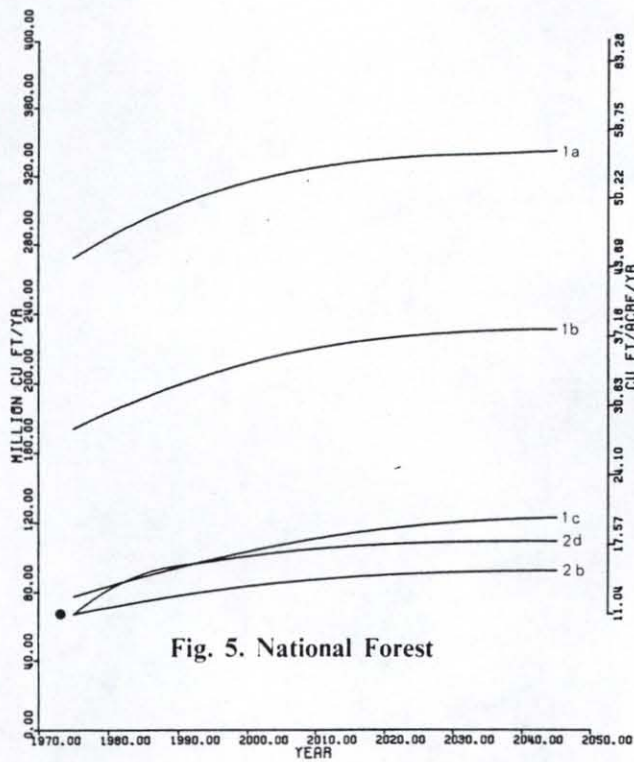
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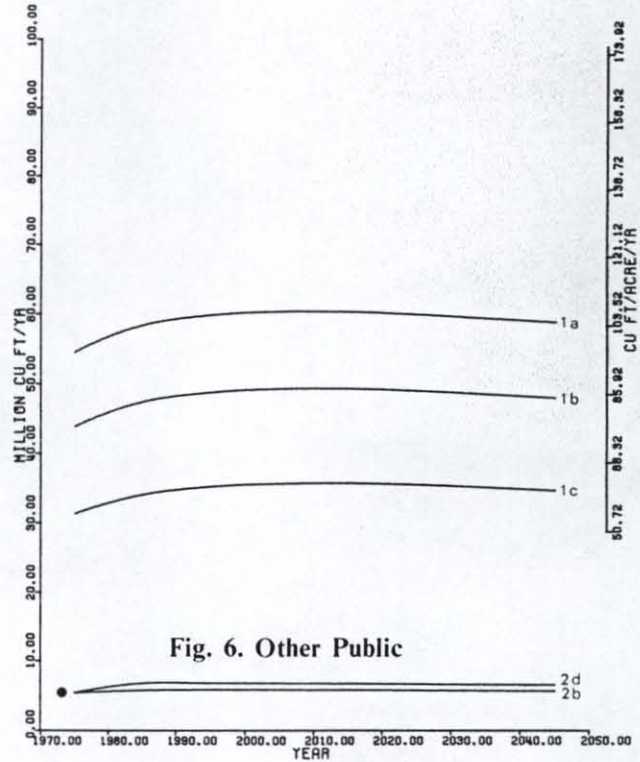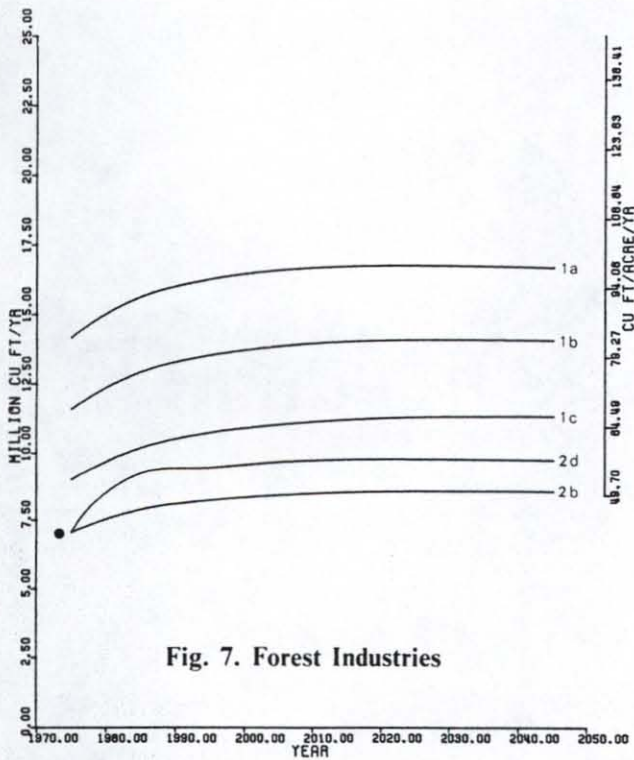Fig. 5. National Forest

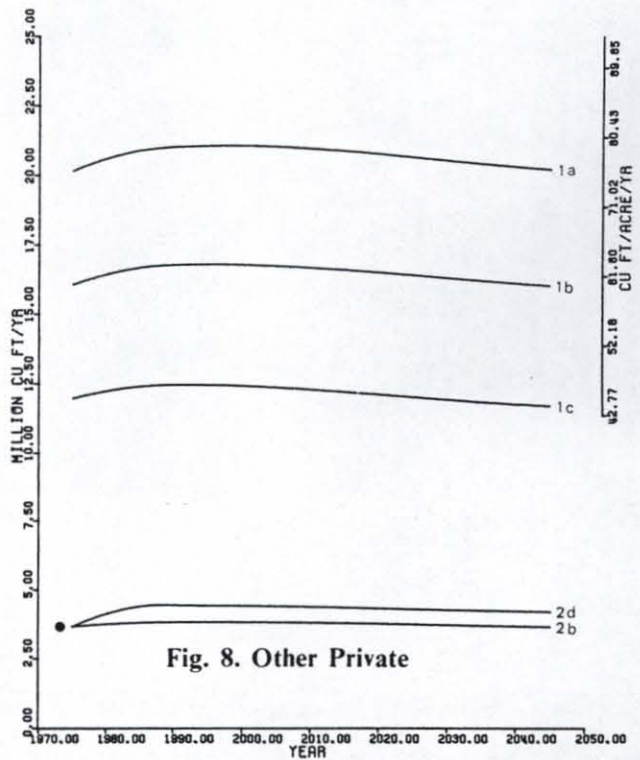Fig. 6. Other Public

Fig. 7. Forest Industries

Fig. 8. Other Private

NOTE: The solid dot (•) denotes 1975 average annual removals. Detailed definitions of the timber supply projections are described under Types of Timber Supply Projections.

1a Annual removals equaling 1975 annual gross volume growth - 100 percent Utilization Intensity.

1b Annual removals equaling 1975 annual net volume growth - 100 percent Utilization Intensity.

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2d Annual removals equaling a modified annual net volume growth - 1975 Utilization Intensity. Modified annual net volume growth is computed using growth alternative d.

2b Annual removals equaling 1975 annual net volume growth - 1975 Utilization Intensity.
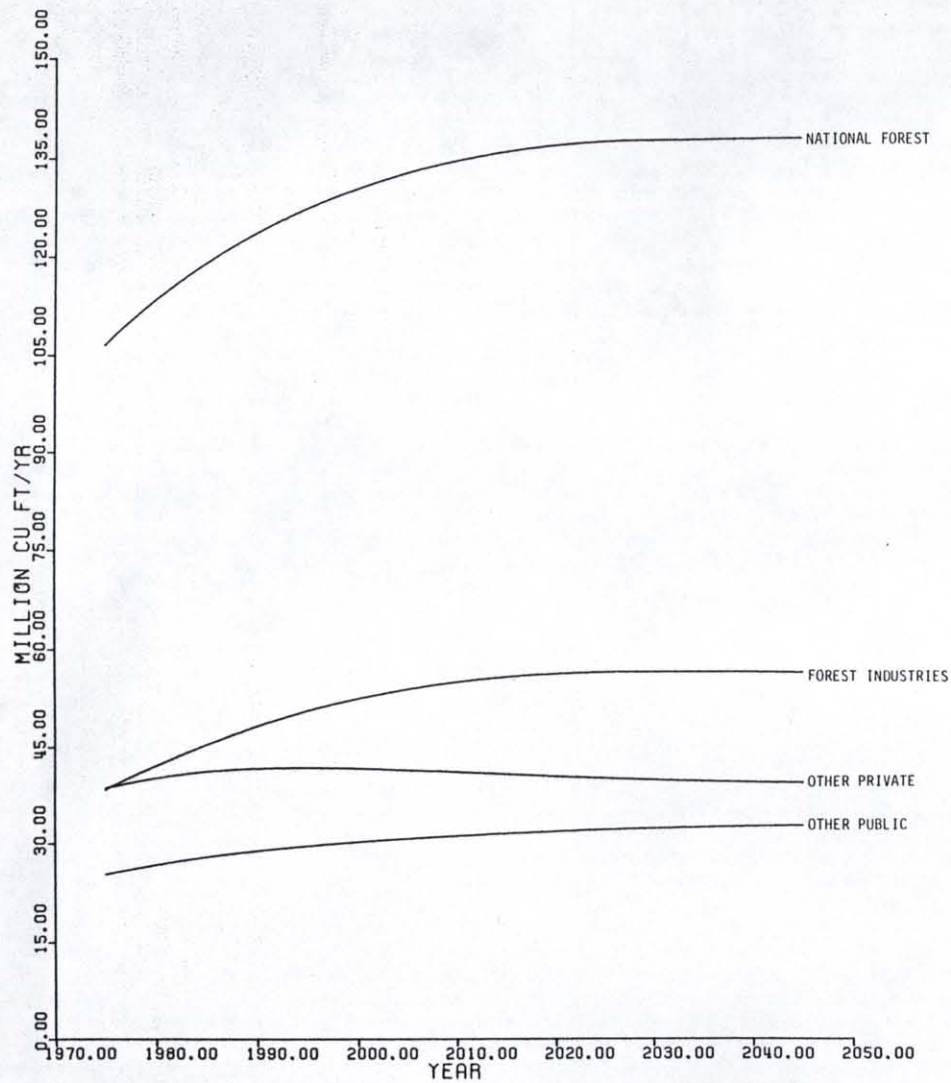
Fig. 9. Projected average annual timber supplies by ownership group based on 1975 annual net volume growth and utilization intensity — Northern Idaho.
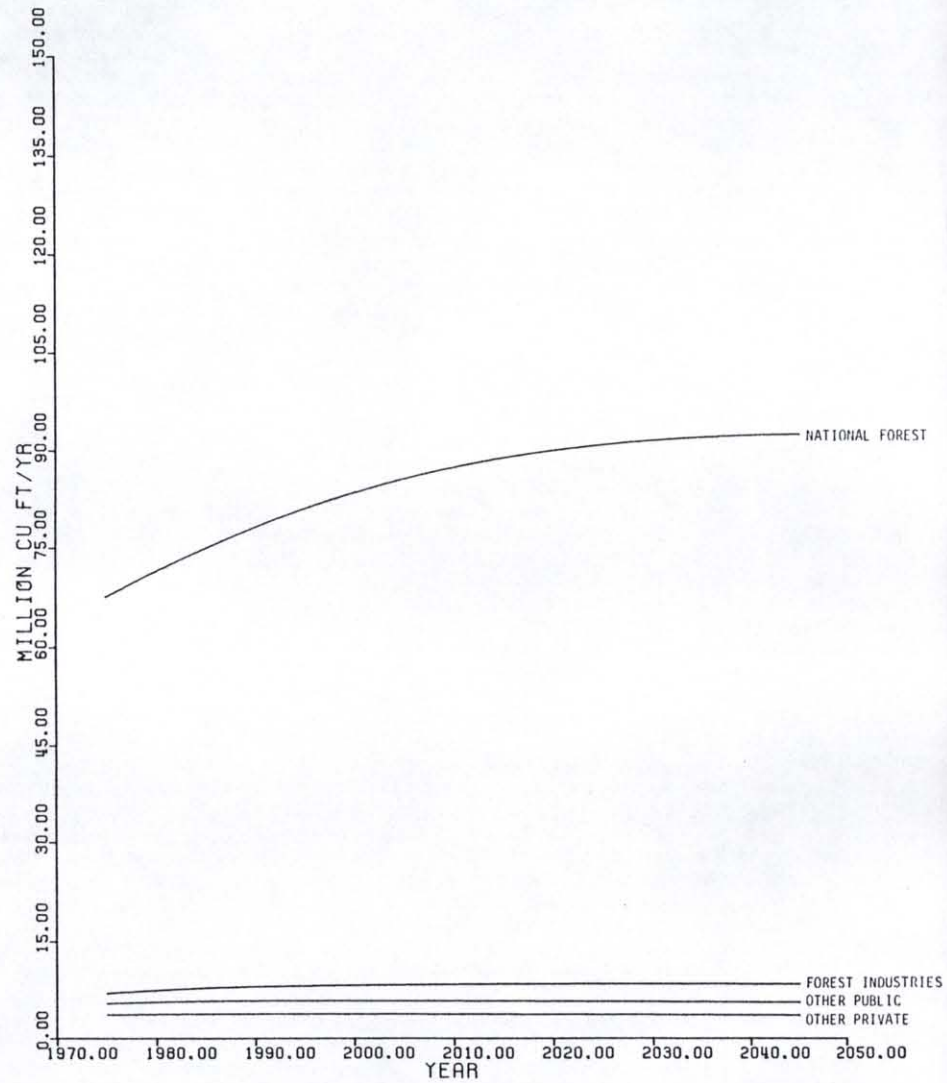

Fig. 10. Projected average annual timber supplies by ownership group based on 1975 annual net volume growth and utilization intensity — Southern Idaho.