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THE BEST USE OF FOREST LANDS

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Forest lands of the United States make up a highly important part of
d resources. The areas involved are large; numerous forest products
vices are produced; and many economic interrelationships with agri-
and industries exist. Forest areas comprise about 630 million
according to reports of the National Resources Board, or nearly one-
the total land area. Lands used for agriculture, by comparison,
to 415 million acres, and range land 550 million acres.

Any general forest area, such as the national forests, includes
pes of "wild land" or vegetation cover, with timber, brush, barren
as types occurring in different patterns. Some of these types are
only for purposes such as watershed protection, grazing, or recre-
Most forest lands however, produce lumber and other wood products,
the same time yield social benefits from these subsidiary uses.

The "best use", or the best combination of uses, on the 630 million
of forest land is a rather broad problem, but will be considered in
aper as that which contributes most to social welfare. Forest lands
be put to their best use when they make the greatest possible addi-
o national income, considering both financial and non-monetary
s, over long periods of time.

Utilization of forest resources is of importance to many social
. Consumers have an interest in low-priced timber products and in
plementary services provided by forests; labor groups and commun-
depend on forest employment, while owners of industries are inter-
in raw material supplies and investment returns. Conflicts between
different interests frequently occur. Certain private incomes are
ed by scarcity of timber and high values, for example, but society
when there is relative poverty of useful resources. Policies for
welfare should consider populations receiving direct returns from
use, others receiving indirect benefits or incurring the social
of scarcity and depletion, and future generations dependent on the
e of resources which they will inherit.

Trends in forest land use have pointed toward more intensive forest
tion and utilization. As timber resources in the East, the Lake
, the South, and more recently the Pacific Northwest have dwindled
a swiftly moving migratory lumber industry, various steps have
aken to prevent further timber depletion. The pioneer attitude of
ing tree cover as an obstacle to agricultural expansion is now found
n limited regions. The forest conservation movement has steadily

et momentum during recent decades and has in addition spread to other
ral resources. Since 1891 the area of national forests has expanded
gh reservation of public lands and acquisition. Fire protection has
extended to most forest lands under the Weeks Law of 1911 and the
o-McNary Act of 1924. Selective logging methods developed in recent
s are leaving forest lands in better condition for producing timber
s. Some beginnings in sustained yield forestry have also been made.

While cutover land is now being left in a more productive condition,
ate forestry is barely launched on a policy of producing continuous
st crops. Most operating lumber companies are still geared to deple-
of their virgin stands because of limited timber supplies in relation
ant capacity or because of the financial advantages of quick liquida-
Nevertheless it is estimated that 20 percent of the private forest
are now being managed under good forestry practices, and over 80 per-
are in good condition for growing timber crops.

The past utilization of our forest resources has created many
mic and social problems. Decadent communities mark the passing of
ring operations and wood-using industries. In regions such as Oregon,
gton and California, local cutting exceeds local growth, indicating
the process of abandoning sawmill towns and shifting populations to
occupations will continue. Remaining timber supplies are located
rom market centers. Large fire losses still occur, with protection
l inadequate on more than 40 percent of the private forest lands.
problems of an overexpanded lumber industry and changing timber
ds also exist.

In addition to timber utilization, supplementary uses yielding non-
ary benefits are of increasing importance. Recreation in timber
has expanded with amazing rapidity as highways have been extended
forested regions. Users of the national forests increased in number
the last few decades from next to nothing to several million
rs annually. Pressure for hunting and fishing in forest areas con-
to increase.

Grazing of livestock on the 334 million acres of forest lands
usable forage is of outstanding importance, particularly to western
tock producers. Summer grazing on forest and mountain ranges supple-
the winter grazing and crop agriculture in valley areas at lower
tions, and thus makes possible the continued existence of much of
stern livestock industry.

Forest cover is also becoming of increasing importance for protect-
tersheds. In areas such as southern California and in many western
the development of agricultural valley lands has intensified the
ity of flood control and the need for stable water supplies for
tion, power, and domestic use. Expenditures for protecting water-
over have become increasingly necessary in many river systems to
t the silting of reservoirs, to insure usable water supplies, and
tect farms, residences, and other investments from flood damage.

h these trends toward more intensive use of forest lands for creation, grazing, and watershed protection in mind, attention ntered on two problems, that of the best alternative use of d, and that of the best intensity of forest management.

Alternative Use of Forest Lands

many regions such as the Pacific Northwest and the Sierra Nevada of California, timber growing, grazing, or crop agriculture are e uses. Historically, lands have usually been left for forest hen deemed too poor for agriculture. Attempts to farm the so-rginal" areas have created such intense social and economic however, that efforts have been made to determine the economi- suitable alternative use.

considerable expansion of crop agriculture into forested areas ther remote, judging from agricultural trends. In many regions, er hand, some crop lands are even reverting to forest. Numerous plain the relaxing of pressure for agricultural expansion, such s of export markets, increased use of machinery, and the reduced opulation increase. An addition to the area of crop land of 30 lion acres may be needed by 1960, according to the National Re- oard, but new crop acreage undoubtedly will be created from till- re and reclamation projects rather than forest lands.

nflicts between grazing and forestry are somewhat more intense st in forest regions of many states where there is pressure for of livestock ranching and subsistence farming. Heated arguments burning" signify the continued importance of this conflict. much forest land has been converted into pasture by fire, indis- burning in regions such as the Sierra Nevada foothills has no-mans land of brush which produces income for neither stockman ter. Intensified fire protection, on the other hand, has re- zing capacities on some forest lands once used for grazing by growth of trees rather than grass or browse.

assifying lands in the marginal grazing-forest zones depends on t opportunities for the population involved, on trends in demand native products, and on the criteria used. In general, the best rginal zones may be determined from the alternative net real ealized by all groups affected by utilization of the area in 1/ The income distribution patterns and the permanence of re also involved in this criterion.

e need of present income for living often forces subsistence to graze livestock on forest lands regardless of timber destruc- ltimate forest incomes. Pressure of population on resources is istic in areas of low productivity, and population pressure

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vid Weeks and H. R. Josephson. "Economic criteria for classi- -urban land according to probable best use." Journal of Farm , May, 1939.

es depletion. To redistribute population, however, involves the task of developing alternative employment.

ssification of land for various uses depends, moreover, on comparing incomes. High rates of discount used in valuing orest incomes result in low values for forest use. On the other low discount rates, possibly justified for long period valua- the standpoint of society, may indicate values for long deferred omes equal to or greater than values for grazing use.

ional policies affect land classifications by influencing agri- nd grazing pressure on the remaining forest lands. Thus if the nt problem gets bad enough to force a partial reversion to nditions, the best use of some land now in forests might be for e farming. With such a movement subsidies would have to be aintain anything but pioneer living standards.

alizing best use of forest lands thus involves a land-use classi- based on general economic trends and on prospective incomes o all social groups. Making classifications effective usually re controls such as zoning or other legislation.

addition to competitive relationships, forestry and agriculture supplementary uses. The system of permanent forestry in Europe o a large extent upon the use of resident labor deriving agri- income from small farms in forest regions. In many parts of the e farm woodlots and well-distributed forests are common, more tilization of agricultural labor can be promoted by appropriate licies. In our western states seasonal labor requirements for e and lumbering coincide to such an extent that a close supple- elationship usually does not exist. Nevertheless, income from r or lumbering constitutes an important element in the support bsistence ranchers located in or near forest areas.

residual forest lands not claimed for crop agriculture or graz- sters have the task of balancing competitive and supplementary es. Many combinations of timber production, recreation, water ion, wild life production, and grazing occur on forested lands. e are "islands" of resources adapted to one specific use, as e of lakes or meadows in timber areas, the problem is primarily inistering the intermingled recreational or grazing uses by a rest management organization. Combining uses on given areas of d is often a difficult economic problem in forest administra- creational activities such as hunting and camping characteristi- found on areas used primarily for timber production. Other ons of subsidiary uses and timber growing frequently occur on a a. One of the main economic objectives in forest planning is to ese various forest uses so as to obtain the optimum output of returns and indirect social benefits. Production of goods and from several forest uses justifies spending funds for protecting oping lands of relatively low values.

Intensity of Forest Land Use

he determination of best alternative land use and the best combina-
forest uses is thus of major importance in forest planning, but a
cation of the residual forest lands for management intensity is
ded. We have approximately 460 million acres of "commercial"
ands with wide variations in stands, growth and accessibility.
g timber on these lands raises questions of the desirable intensity
ement, and the allocation of areas between public and private owner-
xtreme variations in management are possible, varying from limited
tection to an intensive forestry.

or a classification of management intensity accurate forest inven-
f stands, growth, and drain are needed, together with economic
of prospective use and demands. The desirable intensity of man-
depends, like alternative uses, upon a number of economic factors
ds.

he factor of major importance, for example, is the amount and dis-
h of timber supplies in relation to drain. Through the last few
arnings of timber famine have been frequent, some emanating from
tionists and others from industries producing wood substitutes.
the alarm of 30 years ago was justified in view of the long upward
wood consumption, underestimates of timber supplies, and large
ses. Since 1906, however, annual lumber production has fallen
to about 20 billion board feet. Substitute materials have been
reasingly for products such as fuelwood, posts and poles. On the
nd, the use of wood for paper, rayon, plastics, and other cellulose
though relatively small, has shown a strong upward trend.

s a result of reduced wood consumption and regrowth on cutover
mber growth and drain now practically balance for the country as
Wood supplies are sufficiently plentiful that a future shortage
nger probable. In contrast, fears are even expressed that future
ay not absorb prospective timber production.

though timber exhaustion appears remote, many economic problems
bution and local depletion still remain. In eastern regions
on exceeds local supplies, necessitating costly timber imports
r regions such as the South and the Pacific Northwest. It would
be socially economic to spend money for fire protection and
owing in the deficit regions and at least reduce the amount and
imber imports. Total wood utilization is balanced by volume
ut large trees and valuable species are being used, whereas re-
curs on small trees of inferior quality.

mand factors are of particular significance in planning the use
cial forests, since the marketing of products must be recognized
inspring of industrial forestry. What consumers will pay for
n of trees into lumber, paper, and other products will determine
employment and capital returns. Investments in timber growing
governed by prospective demands for timber products, with an

adequate reserve of publicly-owned timber for emergencies or for production in response to new demands. In the light of present trends in wood use and population growth, it is estimated that future wood consumption will vary from recent levels of about 14 billion cubic feet up to 19 billion cubic feet of wood annually. Many national policies affecting population, employment or construction activity, however, will influence actual market demands for timber products.

The intensity of management on forest lands is also influenced by national policies such as those involving tariffs. The tariff increases in 1930 and subsequent foreign retaliation explained in part the loss of foreign markets by domestic producers of Douglas fir, redwood, and other timber species. Proposals for tariffs to enable wood producers in the United States to supply all our pulpwood and paper requirements involve a choice between national welfare and benefits to forest industries. Since more than 50 percent of our pulp and paper consumption is imported, diverting demands to domestic forest industries would increase the intensity and profitability of forestry in this country, but at the same time exports of other products from the United States undoubtedly would be reduced.

The desirable intensity of management for timber-growing lands is also beclouded by a number of other economic factors. Over-optimistic investments have been made in the purchase of many large timber holdings. Subsequent installation of sawmills created capacity almost twice that required to produce even the peak lumber demands of the predepression years. The need for income to meet heavy interest payments on bonded indebtedness, taxes, and protection costs in turn necessitated either rapid timber liquidation or bankruptcy. At the same time declining demands for lumber in both domestic and export markets aided in bringing about lower prices and profits than expected. Low investment returns in an overexpanded lumbering industry have darkened the outlook for sustained yield forestry. The existence of thousands of small timber holdings as well as excess capacity has tended to intensify competitive conditions in the lumber industry.

The deflation of speculative timber values and an apparent need for reduction of plant capacity have many counterparts in agriculture and industry. If economists can find desirable means of curing agricultural "surplus" problems, perhaps foresters can adopt the same methods for solving these problems of timber production.

While short-run influences often make forest investments appear unattractive, economic incentives favor more intensive management and permanent forest industries. Frequent cutting by selective logging methods has been made possible in most timber regions by the development of roads and efficient tractor and truck equipment. Cutting the larger high-value trees usually makes possible the early liquidation of a large part of forest investments, and at the same time converts stands into growing stocks of vigorous trees capable of rapid value increment. Studies in regions such as the pine belt of the Sierra Nevada foothills indicate the feasibility of obtaining high rates of earnings on trees left in selectively cut stands. It is essential that owners initiate selective cutting methods before timber reserves are depleted, however.

Forest management for continuous timber crops is also being influ-
by trends in interest rates. Low earnings in timber industries in
st have resulted in pressure to liquidate investments in order to
st in alternative enterprises promising greater returns. Declining
in interest rates, bringing about levels of 3 to 5 percent and even
or industrial bonds, place even low earnings of forest investments
ore attractive light. These economic trends favoring continuous
ent and incomes over long periods are of considerable importance
forest use on the large areas of private lands will be determined by
tive profit if private initiative is preserved.

In view of trends in timber consumption and prospective timber
s, it appears to be wise policy in the case of the depleted and
t forest lands to provide only protection from fire in order to
e watershed values and adjoining timber. Young stands on acces-
areas, on the other hand, promise returns on investments in protec-
d stand improvement. Remaining virgin forests, in particular, often
managed profitably for sustained yields when of high growth capacity
essible to markets, and when excess plant capacity does not compel
depletion. The better forest areas may be expected to yield a dif-
al rent from the production of timber crops.

Large areas of depleted cutover and poor timber lands offer few
ents to private management, since incomes will be limited and long
ed. With public ownership, there is a question as to how great
e returns on present expenditures must be to become "profitable".
outlays to rehabilitate forest resources often show promise of
net return, yet productive timberlands will benefit future genera-
Many recent expenditures to maintain forest resources, moreover,
en made by public agencies as part of an emergency spending program,
andard cost accounting systems do not indicate the profitability of
investments when unemployment of labor and capital is prevalent.
heless, alternative incomes from investments of relief funds should
raised in a national planning program when expenditures can be made
spitals, housing projects, or production of commodities.

The allocation of public funds for forest protection and management
ious degrees of intensity is important in forest planning. Since
ely owned lands are of greater area and value than publicly owned
forest investments might be made most economically if concentrated
more productive private forests where returns are potentially
st. Spending public funds on private lands is justified by the
benefits from cheaper forest products and from the supplementary
uses which yield non-monetary returns.

Policies to Promote Best Forest Use

Forest policies to make effective the classification of lands for
ations of forest uses and for intensity of timber management may be
ized briefly as (1) provide adequate fire protection on all forest
to insure some kind of vegetation, (2) promote intensive forestry
more productive lands to produce timber for prospective demands,

expend funds for forestry purposes according to timber growing capacity prospective benefits, (4) foster permanent operations to maintain stable munities and industries.

Policies designed to attain the best use of forest lands apply efly to areas in private ownership. Privately owned lands make up ee-fourths of the commercial forest area, and include the most valuable ber and the more productive sites. Farm woodlots alone comprise 30 cent of the commercial forest area. Sixty percent of the remaining timber is privately owned. Ninety percent of the potential forest wing capacity and 95 percent of the forest drain is on private lands.

Public measures for obtaining the best forest land use and the best ensity of management include public ownership, cooperation with private ers, and regulation of forest practices on private lands.

Public ownership at present extends to only 120 million acres of mercial forest lands, or about one-fourth of the areas best suited for ber production. Additional public lands with forest cover but suited marily for subsidiary uses other than timber production amount to about million acres. Most public timber lands are in national forests, al- gh state, community, and other federal ownerships are also important. e generally of less value than private forests, most public areas are r fairly intensive management for combinations of timber production, ding, recreation and other land uses.

Moderate increases in the area of public forests appear probable, icularly for low value, depleted, and tax delinquent lands. Other rshed and public recreational areas should also be publicly owned e returns are non-monetary and widely diffused. Public acquisition he 340 million acres of commercial forest lands in private ownership t present of little more than academic interest, however, in view of large transfer of funds that would be necessary.

Cooperation between public agencies and private landowners has me increasingly important, with public agencies resorting to subsidies btain better forest practices. Financial and other aids are given to ote forest protection, selective cutting, and permanent operations. lew of the public interests involved, this policy of assistance in rn for maintaining forest lands in productive condition should be inued. Providing more adequate protection from fires, insects, and ase through Federal and State agencies is not only economically feas- , but justified by social values in forest lands and in the case of n by responsibility of the public for causing heavy losses. A public m of low cost forest fire insurance would increase the security of te forest investments. Federal credits at low interest rates, ed along farm credit lines perhaps, could promote permanent forest stries. Taxation of forest land should be adjusted for sustained tions. Cooperative producing and marketing associations could be red as a means to better forest utilization. Research in forest oment and marketing should be continued.

In addition to public ownership and public assistance, regulations obtain desirable forest practices may be applied where needed. Reason- y effective public controls to insure slash disposal and fire protection e been initiated by various states. The short-lived NRA attempted to rove forest utilization practices through "industrial self-government", uniformity of regulation and control of minority elements was found to difficult. It is possible that additional public controls over forest may be necessary, similar perhaps to those in countries such as Sweden re intensive forest protection, approved cutting methods, and planting compulsory and accepted features of forestry. Costs in excess of those quick liquidation may be involved, but such expenses are borne by all est owners and become part of the timber supply price. The social phil- phy regarding regulation in the United States has not crystallized in or of complete public control over the use of natural resources. Trends zoning and urban regulations nevertheless indicate that public control r land utilization ultimately will replace the philosophy of laissez- re in order to protect social values in forests or other natural resources.

The best use of forest lands may thus be approached through classi- ations for alternative uses, for combinations of supplementary forest s, and for intensity of management. Such classifications should rest n economic analyses of the ultimate costs and benefits to all social ups. Land use policies involving a combination of public ownership, istance to private landowners, and public regulation of forest prac- es appear desirable in order to realize productive forests, profitable l stable industries, and permanent forest employment.

Discussion by Paul A. Eke
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of

THE BEST USE OF FOREST LANDS

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There are at least two features of this paper that make it of unal value to all those interested in land planning. The first is the play of goals which can be used as gauges of best use. These goals equally applicable to appraising or planning other land uses. Desable goals have been so much needed in many of the recent action grams that a review of those given here seems to be justified in the ht of giving them the emphasis which they deserve. A broad general tement of these goals is given in this paper. To get a more specific tement, I am quoting from the May, 1939 Journal of Farm Economics. this issue, David Weeks and H. R. Josephson list the following goals:

"1. Increased per-capita net real income.
2. Reduced dispersion of income.
3. Permanence of income."

These goals may well become the socio-economic philosophy of all nomic planners, particularly, of those dealing with land. One exple is, perhaps, sufficient. Trends in agriculture toward large hanized farm units, which frequently go far beyond the point of the st cost combination", could well be judged in the light of these als. A land use program emanating from such an application might be ther startlingly effective in solving the surplus population problems agriculture in areas which have the best farm lands. As a further ult, subsistence farming on cut-over forest lands might not then be ite so necessary for some people. The second feature is the optimism cerning sufficient growth of timber, together with mature stands to equately care for our immediate and distant future needs. This statent is a bright ray of light piercing the gloom which has been created most writers on this subject during the last twenty or thirty years. rhaps somewhat more emphasis should have been given to local exceptions. pletion and lack of sufficient growth prevail in areas nearest to market.

Statements concerning required intensity of management for forests different qualities are appropriately made. The theory of efficiency, acity, and productivity might well have been used in this connection. t public funds have not been spent on this basis is not over-emphasized. e rather poor national forests have had more than their share of pubc funds. In this connection, there seems to be a need for considering

fts in public expenditures from public to private forest lands. These enditures might be made to correspond with fulfillment of required restry practices on the part of private timber land owners. This would similar to payments to farmers for soil conserving practices under the ricultural Adjustment Administration.

Questions are raised concerning the advisability of using relief or for improvement of forests. This seems entirely proper. As an mple, it appears that this labor might in some instances be used more ductively in conserving human resources. This goal might result in proving subsistence communities found on cut-over lands by moving some them to the best available lands, making closer settlement, and build- roads and schools.

Statements on federal forest credits, fire insurance, and taxation form all sound familiar to the agricultural economist. There seems to no reason why similar measures might not be justified for forestry, rticularly, to promote farm and small-scale forestry.

Sawmill "over-capacity" might well have been discussed along with large element of monopoly price control which exists in many areas. of price competition among retailers is another matter of grave con- rn in respect to "over-capacity" of sawmills.

The relation of tariff manipulation to foreign lumber demand has en treated briefly. Perhaps one should add to this statement the need exchange by foreign nations if lumber is to be purchased from the ited States. This will involve lower industrial tariffs to permit ater importations. The lumber industry is, it appears, in about the position as wheat and cotton producers who must depend upon foreign les for a large part of their income. From the same sources inspiring o farmers to ask for higher tariffs, not a few lumbermen think that e cure for the evils of high tariffs is more high tariffs; particular- on their particular products.

Under the section entitled "Alternative Uses for Forest Lands", me consideration is given to settlement of cut-over lands for agri- ltural use. It is the conclusion that not much more will be cleared less, to quote, "the unemployment problem gets bad enough to force rtial reversion to pioneer conditions." The facts are that such con- tions now prevail and have prevailed since 1933. These lands are ing cleared now, by a local surplus of rural population, by drought- icken farmers from prairies, and by some unemployed industrial people. eap improved lands mean nothing to any of them since they have meagre ns with which to purchase. Farm lands in older areas reverting to ber may offset this new clearing, but this clearing will, no doubt, ntinue indefinitely.[1] There is a serious need of preventing exploita- on of these people by owners of cut-over lands, both as to prices asked

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[1] Recently Cooperative "Bulldozer" Associations have been formed throgh the Farm Security Administration, which are cutting costs of pulling stumps to one-fourth or less--as little as $7.00 per acre in northern Idaho.