The Implementation of Selective Logging

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Last fiscal year, we had in force 1,408 timber licenses covering 3.5 million hectares of forest areas. A large part of these areas are public forests. The licensees removed about 4.1 million cubic meters of timber and had correspondingly logged about 30,-000 hectares. At this rate of area logged with the general practice of leaving understocked or bare logged-over areas in the process of removing the marketable timber, we face the prospect of short supply of timber after the virgin forest will have been logged off. We will face as a consequence a drastic diminution of the lumber industry and other wood industries, because such areas will not contain enough growing stock for the succeeding cuts. We will face also the prospect of losing our wood market abroad for not having in the future sufficient stands of the Philippine Mahogany which has already a well-established foreign demand.

Such areas will lose their effectiveness to control and store water and protect the soil. The 3-1/2 million hectares will become an added problem of artificial planting in matters of success and cost.

To avert these prospective consequences. the government will see to it that within its limited means, henceforth, adequate residuals trees are left after logging. Control of logging through tree marking and use of proper methods and equipments; application of appropriate cutting rules; organization and training of forest officers and licensees' crews; fixing of definite areas of responsibility; inspection and supervision; and application of appropriate regulatory measures, are being undertaken for pursuing this determination. These, in a nutshell, are the ways and means of the selective logging program.

As a duty of the timber licensees and as a responsibility of the Bureau of Forestry, selective logging is a "must". To timber licensees who are geared to permanency of their business, this practice is a necessity. It is the surest and cheapest means of re-stocking our forests. Fortunately, the major portion our forests is suited to this system.

By "selective logging", we mean the removal of mature, over-mature and defective trees in such a manner as to leave uninjured an adequate number and volume of healthy residual trees of the commercial species and other tree species necessary to assure a future crop of timber and forest cover for the protection and conservation of soil and water. Adequate stands that we have in mind is a stand composed of uninjured young trees left as a result of exercising care by using the suitable techniques and equipments, commensurate with a fair margin of profit. At the outset, we do not require drastically that all immature trees shall not be destroyed. In fact, a part of the residual stand has to be sacrificed. As a start, we require, in general,

to be left in the logged-over areas a minimum stand of 60% of the number of trees in the 30 centimeter to 70 centimeter diameter group in the proportion that the stand structure will allow in the dipterocarp forests which constitute the major portion of our forests. Where the trees are predominantly in the merchantable diameter classes, at least some of the trees, the most vigorous (thrifty) ones, shall be left undamaged, the number to be not less than 40% of the entire stand (all trees 30 centimeters and over in diameter.)

This starting minimum requirement in dipterocarp forests is based on our experience in Basilan where we have been managing the forest there under an initial working plan for the last three years. Supervised logging studies and some growth figures there indicate that such a stand can be saved and may be capable of giving sufficient volume for a profitable second cut after 30 years. This period is tentatively adopted as the cutting cycle or the time elapsing between successive cuts in the same cutting area.

These young trees consist of poles and standards. We have not included young reproduction (saplings and seedlings) in the minimum percentage to be left undamaged, because they are in greater number and many of them can be saved along with the saving of bigger-sized trees.

For the pine and other types of forests and for objects of management other than sawtimber, some modifications will be made as to the diameter bases and percentage of minimum requirements.

Let us, at the outset, disabuse our minds of the short-sighted notion that there is no worry about replenishing the forest because plenty of reproduction comes out after uncontrolled logging. We should consider the objective of continuity of operation which could not be possible in most license areas where the virgin forest will be finished before seedlings now in the area will have matured eighty to a hundred years hence. Such license areas direly need bigger-sized trees but below exploitable diameter for residual growing stock.

Hence, the object of our program is to assure that adequate residual stands are left standing after logging.

Tree Marking and Improved Logging Techniques. — If there were no considerable damages in the process of felling and removal of mature trees, the trees uncut would be sufficient for a residual growing stock. However, the big and wide-spreading crowns of dipterocarps, the rough terrain encountered and carelessness of loggers concerned only with log production result in destruction or injury to the uncut trees. Therefore, it is necessary to control logging operations.

(1) Tree marking. — The method of controlling cutting is tree marking. As fast as possible, we will staff lumbering districts with especially trained men to initiate, guide and direct tree marking in logging areas. The loggers' attention should not be only on the logs to be removed but also on the trees desired and marked to be saved. These trees should be the object of "reverence" by the loggers. The advantage of marking trees to be left during this initial period are threefold: (1) to familiarize loggers on the kind, condition and quality of trees needed for residual growing stock; (2) by numbering the trees that are marked and recording species and estimated diameter and number of logs of each tree, the taking of inventory of residual growing stock for the purposes of forecasting future crop yields is facilitated; (3) the inventory of damaged marked trees for the basis of regulatory fines is also facilitated.

Tree marking is done by trained forest officers with the help of licensee's or company's crew. It is guided by the minimum requirements of residual stand. After determining the proper location of spar trees in consultation with the logging foreman and knowing the number of trees that will be marked as residual trees by the sampling method, actual tree marking in the setting commences, keeping in mind the following:

a. Staking of proposed cableways shall

be done before marking in high-lead settings so that trees desired to be left in these cableways shall not be marked.

b. In high-lead set-ups, top and side of ridges, especially if the ridges originate from the spar tree, marking of residual trees is heavily made.

c. On creek and gully bottoms to be used as main haul cable roads, marking of trees is minimized or nil.

d. In planned cableways other than creek or gully bottoms, residual trees need not be marked. The width of these cableways shall be kept to the minimum necessary for the passage of end-choked logs.

e. In tractor settings, trees to be left should be confined between proposed skidding trails.

f. The number of trees marked in the setting is given to the felling and yarding capatazes so that they will know the goal of trees to be saved by their crews in each cutting area.

A competent forest officer judges and and tallies the trees and is helped by one or two of the licensee or company men experienced in felling and skidding.

(2) Felling techniques and equipments found so far effective in minimizing damages are as follows:

a. Because of the tendency of fallers to follow the line of least resistance, felling is done following the lean of trees. However, in order to avoid injuries to the residual stand, leaning trees can be felled in three (3) directions other than the lean by leaving an angle-shaped uncut wood section which "pulls" away the trees from their leans when they fall. This uncut section serves as a hinge that throws the tree in the direction desired to avoid hitting trees for residual growing stock.

b. An erect and evenly-crowned tree can be felled, in a windless day, in any desired direction, hence the direction of fall can be in places where damage to the residual will be least.

c. Trees heavily branched or with forked branches on one side can be felled, like leaning trees, in any direction within a quarter-circle on either side of the tree to avoid injuries to marked trees.

d. Felling wedges shall be used for effective control of direction of fall of big trees to save residual trees. Licensees must equip each pair of fallers with at least two (2) felling wedges.

e. In high-lead set-ups, trees to be cut shall be felled diagonally to the contours (preferably towards the spar tree) and be accessible to yarding cables in creek and gully bottoms to prevent too much sweep of logs. Creek and gully bottoms, if they originate from the spar trees, shall serve as cableways. As much as possible in other cable roads, should the position of standing trees warrant, trees should be felled parallel or diagonal to said cableways.

f. Trees shall be felled away from residual trees and clumps of young forest growth and not into or across such clumps.

g. In tractor set-up, as much as possible, felling of trees to be cut shall be done perpendicular to the main tractor roads. This facilitates the pulling out of logs to the tractor roads and avoid si-washing around or sweeping down marked trees or groups of young trees.

At present in most felling operations, the felling damage is great, as much as 15% of the entire stand. This could be reduced to 10% and even lower.

(3) Yarding and skidding techniques. — Yarding techniques tried and found so far to be effective in minimizing damages are the following:

a. To prevent destruction on promontory ridges and slopes, bullblock placed at the middle of the half-moon's loop should be used. This will save young trees on the slope from being wiped out during yarding due to the downward sweeping force of the uncontrolled logs being yarded.

b. To reduce the number of cableways in a set-up, extended chokers should be used to reach isolated logs felled between major cableways. Rub trees of non-commercial species must, however, be used as

shield of residual crop trees from being swept down or severely injured.

c. To minimize the maximum rolling of logs in side-hill yarding, logs shall be strategically placed along cableway on slope and infront on the cable side of marked trees to guide logs and shield marked trees along the cableways.

d. In tractor set-ups, skidding shall be confined to skidding trails and backtrip trails previously laid as straight as possible yet avoiding clumps or groups of residual trees and forest growths in going to and from the landing instead of letting tractor operators penetrate the set-ups in any direction they desire which results to more trees damaged in the many paths.

e. Areas of level to moderate topography comprising not less than 5 hectares shall not be logged by high-lead.

f. Compensation shall be made for designated trees to be left that maybe found later to be unavoidably damaged by equivalent undesignated trees.

Equipments. The kind and power of yarding and skidding equipments have much to do in the extent of damage to the residual stand. The use of steam engines is not favored because of the sudden impact of power at the instant of the throttle. They use the power of the engine to overcome obstructions most of which are the standing trees we want to save. Diesel engines which develop power steadily are preferred in high-lead yarding as it is easier to control the speed of yarding cables when trees on the way are to be avoided. These engines should of course have as low a power as possible. One hundred fifty (150) effective horsepower is set as the maximum allowed in yarding, to begin with. Observations have shown that more than this power will cause greater destruction. In swinging, more than this power can be used, provided the system lifts the log entirely off the ground while in transit to the head spar tree.

Possible other Techniques and Equipments that may be developed. With their ingenuity, loggers could adopt or develop other techniques that are just as or more effective than those described. For example, we may return to the old system of ground-lead yarding with the use of more bull-blocks as a good means of controlling the logs in transit. A hybrid of the WYSSEN and TYLER systems may be developed whereby the carriage can be used at intermediary points along the skyline for yarding on both sides of the skyline. By this prospective method, side-sweeping of trees towards the head spar trees can be minimized.

Right-of-Way Clearings. — Clearings along right-of-way for logging roads can be a source of much unnecessary loss of young trees, especially on rough country where long winding roads and big cuts are necessary to reduce the grade. Aside from the roadbed, logging operators want to totally clear wide strips on both sides of the road for sun-drying the road. This is resorted to by loggers who do not or cannot construct their roads well in advance of yarding operation and are thus forced to use prematurely ill-surfaced roads. This practice should be discouraged. The Bislig Bay Lumber Company in Surigao where there are heavy rains have narrow or no clearings along main roads, because they construct ahead, surface and drain well their roads. We limit such clearings within the roadway and require selected thrifty trees to be left uninjured on the remaining width of the right-of-way. The right-of-way shall not be more than 15 meters on each side from the center line of the road.

Authority and orders from licensee or official of company to logging crews. — One of the important requisites for the success of selective logging is for the licensee or head of the company to give written orders to logging keymen and workers to adopt the logging techniques and equipments necessary for saving trees for residual growing stock and other measures which the timber management officers will from time to time suggest. For the licensees' forestry crew, this should include a set of instructions em-

bodying marking rules prescribed by the Bureau of Forestry. The licensee or head of the company should accordingly give written authority to the manager, thence to logging superintendent down to the head of the forestry crew (working side by side with forest officers) to require logging crews to apply such techniques, equipments and other measures to save residual trees from destruction and injuries. There must also be an order from the licensee or proper official of the company to all logging men to follow suggestion of timber management officers and head of forestry crew.

A great incentive of saving more residual trees is the awarding of bonuses to loggers for leaving certain excess of the desired number of residual trees for each setting and imposition of penalties for shortage of or carelessly damaged residual trees in the course of felling and yarding.

Forest Officer's Responsibility. — District foresters are forest managers of their districts and they are held responsible for the observance of selective logging in their districts. We are gradually re-enforcing them in the order of activity and extent of license areas covered with specially trained forest officers who shall be responsible among others, for (1) training forest officers in tree marking and residual inventories, (2) organization and training of licensees' forestry crew, and (3) supervision and checking of logged-over areas as to adequacy of residual stands. Officers in Charge of stations properly trained shall be assigned definite areas of responsibility for selective logging.

Training. — A training program for timber management assistants is being conducted in Basilan City where we have the first dipterocarp forest working circle managed under a working plan. The District Foresters of Zamboanga del Sur, Agusan, Cotabato and Surigao are already provided with specially trained men for timber management. Closer supervision of licensees' operations are conducted in these districts. The other lumbering districts will be provided with timber management assistants as quickly as possible. We will soon conduct a workshop-seminar for forestry crews of important timber licensees in Agusan and for officers in charge who are timber management officers of their respective jurisdiction. We will have a siminar workshop-seminar in other lumbering regions as soon as we will have staffed these districts with timber management assistants.

Inspections. — In order to insure that adequate stands are left, a system of inspection and checking is conducted. The timber management assistant has the duty of inspecting all logged-over areas as to whether or not the desired residual stand have been left. He will be responsible to the district forester. He shall have authority to stop on the spot a phase of logging operation which, if continued, will cause serious and extensive destruction of residual stands. The Officers in Charge of stations who are also timber management officers are responsible for adequate stands left in the license area under him. Five forestry supervisors stationed at strategic places shall have overall supervision over timber management assistants through the district forester in their respective regions. The forestry supervisor for timber management plans and selective logging in the Manila Office shall coordinate and check the work of supervisors; he shall also see to the coordination of selective logging and management plan operations to achieve sustained yield for specific forest tracts.

Penalties. — We rely on the licensees to do their part, because after all, their operation ultimately is responsible for the kind and condition of the forest left after logging. Until the logging crews will have been accustomed to doing good practices, they are likely to continue on their careless practices. Hence, certain regulatory penalties will have to be applied. Among these are the following:

a. A fine of four times the regular forest charges on trees designated to be left as

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