

Administrative Order

No. 28

May 10, 1993

SUBJECT : Conduct of Residual Forest Inventory in Areas Logged by Active TLA Holders within their Operable Second Growth Forests

Pursuant to Section 22, P.D. 705 as amended and DENR Administrative Order (DAO) No. 12, Series 1992 and in order to enhance the sustained-yield management of the operable second growth forest, the following regulations and guidelines on the conduct of residual forest inventory are hereby issued for the information and guidance of all concerned:

Section 1. Definition of Terms

The following terms as used in this Order shall be understood and interpreted as hereunder defined:

- 1.1 **Adequately Stocked Residual Forest** - Natural grown forest that contains at least 20 healthy and sound trees per hectare of the preferred species, (i.e. common hardwoods, premium species and construction and furniture woods) having diameter of 15 cm and larger.
- 1.2 **Healthy Residuals** - Trees belonging to the preferred species with dbh/dab of 20-60 cm having straight and cylindrical bole with no or minimal injury/damage to its root systems, buttresses, trunks and crowns.
- 1.3 **Residual Forest Inventory** - the physical examination of the trees left after logging, particularly the marked trees for purposes of determining the condition, extent and cause(s) of damage/injury on the root system, buttress, trunk and crown, and the area totally damaged resulting from the harvesting or merchantable trees.
- 1.4 **Selective Logging** - is the systematic removal of the mature/overmature and defective trees in such a manner as to leave adequate number and volume of healthy residual trees of the preferred species necessary to ensure a future crop of timber and forest cover for the protection and conservation of soil, water and wildlife.

- 1.5 **Set-up** - is the smallest subdivision of a forest block which is delimited for the orderly harvesting and removal of merchantable trees in order to minimize the damage/injury to the remaining forest stand.
16. **Tree Marking** - is the process of marking trees to be harvested and those to be left as residuals which will form the future crop of timber.

Section 2. Objectives of Residual Inventory

- 2.1 To classify the type of standing trees left after logging;
- 2.2 To determine the causes of damage/injury done on marked and unmarked trees for purposes of correcting/ minimizing the occurrence of such damages/injuries;
- 2.3 To obtain data on damaged/injured trees to be used as basis in imposing the corresponding fines and other penalties;
- 2.4 To obtain data/information for the prediction of tree mortality, yield/volume and silvicultural treatments;
- 2.5 To check the accuracy of tree marking intensity; and
- 2.6 To determine the extent of area damaged in the process of logging.

Section 3. Period of Undertaking Residual Forest Inventory.

The residual forest inventory shall cover areas logged in 1992 and thereafter, to provide data for the modification of the present AAC formula (DAO No. 12, S. 1992). For 1994 and subsequent years, the inventory shall be conducted immediately after a set-up is completely logged.

Section 4. Assignment of Technical Personnel

- 4.1 Foresters of DENR field offices shall be assigned to conduct the residual inventory. However, foresters from the CENRO who have jurisdiction over the TLA area(s) may not be assigned to undertake residual inventory thereat for obvious reason, provided it shall not entail operational and financial problems to the office concerned.
- 4.2 FMB foresters shall periodically monitor/validate the tree marking and residual inventory conducted by the field offices to ensure the proper implementation of Selective Logging activities.

Section 5. Procedures/Methods

The team who may be assigned to undertake the residual forest inventory shall perform the following tasks:

5.1 Physical Examination of logged area

- 5.1.1 Take note of the equipment used by the Company for log transport (6 x 6, trailer, etc), and for yarding/skidding (tractor, wreckers, wheeled skidders, etc.)
- 5.1.2 Obtain from the concerned DENR field office a copy of the approved Integrated Annual Operations Plan (IAOP) for the year/period under review and the tree marking records of the set-ups that shall be evaluated.
- 5.1.3 Copy the tree marking data i.e. species, corresponding tree number, diameter and merchantable height from the tree marking record to R.I. form No. 01.
- 5.1.4 Proceed to the logging area of subject licensee and determine if the area logged is within the approved annual cutting area (ACA) as programmed in the IAOP.
 - 5.1.4.1 If the area is verified to be outside the ACA, take note of the deviation and proceed with 5.1.5 below. Prepare a comprehensive report about the deviation to be submitted separately to the DENR Secretary thru the FMB Director and/or concerned Regional Executive Director.
 - 5.1.4.2 If the area logged is within the approved ACA, proceed as indicated in 5.1.5 below.
 - 5.1.4.3 In either of the above cases, determine the area that is totally destroyed in felling and/or yarding/skidding or road construction, indicating the length and breath of the area destroyed.

5.1.5 Locate each marked tree as listed in RI Form 01 and determine its actual condition and classify it in accordance with the tree classification as shown in Appendix II. The damaged/injured tree category shall include knocked-down and missing trees but should be classified as such on the record sheet.

5.1.5.1 Check the actual DBH/DAB of each marked tree. If the tree marking record indicate only the diameter class, measure the actual DBH/DAB and record the measurement of the tally sheet. Likewise, the actual merchantable height of each marked tree should be measured and recorded accordingly.

5.2 Marking Goal Check

After the physical evaluation of the marked trees in all the logged set-ups is completed, conduct a five percent (5%) sampling check within each set-up to determine if the number of trees to be left is in accordance with the prescribed marking goal pursuant to Section 4, DAO 12. The sampling check is carried out by establishing 1/10 hectare circular or rectangular plot. Circular plot has a radius of 18 meters while rectangular plot has a dimension of 20m x 50m.

The number of 1/10 hectare plot at 5% intensity is determined by dividing the area of the set-up by two (2).

5.2.1 The computed number of plots should be distributed evenly within the forested portion of the set-up in order to get a realistic representation of the timber stand thereon.

5.2.2 Identify the species and measure the actual DBH/DAB to the nearest cm and merchantable height to the nearest meter of all trees within the plot having diameter of 15 cm and larger.

5.2.3 Determine the tree class of each tallied tree in accordance with the classification as described in Appendix II. The damaged category should be classified into: a) standing, and b) knocked-down.

5.2.4 If there are stumps found within the plot measure its diameter and record the measurement on the tally sheet and indicate under REMARKS that it is a stump.

5.3 Data Analysis and Compilation

5.3.1 Marked Trees:

- 5.3.1.1 Analyze the data/information obtained from the 100% physical examination of all marked trees in order to determine the performance of the TLA holder(s) in Selective Logging.

The number of healthy residuals left within the set-up shall be determined by diameter class in conformity with the prescribed marking goal (MG). The residual recovery shall be expressed as percent of the total trees for a particular diameter class, which is calculated based on the following formula:

$$\% \text{ HR} = \frac{\text{No. of HR by Diameter Class}}{\text{TNT of the same Diameter Class}} \times 100$$

where: HR = Healthy Residuals
TNT = Total Number of Trees

- 5.3.1.2 Summarized the marked trees by diameter class, tree classification and set-up recorded on RI Form 01 to the Summary Table RI Form 02.
- 5.3.1.3 Prepare a consolidated summary for all the set-ups evaluated in a similar tabulation (RI Form 02).

5.3.2 Marking Goal Computation:

- 5.3.2.1 Analyze the data obtained from the 5% sampling check in order to determine the adequacy of the marked tree to be left in accordance with MG factor as prescribed in DAO 12, S, 1992 as indicated hereunder, to wit:

MG = 0.70 of trees 20 cm dbh/dab,
+ 0.75 of trees 30 cm dbh/dab,
+ 0.80 of trees 40 cm dbh/dab,
(0.85 for Palawan and Region 8)
+ 0.85 of trees 50 cm dbh/dab,

(0.50 for Palawan and Region 8)
+0.50 of tree 60 cm dbh/dab.

- 5.3.2.2 Prepare a stand and stock table for all trees regardless of tree classification by species group and diameter class.
- 5.3.2.3 Prepare another stand and stock table based from the actual tree classification (i.e. healthy, doubtful/substandard and damaged. The damage category shall be further classified into standing and knocked-down) by species group and diameter class.
- 5.3.2.4 Determine the species group of the marked tree to be left copied from the tree marking records of the CENRO which were verified/examined in the field. If the marked trees belong to the common hardwood species only, copy its corresponding stand per ha from the stand and stock table prepared from the 5% sampling check and record these data under column (2) and (3) on RI Form 03 (Appendix IV). Proceed with the necessary computations in accordance with the instruction indicated on the bottom portion of RI Form 03.
- 5.3.2.5 Summarized the tree classification by set-up, species group and diameter class in RI Form 04 (format is shown in Appendix V).
- 5.3.2.6 Prepare a consolidated summary for all the set-ups evaluated in a similar tabulation (RI Form 04).

5.4 Summary of Results

The results obtained from the 100% physical examination of marked trees to be left and the 5% sampling check on the accuracy of marking goal (MG) in all the set-ups evaluated shall be summarized.

5.4.1 Performance on Healthy Residual Recovery

The performance rating of the TLA holder(s) on healthy residual recovery shall be expressed both in adjectival and percent as follows:

5.4.1.1 Excellent Performance on Marked Healthy Residual Recovery

DIAM. PALAWAN & R-8 CLASS	OTHER AREAS (PERFORMANCE RANGE)	RATING (PERCENT)
20	70% or more	100
30	75% or more	100
40	80% or more	100
50	85% or more	100
-	50% or more	100

5.4.1.2 Good Performance on Marked Healthy Residual Recovery

DIAM. PALAWAN & R-8 CLASS	OTHER AREAS (PERFORMANCE RANGE)	RATING (PERCENT)
20	60% - 69%	85
30	65% - 74%	85
40	70% - 79%	85
50	75% - 84%	85
-	45% - 49%	85

5.4.1.3 Fair Performance on Marked Healthy Residual Recovery

DIAM. PALAWAN & R-8 CLASS	OTHER AREAS (PERFORMANCE RANGE)	RATING (PERCENT)
20	50% - 59%	70
30	55% - 64%	70
40	60% - 69%	70
50	65% - 74%	70
-	40% - 44%	70

5.4.1.4 Poor Performance on Marked Healthy Residual Recovery

DIAM. CLASS	PALAWAN & R-8 (PERFORMANCE RANGE)	OTHER AREAS (PERFORMANCE RANGE)	RATING (PERCENT)
20	40% - 49%	40% - 49%	55
30	45% - 54%	45% - 54%	55
40	55% - 64%	50% - 59%	55
50	35% - 39%	55% - 64%	55
-	-	35% - 39%	55

5.4.1.5 Very Destructive Performance on Marked Healthy Residual Recovery

DIAM. CLASS	PALAWAN & R-8 (PERFORMANCE RANGE)	OTHER AREAS (PERFORMANCE RANGE)	RATING (PERCENT)
20	39% - or less	39% - or less	40
30	44% - or less	44% - or less	40
40	54% - or less	49% - or less	40
50	34% - or less	54% - or less	40
-	-	34% - or less	40

If the percent of healthy residual recovery by diameter class varies, add the percent ratings and divide the sum by the number of diameter classes.

Example:

DIAM. CLASS	PALAWAN & R-8 (PERFORMANCE RANGE)	OTHER AREAS (PERFORMANCE RANGE)	RATING (PERCENT)
20	75%	100	Excellent
30	66%	85	Good
40	60%	70	Fair
50	70%	70	Fair
60	30%	40	Destructive
TOTAL		365	

% Rating = $365/5 = 73\%$ = Fair Performance

5.4.2 Area Damaged/Cleared

Tabulate the areas damaged/cleared during the logging operations and summarized the data by set-ups as indicated on RI Form 05, the format of which is shown in Appendix VI.

Section 6. Report Preparation/Submission:

- 5.1 The report on the results of the residual forest inventory shall be submitted by the team to the Secretary thru the FMB Director within ten (10) days upon completion of the fieldwork
- 6.2 The report shall include the following:
 - 6.2.1 Duly accomplished RI Form Nos. 01,02,03,04 and 05 including the stand and stock tables based from the results of the 5% sampling check.
 - 6.2.2 Summary of the results on a) healthy residual recovery by diameter class, b) number and volume of damaged trees by diameter class and, c) comparative data on tree marking obtained by the CENRO and those of the team.
- 6.3 The report shall be signed under oath by all team members.

Section 7. Report Evaluation

The submitted residual forest inventory reports shall be evaluated by the Ad Hoc Committee. Reports submitted to them shall be their basis in determining the accountabilities, if any, of all concerned timber management personnel, inventory teams, CENROs, PENROs, RTDs, REDS and timber licensees.

Section 8. Creation of Ad Hoc Committee

An Ad Hoc Committee shall be created by the DENR Secretary to determine the reliability of the reports and liability, if any, of concerned timber management personnel, inventory teams, CENROs, PENROs, RTDs and REDs who shall have direct and/or command responsibilities over the said activity/function. Likewise, the committee shall look into the performance of TLA holders in tree marking compliance, healthy residual recovery and extent of area damaged as a result of the logging operations, including the sanctions that may be imposed. The FMB Director shall act as Chairman of the Committee and the members shall further be determined by DENR Officials.

Section 9. Penal Provisions

All concerned timber management personnel, inventory teams, and officials of the DENR and timber licensees found to be negligent in the proper implementation of selective logging shall be administratively liable of the offense enumerated below and shall be penalized accordingly. The penalties of DENR personnel/officials shall be in consonance with Civil Service Commission Memorandum Circular No. 30, Series of 1989.

9.1 Inadequate or Non-Marking of Residual Trees.

Any DENR timber management personnel directly or indirectly involved in tree marking activities who are found not following or implementing the prescribed tree marking regulations resulting to inadequate or non-marking of residual trees as prescribed under Section 4, DAO 12, Series of 1992, shall be suspended from office for not less than one (1) month and one (1) day but not more than six (6) months for the first offense and dismissal from the service for repetition of similar offense.

9.2 Negligence for non-conduct of Residual Inventory. - The concerned CENROs, PENROs, RTDs, and REDs who are found guilty of negligence in the non-conduct of residual forest inventory as prescribed in this Order shall be suspended from office for not less than one (1) month and one (1) day but not more than six (6) months.

9.3 Submission of Spurious Report. - Inventory teams whose reports are verified to be spurious shall be dismissed from the service.

9.4 Destructive Logging Operations. - When the logging operations of the TLA holder(s) is found to be destructive based from the results of the residual forest inventory, the licensee shall be penalized as follows:

9.4.1 Payment of fines at four (4) times the regular forest charges per cubic meter on damaged marked trees to be left;

9.4.2 Suspension of the logging operations for at least three (3) months, including payment of fines for damaged marked trees to be left; if the tree marking of residual trees is inadequate and/or if the performance in healthy residual recovery is POOR; and

- 9.4.3 Cancellation of the TLA and confiscation of bond in favor of the government, including payment of fines for damaged marked trees to be left; if there is no tree marking within the area(s) logged and/or if the performance in healthy residual recovery is VERY DESTRUCTIVE.

Section 10. Repealing Clause:

All DENR Administrative and Memorandum Orders, Circulars and other Administrative Issuances inconsistent with this Order are hereby deemed revoked, amended or revised accordingly.

Section 11. Effectivity

This Order takes effect after fifteen (15) days from its publication in a newspaper of general circulation.

ANGEL C. ALCALA
Secretary