Resource Inventory Notes

BLM 21 May 1979

# Metrification of Mesavage's Form Class 78 and 80 Cubic-Foot Volume Tables

by

Curt C. Hassler
and
Michael S. Fountain[1/]

Abstract:

Mesavage's form class 78 and 80 cubic-foot volume tables, for sawtimber and pulpwood, are converted to cubic-meters. Sawtimber volumes include all even diameters, 30 cm - 100 cm, by ½ logs. Pulpwood volumes include all even diameters, 12 cm - 30 cm, by even height classes, 4 m - 20 m.

The conversion of existing English volume tables to their metric equivalent has not been at the forefront of forestry concerns. As a nationwide conversion to the metric system approaches, we must begin to adapt our mensurational frame-work to this change.

The volume tables developed by Mesavage (1947) have been extensively adopted for use in the U. S. and especially in the South. This paper focuses on the conversion of the most commonly used Mesavage cubic-foot volume tables, form classes 78 and 80 into cubic meter volume tables.

## Table Construction

It is assumed, for practical reasons, that metrification will not alter the basic mensurational approach to log scaling. A 1-log tree will remain a 1-log tree, but will be scaled as 4.88 meters rather than 16 feet.

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[1/] Curt C. Hassler and Michael S. Fountain are, respectively Research Associate and Assistant Professor, Department of Forestry, University of Arkansas at Monticello, Monticello, AR 71655

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Since even cm diameter classes are desired for a metric volume table, two alternatives are available for treating the Mesavage English tables used in formulating these volumes. One is to interpolate them initially for even cm diameter classes and the other to carry through with these tables in their metric equivalent, then interpolate. The latter alternative was chosen. The procedure used for converting sawlog volumes requires two steps:

(1) Follow Mesavage's procedure for determining sawlog volumes using the metric equivalents of even diameter classes, in inches (1" = 2.54 cm).

(2) Interpolate the results of step (1) for even cm diameter classes (30 cm - 100 cm). This is accomplished by fitting a cubic regression equation (i.e., volume = $a + b(dbh) + c(dbh)^2 + d(dbh)^3$) to the metric volumes and diameters from step (1), for 1, 2, 3, 4 and 5 log trees. Even cm diameter classes can then be solved for by substitution into the appropriate formula. The $r^2$ values for these equations were all > .9999. Half logs were interpolated utilizing the same procedure used in Mesavage's tables. Tables 3 and 4 present the metric sawlog volume tables for form classes 78 and 80, respectively.

The pulpwood volume table conversion required a three step process:

(1) Follow Mesavage's procedure and determine the pulpwood volumes using the metric equivalents of even diameter classes, in inches and height, in four foot increments.

(2) Interpolate for even meter height classes (4 m - 20 m) using a straight line, linear regression (i.e., volume = $a + b(height)$), and the metric volumes and heights from step (1). As a result of Mesavage's procedure for calculating upper stem pulpwood volumes these regressions are perfect fits (i.e., $r^2 = 1.0$).

(3) Interpolate for even cm diameter classes (12 cm - 30 cm) using a cubic regression equation (i.e., volume = $a + b(dbh) + c(dbh)^2 + d(dbh)^3$) and the metric volumes and diameters from step (2). All $r^2$ values were > .9999.

Tables 1 and 2 present the metric volume tables for pulpwood, form classes 78 and 80 respectively.

## References


(1) Mesavage, Clement. 1974. Tables for estimating cubic-foot volume of timber. U.S. Forest Service, Southern Forest Expt. Station, Occasional Paper 111. 70 pp.

(2) Mesavage, Clement and J. W. Girard. 1956. Tables for estimating board foot content of timber. U. S. Forest Service, Washington, D.C. 94 pp.

Table 1. Cordwood volume (cubic-meters, inside bark) by length of merchantable stem for Form Class 78 trees.

| Tree Diameter (cm) | Merchantable Height (meters) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 12 | .036 | .048 | .060 | .072 | .084 | .096 | .108 | .120 | .132 |
| 14 | .048 | .063 | .079 | .094 | .110 | .126 | .141 | .157 | .172 |
| 16 | .061 | .080 | .100 | .119 | .139 | .158 | .179 | .197 | .217 |
| 18 | .076 | .100 | .124 | .147 | .171 | .194 | .218 | .242 | .265 |
| 20 | .094 | .122 | .150 | .177 | .205 | .233 | .261 | .288 | .317 |
| 22 | .114 | .146 | .178 | .210 | .242 | .275 | .307 | .339 | .371 |
| 24 | .136 | .173 | .209 | .245 | .282 | .318 | .355 | .391 | .428 |
| 26 | .160 | .201 | .242 | .283 | .323 | .364 | .405 | .446 | .486 |
| 28 | .187 | .232 | .277 | .322 | .367 | .412 | .457 | .502 | .547 |
| 30 | .216 | .265 | .314 | .363 | .412 | .461 | .510 | .559 | .608 |

Table 2. Cordwood volumes (cubic-meters, inside bark) by length of merchantable stem for Form Class 80 trees.

| Tree Diameter (cm) | Merchantable Height (Meters) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 12 | .038 | .051 | .064 | .076 | .089 | .101 | .114 | .126 | .139 |
| 14 | .050 | .066 | .083 | .099 | .115 | .132 | .148 | .165 | .181 |
| 16 | .064 | .084 | .105 | .125 | .146 | .166 | .187 | .207 | .228 |
| 18 | .080 | .105 | .130 | .154 | .179 | .204 | .229 | .254 | .279 |
| 20 | .099 | .128 | .157 | .187 | .216 | .245 | .274 | .304 | .333 |
| 22 | .119 | .153 | .187 | .221 | .255 | .289 | .322 | .356 | .390 |
| 24 | .142 | .181 | .219 | .258 | .296 | .334 | .373 | .411 | .449 |
| 26 | .167 | .210 | .253 | .296 | .339 | .382 | .425 | .467 | .510 |
| 28 | .195 | .241 | .289 | .336 | .383 | .431 | .478 | .525 | .572 |
| 30 | .225 | .274 | .326 | .377 | .428 | .480 | .532 | .583 | .635 |

Table 3. Gross sawlog volume (cubic-meters, inside bark) for Form Class 78 trees, where one log is equivalent to 16 feet or 4.88 meters.

| Tree Diameter (cm) | Number of logs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 |
| 30 | .237 | .326 | .415 | .482 | .549 | .600 | .650 | --- | --- |
| 32 | .268 | .370 | .471 | .549 | .626 | .686 | .746 | --- | --- |
| 34 | .302 | .417 | .532 | .621 | .710 | .780 | .849 | --- | --- |
| 36 | .338 | .468 | .597 | .698 | .799 | .879 | .958 | --- | --- |
| 38 | .376 | .521 | .666 | .780 | .893 | .984 | 1.074 | --- | --- |
| 40 | .417 | .578 | .739 | .867 | .994 | 1.096 | 1.197 | --- | --- |
| 42 | .461 | .639 | .817 | .959 | 1.100 | 1.214 | 1.328 | --- | --- |
| 44 | .508 | .704 | .899 | 1.056 | 1.213 | 1.339 | 1.465 | --- | --- |
| 46 | .555 | .770 | .985 | 1.158 | 1.331 | 1.471 | 1.610 | --- | --- |
| 48 | .606 | .841 | 1.076 | 1.266 | 1.455 | 1.608 | 1.761 | --- | --- |
| 50 | .660 | .916 | 1.171 | 1.379 | 1.586 | 1.753 | 1.920 | 2.060 | 2.199 |
| 52 | .717 | .994 | 1.270 | 1.496 | 1.722 | 1.905 | 2.087 | 2.242 | 2.397 |
| 54 | .775 | 1.075 | 1.374 | 1.619 | 1.864 | 2.063 | 2.261 | 2.432 | 2.603 |
| 56 | .837 | 1.160 | 1.482 | 1.748 | 2.013 | 2.228 | 2.442 | 2.631 | 2.819 |
| 58 | .901 | 1.248 | 1.594 | 1.881 | 2.167 | 2.399 | 2.631 | 2.837 | 3.043 |
| 60 | .968 | 1.340 | 1.711 | 2.020 | 2.328 | 2.578 | 2.827 | 3.052 | 3.277 |
| 62 | 1.038 | 1.435 | 1.832 | 2.163 | 2.494 | 2.763 | 3.031 | 3.276 | 3.520 |
| 64 | 1.110 | 1.534 | 1.958 | 2.313 | 2.668 | 2.955 | 3.242 | 3.507 | 3.772 |
| 66 | 1.185 | 1.637 | 2.088 | 2.468 | 2.847 | 3.155 | 3.462 | 3.748 | 4.034 |
| 68 | 1.262 | 1.743 | 2.223 | 2.628 | 3.032 | 3.361 | 3.689 | 3.997 | 4.304 |
| 70 | 1.342 | 1.853 | 2.363 | 2.794 | 3.224 | 3.574 | 3.924 | 4.254 | 4.584 |
| 72 | 1.426 | 1.967 | 2.507 | 2.965 | 3.423 | 3.795 | 4.167 | 4.520 | 4.873 |
| 74 | 1.511 | 2.083 | 2.655 | 3.141 | 3.627 | 4.023 | 4.418 | 4.795 | 5.171 |
| 76 | 1.600 | 2.204 | 2.808 | 3.323 | 3.838 | 4.258 | 4.677 | 5.078 | 5.479 |
| 78 | 1.691 | 2.329 | 2.966 | 3.511 | 4.056 | 4.500 | 4.944 | 5.370 | 5.795 |
| 80 | 1.785 | 2.457 | 3.128 | 3.704 | 4.280 | 4.750 | 5.219 | 5.670 | 6.121 |
| 82 | 1.882 | 2.589 | 3.295 | 3.903 | 4.510 | 5.007 | 5.503 | 5.980 | 6.457 |
| 84 | 1.982 | 2.725 | 3.467 | 4.107 | 4.747 | 5.271 | 5.795 | 6.298 | 6.801 |
| 86 | 2.085 | 2.865 | 3.644 | 4.318 | 4.991 | 5.543 | 6.095 | 6.625 | 7.155 |
| 88 | 2.190 | 3.008 | 3.825 | 4.533 | 5.241 | 5.822 | 6.403 | 6.961 | 7.519 |
| 90 | 2.298 | 3.155 | 4.011 | 4.755 | 5.498 | 6.109 | 6.720 | 7.306 | 7.892 |
| 92 | 2.409 | 3.305 | 4.201 | 4.981 | 5.761 | 6.404 | 7.046 | 7.660 | 8.274 |
| 94 | 2.523 | 3.460 | 4.397 | 5.214 | 6.031 | 6.706 | 7.380 | 8.023 | 8.665 |
| 96 | 2.640 | 3.619 | 4.597 | 5.453 | 6.308 | 7.015 | 7.722 | 8.394 | 9.066 |
| 98 | 2.760 | 3.781 | 4.802 | 5.697 | 6.592 | 7.333 | 8.074 | 8.775 | 9.476 |
| 100 | 2.883 | 3.948 | 5.012 | 5.947 | 6.882 | 7.658 | 8.434 | 9.165 | 9.896 |

Table 4. Gross sawlog volume (cubic-meters, inside bark) for Form Class 80 trees, where one log is equivalent to 16 feet or 4.88 meters.

| Tree Diameter (cm) | Number of logs | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 |
| 30 | .245 | .339 | .432 | .504 | .575 | .527 | .678 | --- | --- |
| 32 | .278 | .385 | .492 | .575 | .657 | .719 | .781 | --- | --- |
| 34 | .313 | .435 | .556 | .651 | .745 | .818 | .891 | --- | --- |
| 36 | .351 | .488 | .625 | .733 | .840 | .924 | 1.008 | --- | --- |
| 38 | .392 | .545 | .698 | .819 | .940 | 1.036 | 1.132 | --- | --- |
| 40 | .435 | .605 | .775 | .911 | 1.047 | 1.155 | 1.263 | --- | --- |
| 42 | .481 | .669 | .857 | 1.008 | 1.159 | 1.280 | 1.401 | --- | --- |
| 44 | .530 | .737 | .943 | 1.111 | 1.278 | 1.413 | 1.547 | --- | --- |
| 46 | .581 | .808 | 1.034 | 1.219 | 1.403 | 1.552 | 1.700 | --- | --- |
| 48 | .635 | .882 | 1.129 | 1.332 | 1.534 | 1.698 | 1.861 | --- | --- |
| 50 | .691 | .960 | 1.229 | 1.450 | 1.671 | 1.850 | 2.029 | 2.177 | 2.324 |
| 52 | .750 | 1.042 | 1.333 | 1.574 | 1.815 | 2.010 | 2.205 | 2.371 | 2.536 |
| 54 | .812 | 1.127 | 1.442 | 1.704 | 1.965 | 2.177 | 2.388 | 2.573 | 2.757 |
| 56 | .876 | 1.216 | 1.555 | 1.838 | 2.121 | 2.350 | 2.579 | 2.783 | 2.987 |
| 58 | .943 | 1.308 | 1.672 | 1.978 | 2.283 | 2.530 | 2.777 | 3.001 | 3.225 |
| 60 | 1.012 | 1.403 | 1.794 | 2.123 | 2.451 | 2.718 | 2.984 | 3.228 | 3.472 |
| 62 | 1.084 | 1.503 | 1.921 | 2.274 | 2.626 | 2.912 | 3.198 | 3.464 | 3.729 |
| 64 | 1.159 | 1.605 | 2.052 | 2.430 | 2.807 | 3.114 | 3.420 | 3.707 | 3.994 |
| 66 | 1.236 | 1.712 | 2.187 | 2.591 | 2.995 | 3.323 | 3.650 | 3.959 | 4.268 |
| 68 | 1.316 | 1.822 | 2.327 | 2.758 | 3.189 | 3.538 | 3.887 | 4.220 | 4.552 |
| 70 | 1.398 | 1.935 | 2.472 | 2.931 | 3.389 | 3.761 | 4.133 | 4.489 | 4.844 |
| 72 | 1.483 | 2.052 | 2.620 | 3.108 | 3.596 | 3.992 | 4.387 | 4.767 | 5.146 |
| 74 | 1.571 | 2.173 | 2.774 | 3.292 | 3.809 | 4.229 | 4.649 | 5.054 | 5.458 |
| 76 | 1.661 | 2.297 | 2.932 | 3.480 | 4.028 | 4.474 | 4.919 | 5.349 | 5.779 |
| 78 | 1.754 | 2.424 | 3.094 | 3.674 | 4.254 | 4.726 | 5.197 | 5.653 | 6.109 |
| 80 | 1.849 | 2.555 | 3.261 | 3.874 | 4.487 | 4.986 | 5.484 | 5.966 | 6.448 |
| 82 | 1.947 | 2.690 | 3.433 | 4.080 | 4.726 | 5.253 | 5.779 | 6.289 | 6.798 |
| 84 | 2.048 | 2.829 | 3.609 | 4.290 | 4.971 | 5.527 | 6.082 | 6.620 | 7.157 |
| 86 | 2.151 | 2.971 | 3.790 | 4.507 | 5.223 | 5.809 | 6.394 | 6.960 | 7.525 |
| 88 | 2.256 | 3.116 | 3.975 | 4.729 | 5.482 | 6.098 | 6.714 | 7.309 | 7.904 |
| 90 | 2.365 | 3.265 | 4.165 | 4.956 | 5.747 | 6.395 | 7.043 | 7.668 | 8.292 |
| 92 | 2.476 | 3.418 | 4.359 | 5.189 | 6.019 | 6.700 | 7.381 | 8.036 | 8.690 |
| 94 | 2.589 | 3.574 | 4.558 | 5.428 | 6.298 | 7.013 | 7.727 | 8.413 | 9.098 |
| 96 | 2.705 | 3.733 | 4.761 | 5.672 | 6.583 | 7.332 | 8.081 | 8.799 | 9.516 |
| 98 | 2.824 | 3.897 | 4.969 | 5.922 | 6.874 | 7.660 | 8.445 | 9.195 | 9.945 |
| 100 | 2.945 | 4.064 | 5.182 | 6.178 | 7.173 | 7.995 | 8.817 | 9.600 | 10.383 |

# BLM's Standard, Non-Standard, Stand Inventory System

by

Thomas R. Costello

and

H. Gyde Lund

Bureau of Land Management (D-340)
Denver Service Center
Denver Federal Center, Building 50
Denver, Colorado 80225

ABSTRACT:

The BLM is currently developing an information data base through its Strategic Plan to be used throughout the Bureau. Data definitions, coding input and output formats are being standardized.

The 150 million of acres of forested lands that the BLM administers varies from relatively low-valued pinyon-juniper stands of the southwest and spruce types of Alaska to the prime Douglas-fir areas of Western Oregon. Our planning system requires that we provide data for each and every stand regardless of its value.

This paper describes how we are going about meeting the objectives of the Strategic Plan and the requirements of the planning system while taking into account the value of the forest being inventoried. Maximum data collection flexibility is provided while maintaining rigid input formats. Stand data based upon photo interpretation, ocular estimates or detailed tree measurements may be entered into the system through a series of standardized required and optional forms.

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The Bureau of Land Management, through the Strategic Plan, is developing a standard, Bureau-wide, automated information retrieval system. The first phase of the system deals with resource inventory.1/ In this discussion I will deal with the portion of resource inventory concerned with forest stands.

Our planning system requires that data be available on all forest stands, this includes the woodland type. Two types of information are required. The first describes the present condition and the second describes the opportunities for intensive management. These opportunities are projected for a twenty year time period.

The objectives of the inventory are to show the location, quantity and conditions of the planning unit's existing forest products.2/ A partial list of items we are required to record are stocking, regeneration capability, site quality for stand, volume of existing products and potential yield.

1/ Linne, James M., Susan D. Smith, 1976 Strategic Plan for Information Systems Management. Vol I The Framwork (BLM Information Systems Steering Committee).

2/ Bureau of Land Management Manual, 1605.43 Forest Products.

The BLM's forest land varies in value from high value forest land in Oregon, California and Idaho to the Pinyon-Juniper forests of the southwest.

Our challenge is to provide an information collection and retrieval system with flexibility to be usable for all Bureau forest land.

The first priority in the development of a Bureau-wide, automated information system was given to Resource Inventories and Unit Resource Analysis, both with regard to present situation and recommended treatments. As a part of this 1st phase, a Detailed Requirements Definition (DRD) study was made and a data element dictionary was developed. The DRD dictionary presently contains 3032 terms. About 600 are used by forestry.

During this phase all known needed definitions were discussed and examined to eliminate duplication and ambiguity. There are still several near duplications due to different uses of similar terms. These terms may be consolidated in the future.

After providing standard terms and definitions the next step was the development of standard input forms with the flexibility to accommodate the various information needs.

Figure 1 shows a simplified flow chart for forest stand information. All the necessary processing for data manipulation, storage and retrieval have been eliminated so the chart will retain its clarity.

The flow chart is divided into three parts: the first is inventory, the second is data base, and the third is the output. The three parts of the output are: URA three, which describes the present situation, and URA four, which presents the opportunities for management, and the "Ad hoc" outputs are reports prepared as needed for a specific purpose.

The Bureau does not require a uniform level of information to be collected on all forest stands. The quality and quantity of information to be collected is determined during the pre-planning analysis, which is conducted at the district level.3/

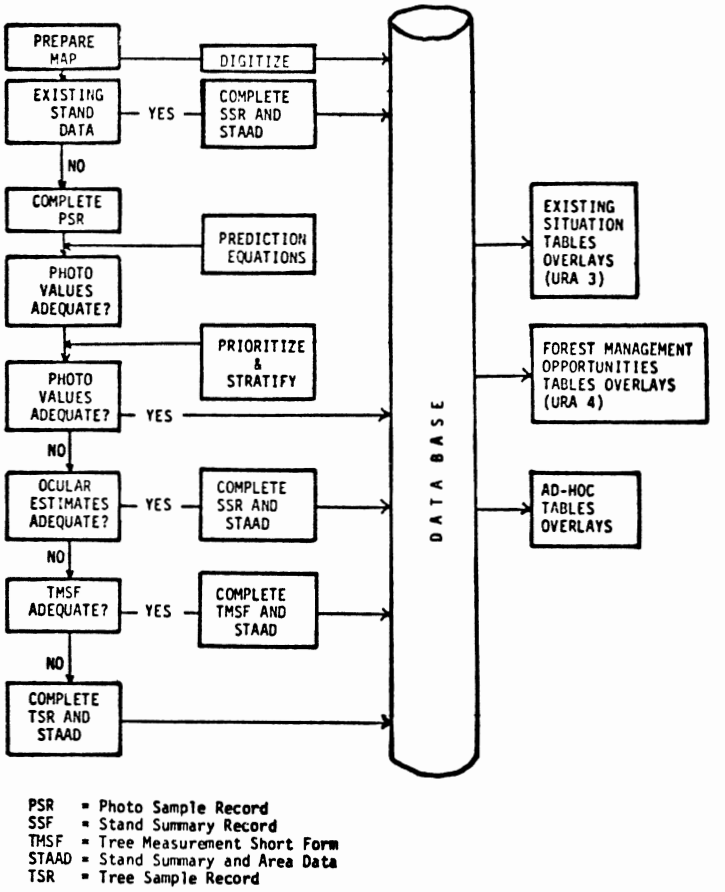
Let's look at the system.

First, base maps are prepared. These maps are presently part of an atlas system. In the future these maps will be digitized into the automated data base.

Our next step is to review all existing information to determine adequacy. If the available forest stand information meets the defined needs, the Stand Summary Record (SSR) (DSC 5250-1), and Stand Treatment and Area Data (STAAD) (DSC 5250-2) forms may be used as an entry to the data base.

3/ Bureau of Land Management Manual, 1601.5, Planning System Management.

Figure 1. STAND INVENTORY FLOW




PSR = Photo Sample Record
SSF = Stand Summary Record
TMSF = Tree Measurement Short Form
STAAD = Stand Summary and Area Data
TSR = Tree Sample Record

If the existing data is not adequate, the next step is to complete the "BLM Photo Summary Record" (PSR) (DSC 5250-4) Figure 2.

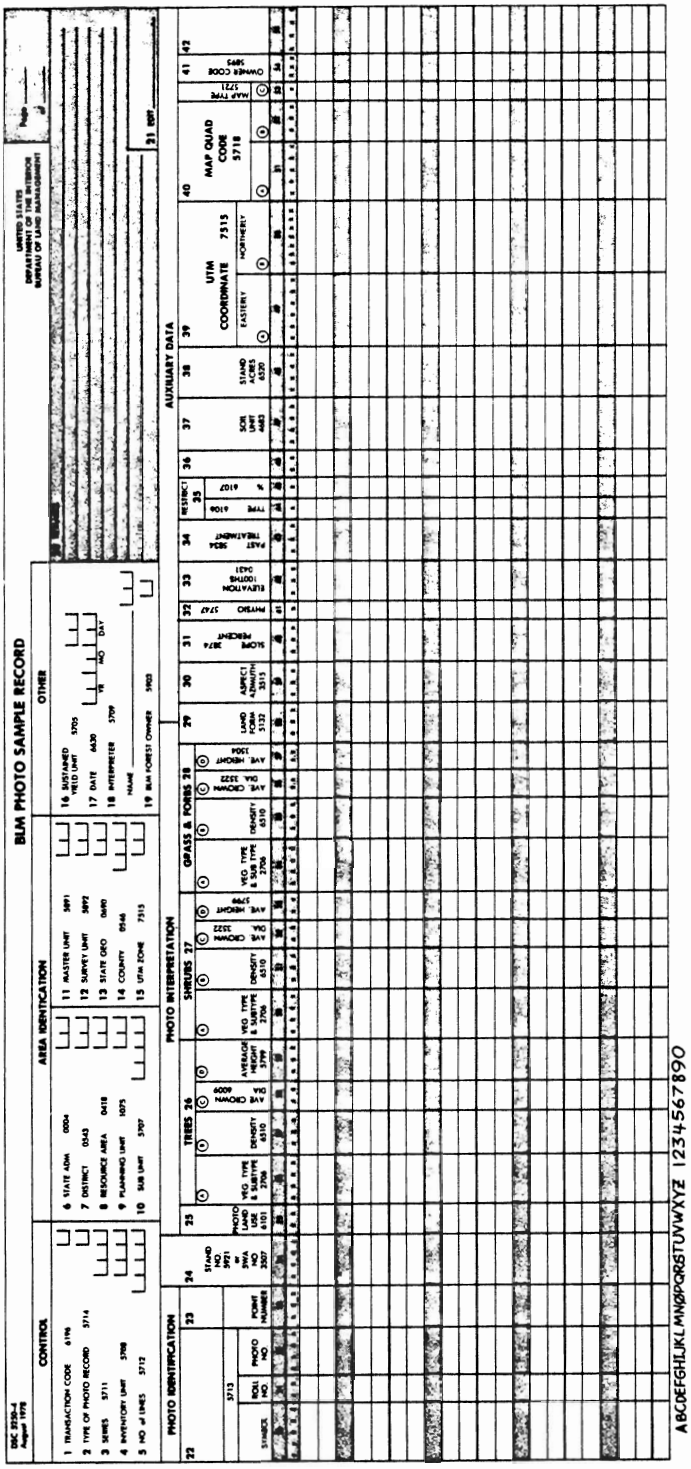
The Photo Summary Record portrays the following information:

The first is control, area identification, photo identification and stand number. The second is vegetation data, vegetation type and subtypes, density (crown closure), average crown diameter and average height. The third is physical site data such as land form, aspect, slope, physiography (position of slope), elevation and universal transverse mercatur (UTM) co-ordinates. This data may be obtained from maps. The photo data then is entered into the data base.

Figure 3 shows an example of the type of photo input and output generated by the prediction equations. A set of these equations has been developed for each of 17 inventory units outside western Oregon.

The photo data is then summarized and evaluated for adequacy. If the data meets the information needs, it becomes part of the data base. The next step (if more information is required) is to stratify the photo data into like units; these stands may then be sampled or a 100% measure as required.

Figure 2. BLM Photo Summary Record*




*The back of the form is a continuation of the front.

Figure 3. STAND SUMMARY (P.S.R.)

| | | |
|---|---|---|
| P.S.R. FORM DIRECT | STAND NUMBER = 1592 | ACREAGE = 085 |
| | FOREST TYPE = DOUGLAS FIR | DENSITY = 051 |
| | CROWN DIAMETER = 22 | AVERAGE HEIGHT = 080 |
| | ELEVATION = 7000 | ETC = |
| COMPUTED FOR ALL STANDS | GROSS CUBIC FEET/ACRE | = 900 (CALCULATED) |
| EXTENSIVE FOREST INVENTORY PREDICTION EQUATIONS | SITE INDEX | = 40 |
| | YIELD CAPABILITY | = 24.3 |
| | STAND AGE | = 180 |
| | AVERAGE STAND DIAMETER | = 14 |
| | BASAL AREA/ACRE | = 56 |
| | TREE/ACRE | = 58 |
| | STOCKING PERCENT | = 112 |
| | GROSS CUBIC FEET/ACRE | = 1207 |
| | GROSS SCRIBNER/ACRE | = 4731 |
| | GROSS INTERNATIONAL/ACRE | = 6196 |

## Field Measurements

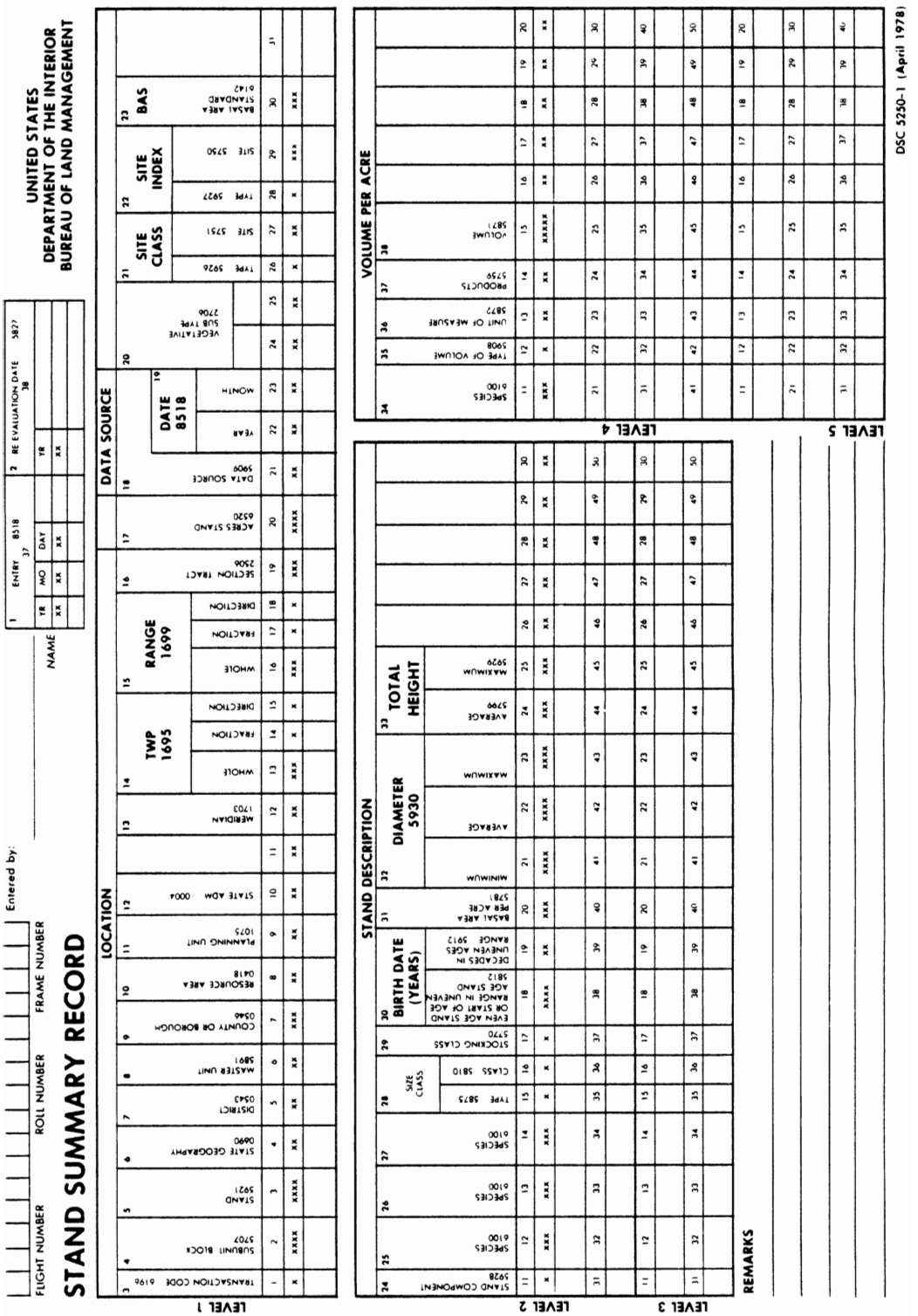
The BLM has three forms to capture ground recorded information. We have a choice of using Ocular estimations, measured or a combination of both.

The first, the Stand Summary Record (DSC 5250-1) (See Figure 4) has a dual function. The first is to provide input for existing data. The second is to record ocular surveyed information.

The first part is used to record date and the location information, following this is the data source and data; vegetative sub-type (Forest type), site class, or site index, and basal area standard.

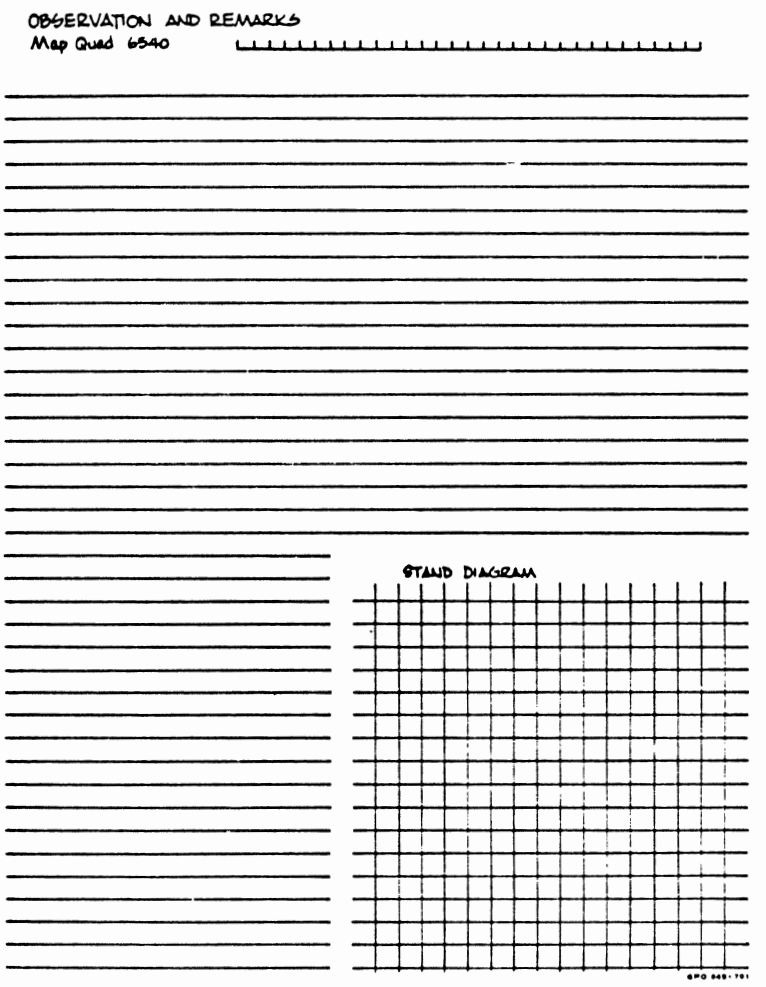
The stand description is the key portion of this form. When the stand consists of one or more age-height stories, species and/or size classes, the stand may be split into one to four components. For example, the primary component is defined as most significant and influential in defining management opportunities. The second component is the second most significant and so on to the fourth. A stand may have as many as four components, or the primary component may include the entire stand. An even or all age stand can be described. The third part of the form is for recording product and volume information.

# Figure 4. Stand Summary Record




See Figure 4A for back of form.

Figure 4A. Back of Stand Summary Record

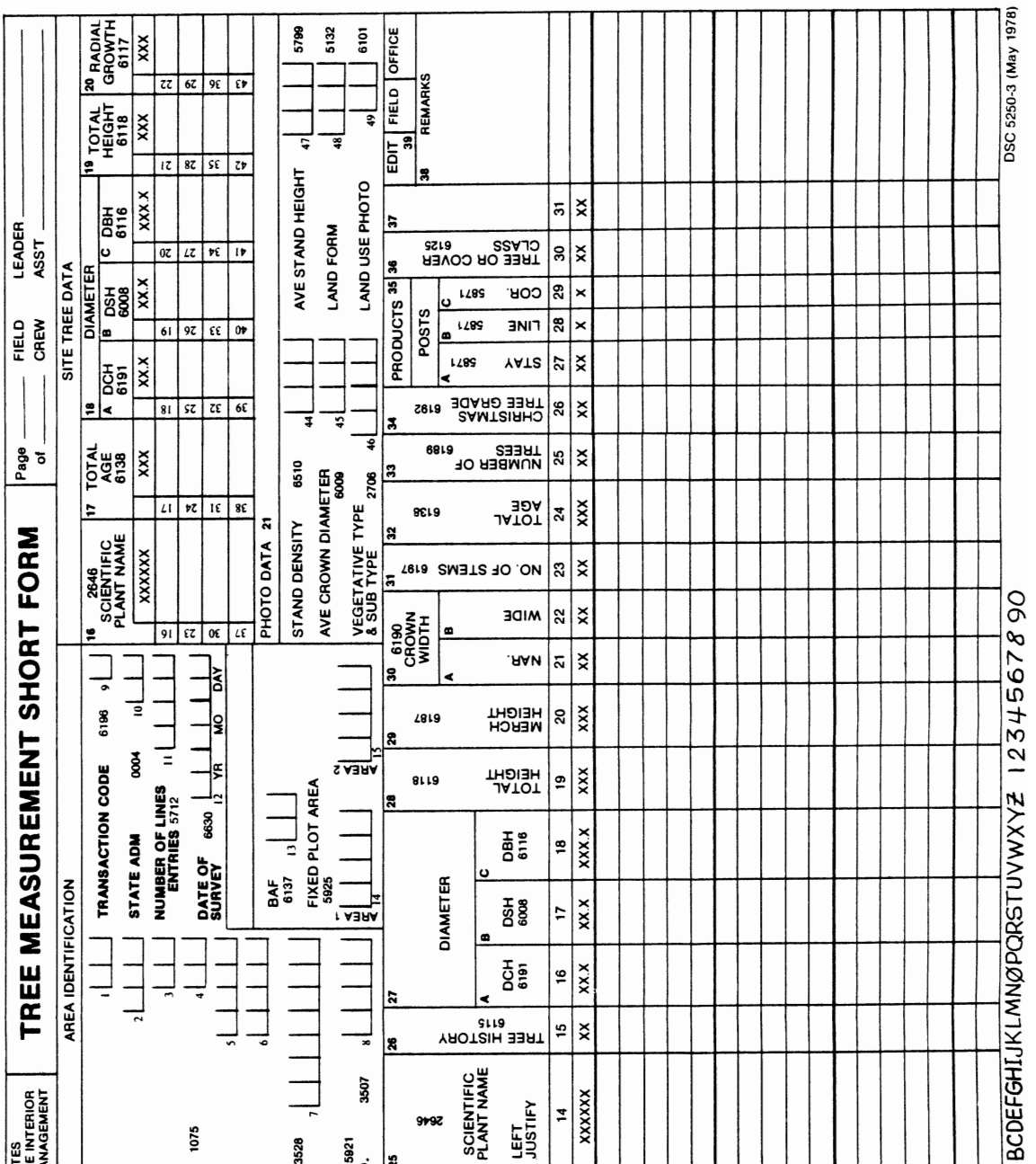



The next two forms are designed to record three measurements from a sample plot. The Tree Measurement Short Form (TMSF) (DSC 5250-3) is designed to record tree measurement about woodland stands (See Figure 5).

The area identification is used to link the ground data to other information in the data base. Our plots may be fixed or variable radius plot. In general 1/10 acre plots are being used in the Pinyon-Juniper woodlands. Site tree data may be recorded along with photo data if it was not recorded on the photo summary record. Next is the tree measurement information. One line is entered for each tree recorded.

Our second tree measurement form is the "BLM Tree Sample Record" (TSR) (DSC 5250-5) (See Figure 6). This form is similar to the "Tree Measurement Short Form". The form is divided into six parts. The first is location information which is similar to our other forms. This form may also be used to remeasure existing forest plots as well as initial data entry. The plot size and type are described in the second section.

Figure 5. Tree Measurement Short Form*




*The back of the form is a continuation of the front.

DSC 5250-5
August 1978

# BLM TREE SAMPLE RECORD

Page _____ of _____

**LOCATION**

1 STATE GEO 0690
2 DISTRICT 0543
3 MASTER UNIT 5891
4 RESOURCE AREA 0418
5 PLANNING UNIT 1075
6 SUB UNIT 5707
7 SAMPLE KIND 5893

8 OLD FOREST STAND OR PLOT NO. 5921 or 6110 | NEW

9 SUSTAINED YIELD OR INVENTORY UNIT NO. 5705 or 5708

10 DATE OF SURVEY 8518
YR MO DAY | YR MO DAY

11A PLOT TYPE 5924
11B BAF 6137
11C FIX PLOT AREA 5925 (AREA 1 / AREA 2)
12 AGE TO B H 6134
13 NO OF RECORDED LINES 5712

14 ROUTE TO R.P. & REMARKS

15 FIELD CREW
LEADER
ASS'T

16 PLOT LOCATION
RP to PLOT Sp. D.B.H. Az Dist.
POINT 1 REFERENCE Sp. D.B.H. Az. Dist.
1.
2
PHOTOS 5713 Scale
Symbol Roll
Photo Nos.
LEGAL DESCRIPTION
T R Sec
Meridian
DECLINATION

POINT LAYOUT
•3 •10 •4 •2 •9 •5 •1 •8 •6 •7

17 EDIT
FIELD | OFFICE

**TREE IDENTIFICATION** | **TREE MEASUREMENT** | **TREE CLASSIFICATION**

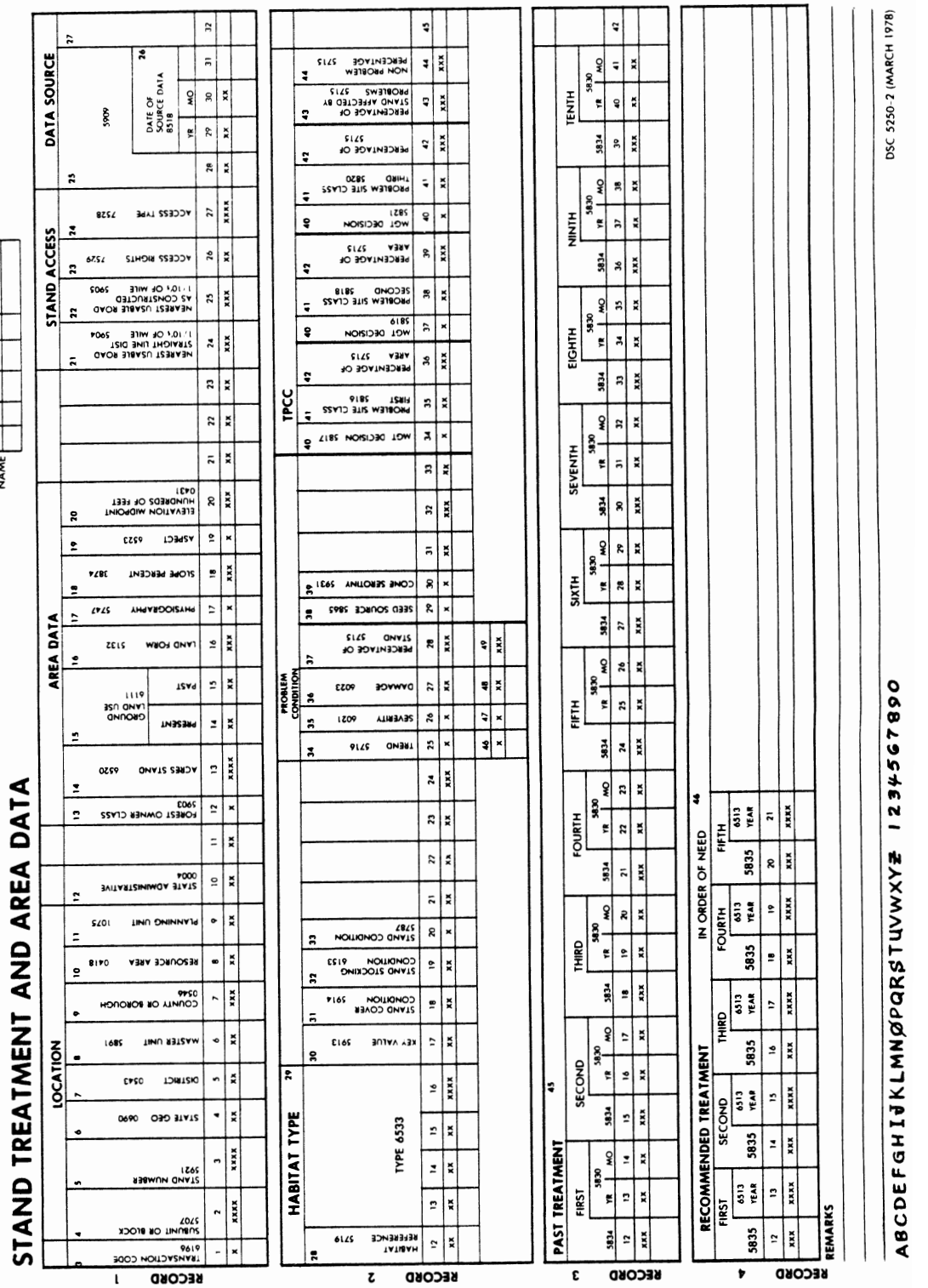
| 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TRANSECT NUMBER 3508 | PLOT OR POINT NO. 3512 6113 | TREE NO. 6114 | AZIMUTH 3515 | DISTANCE 6112 | TREE HISTORY 6115 | SPECIES 6100 | NUMBER OF TREES 6189 | PAST D.B.H. 6116 | PRESENT D.B.H. 6116 | DIA. AT ONE FOOT 6008 | BARK THICKNESS 6135 | 10 YEAR RAD. GRO. 6117 | TREE AGE @ B.H. 6128 | TOTAL HEIGHT 6118 | MERCH. HEIGHT 6187 | | LOG OR TREE GRADE 6120 | SURFACE DEFECT 6121 (LIVE / DEAD) | CROWN RATIO 6122 | CROWN CLASS 6123 | CROWN DIAMETER 6009 | DAMAGE-CAUSE OF DEATH 6124 | SEVERITY 6126 | LOG DEDUCTION CODE: XX LOG POSITION 6129; XX TYPE DEFECT 6130; XX % DEDUCTION 6131 | TREE OR COVER CLASS 6125 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 |
| xxx | xx | xxx | xxx | xx.x | xx | xxx | xx | xxx.x | xxx.x | xxx.x | xxx | xxx | xxx | xxx | xxx | xx | xx | xx | x | x | xx | xx | xx | xxxxxx | xxxxxx | xxxxxx | xxxxxx | xx |

ABCDEFGHIJKLMNØPQRSTUVWXYZ 1234567890

*The back of the form is a continuation of the front.

Figure 6. BLM Tree Sample Record*

Figure 7. Stand Treatments and Area Data*




See Figure 4A for the back of this form. The Stand Summary and Stand Treatment and Area Data record the same data on the back.

The third section is remarks. Its primary use is to make relocation of permanent plots easier.

The next three areas on the form are used to record tree information, one line being recorded for each tree on the plot.

The final input for all stands is recorded on the "Stand Treatment and Area Data" form (DSC 5250-2). (See Figure 7.) This form is used in conjunction with the "Stand Summary Record", "Tree Measurement Short Form" or the "BLM Tree Sample Record". Its prime purpose is to record management recommendations.

The first part of this form, location data, is used to link information in the data base. The area data is used only if the information is not already available in the data base. The access data records access availability and its type.

The following may be recorded on the second line: habitat type, stand condition, problem condition, seed source, cone serontiny and timber production capability classification (TPCC). The TPCC is the most important information on the form since its purpose is to record what forest stands are or are not suitable for sustained yield timber production. Detailed instruction of the TPCC classification system is available in the Oregon BLM Manual supplement entitled "Intensive Inventories - 5250".

A place is provided on the third line for the recordation of previous stand treatments, natural catastrophes, etc.

The fourth line provides a place to record the recommended treatment in order of need.

Summary

The key to the stand inventory and system is a uniform set of definitions and a set of standard forms. The system as described is in the process of development. The Stand Record Forms are being tested in Wyoming, while the Tree Short Form is being tested in Nevada and Utah. The programs to process the stand data are being developed at the Denver Service Center this fiscal year.

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## Current Literature

Please order directly from sources given.

General

"Proceedings of a Workshop on Implementing Computer Systems in the Field" available from Society of American Foresters, 5400 Grosvenor Lane, Washington, D.C. 20014. Price $5.00. 227 pages.

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Reprint: "Specifying Precision in Natural Resource Inventories" by Dave Hamilton from Intermountain Forest & Range Exp. Station, 507 25th St., Ogden, UT 84401.

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Tech. Report 61 - "Maximum Likelihood Estimation for Selected Distributions" by Schreuder et al.

Reprint: "Systematic Approach to Multiple-Use Management" by Biesterfeldt & Boyce.

Reprint: "Choice of Variables for Correlation Analysis When Measurement Error is Present" by Lloyd.

From Southeastern Forest Exp. Station, P.O. Box 2570, Asheville, N.C. 28802.

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FORESTRY

Gen. Tech. Rep. NC-46 contains "Nonlinear Basal Area Growth Models for Red Pine" by Chen and Rose. Contact North Central Forest Exp. Station, 1992 Folwell Avenue, St. Paul, MN 55108 for a copy.

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Extension Circular 956 "Logging Woodland Properties - A Worksheet for Landowners", from Coop. Extension Service, Oregon State University Extension Hall, Corvallis, OR 97331.

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Bull. 1883 "Volume Tables for Young-Growth Conifers in the Northern Regions of California" from Coop. Extension, USDA, University of California, Berkeley, CA 94720.

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Coop. Ext. Pub. 1961 "Tax Savings on Timber Sales" from Louisiana Coop. Extension Service, LSU & A&M College, University Station, Baton Rouge, LA 70803.

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"Comparison of Tree Biomass Estimators - d.b.h. and Sapwood Area" by Snell and Brown.

"Simulation Studies on Line Intersect Sampling of Forest Residue" by Pickfor and Hazard. Both in the January '79 issue of Forest Science - at your conservation library.

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Reprint: "Count Sampling in Forestry" by Schreuder.

"Forest Statistics of the US - 1977 - Review Draft".

Res. Bull. SE 44 "Virginia's Timber, 1977"

Res. Paper - SE-188 "Above Ground Biomass of Slash Pine in a Natural Sawtimber Stand in Southern Alabama".

Misc. Pub. No. 1361 "Atlas of United States Trees - Vol. 5, Florida:

All from: Southeastern Forest Exp. Sta., P.O. Box 2570, Asheville, N.C. 28802.

The California Forestry Handbook is available from the Office of Procurement, Publications Section, P.O. Box 1015, North Highlands, CA 95660. The 233 paged book covers the Tree, Forest and its Management, Wood Products of the Forest, Harvesting Tree Crops, Forest Inventory, Log Scaling, Forest Roads, Forest Protection, Forest-Range Management, Water, Wildlife, and Recreation. Copies are available for $2.50. Money orders or checks should be made to the State of California.

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Report 186 - "Instructions pour l'inventaire de Contrôle par échantillonnage"

OR

"Kontrollstichproben: Aufnahmein struktion" - is available from the Swiss Federal Institute of Forestry Research, CH 8903 Birmensdorf, Switzerland.

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"Predicting Stand Losses from the Gypsy Moth: An Application of Automatic Interaction Detection" by Herrick, Gansner & DeBald.

"Determining Average Skidding Distance on Rough Terrain" by Perkins & Lynn.

Both in the February 79 issue of the Journal of Forestry - at your local conservation library.

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PROTECTION

Gen. Tech. Report INT-43 "Planning and Evaluating Prescribed Fires - A Standard Procedure" from Intermountain Forest Exp. Station, 507 25th St., Ogden, UT 84401.

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Coop. Ext. Pub. 1954 "Insect Scouting and Management in Cotton" from Louisiana Coop. Extension Service, LSU & A&M College, University Station, Baton Rouge, LA 70803.

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Reprint: "Factors For Determining Population Trends in Southern Pine Beetle Spots" by Moore.

Res. Paper SE-187 "Estimating Available Fuel Weight Consumed by Prescribed Fires in the South".

From Southeastern Forest Exp. Sta., P.O. Box 2570, Asheville, N.C. 28802.

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REMOTE SENSING

Bibliography A-35 "Home Range and Urban Imagery in Environmental Planning and Design" from Vance Bibliographies, P.O. Box 229, Monticello, IL 61856. Price $1.50 plus $0.50 handling.

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Tech. Paper 335 "Image Interpreter Screening Performance as Affected by Resolution, Presentation Rate and Scale".

Tech. Paper 347 "Mission/Data-Base Imagery Correlation Techniques".

From US Army Research Inst. for the Behavioral & Social Sciences, 5001 Eisenhower Ave., Alexandria, VA 22333.

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A limited number of copies of "A Selected Bibliography: Remote Sensing Applications for Tropical and Subtropical Vegetation Analysis: are available from Lawrence R. Pettinger, USGS-EROS Data Center, Sioux Falls, SD 57198.

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WATERSHED, SOILS

Neb. Guide, G 78-393 "Water Measurement Calculations" from Coop. Ext. Service, Inst. of Agric. & Natural Resources, University of Nebraska, Lincoln, NE 68583.

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Reprint: "How Much Water in a 12-Ounce Can? - A Perspective on Water-Use Information" by James, Kammerer & Murray.

Reprint: "Monitoring Active Volcanoes" by Tilling

Reprint: "The Future of Earthquake Prediction" by Hamilton - are available from Branch of Distribution, U.S. Geological Survey, 1200 South Eads St., Arlington, VA 22202.

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Bull. 744 - "The Woody Plants of Sphagnous Bogs of Northern New England & Adjacent Canada"

and

Bull. 747 "Soil Potential Rating for Land Use Planning at a Local Level in Maine".

From Life Sciences & Agricultural Exp., Sta., University of Maine, Orono, ME 04473.

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Reprint: "Rust on Iron Rods Indicates Depth of Soil Water Tables" by McKee from Southeastern Forest Exp. Sta., P.O. Box 2570, Asheville, N.C. 28802.

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WILDLIFE & RANGE

"A Fourier Series Estimator of Population Density for Line Transect Sampling" by Crain et al.

Wildlife Monograph No. 62 "Statistical Inference from Capture Data on Closed Animal Populations" by Otis et al.

Both are available from Utah Coop. Wildlife Research Unit, Utah State University, UMC 52, Logan, UT 84322.

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L-19 "Wheat Grading Factors" from Coop. Extension Service, Extension Information, Umberger Hall, Manhattan, KS 66506.

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Reprint: "Principles & Status of Integrated Management From the Range Viewpoint" by Lewis - from Southeastern Forest Exp. Sta., P.O. Box 2570, Asheville, NC 28802.

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## MEETINGS

An intensive short course on Public Involvement is being planned at the University of Idaho May 20-25, 1979. Designed specifically for planners, land managers and planning team members in any government agency, the course will be a practical approach to understanding the legal and moral requirements of involving the public in planning and resource management decisions, and how to operationalize these concepts. The array of public involvement techniques will be examined on the basis of advantages and disadvantages, and participants will learn to select and implement those appropriate to their situations. Registration fee is $245. Contact: Dr. James Fazio or William McLaughlin, College of Forestry, Wildlife and Range Sciences, University of Idaho, Moscow, Idaho 83843 (208-885-7911).

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Satellite Hydrology - will be in the topic for the Fifth Annual William T. Pecora Memorial Symposium to be held June 11-15, 1979, in Souix Falls, S.D. For details contact Donald R. Wiesnet, NOAA/NESS, S-33, Washington, D.C. 20233.

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Workshop on Remote Sensing Field Research - June 25-26 at Purdue University. Scene characterization, spectral data acquisition and calibration, data analysis and instrumentation systems will be covered.

Machine Processing of Remotely Sensed Data - A symposium, June 27-29, 1979 at Purdue University. Emphasis will be on Research Results in:

1. Digital representation and understanding of remotely sensed scenes.
2. Utilization of digitally processed earth resource data.
3. Extraction of information primarily from digital remotely sensed earth resource data.

For information on any of these meetings contact Purdue University, Laboratory for Applications of Remote Sensing, West Lafayette, IN 47907.

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1979 Forest Inventory Workshop. This workshop is designed to appeal to land managers, inventory specialists, practitioners, data analysts and biometricians. This national meeting is sponsored by the SAF Inventory and Biometrics Working Groups, IUFRO Subject Groups Sf.02 and S6.02 and by Colorado State University. Over 84 papers will deal with such subjects as Multi-Resource Inventories, Biometrics, Inventory Projection and Growth, Inventories on Successive Occasions, Sampling Techniques, Sampling Aspects of Aerial Photography, Computer Uses in Resource Inventories, Tropical Inventories, Biomass Measurement, Biomass Inventory, Metric Conversion Strategies, Product Estimation and a series of Contributed papers. Registration fee will be about $75. The dates are July 23-26 1979, at Colorado State University. For details contact Office of Conference and Institutes, Residential Conference Center, Colorado State University, Fort Collins, Colorado 80523.

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