

**AUTHOR GUIDELINES
for the
National Silviculture Workshop
May 21-23, 2019
Bemidji, MN**

To help expedite the publishing process, minimize typographical errors, and avoid inconsistent style, please follow the guidelines below. In addition to peer review, all papers will be reviewed for uniform type and style and converted from author prepared single column format (see attached example) to double column format by the Production staff of the Northern Research Station. Authors are responsible for addressing comments made during the peer-review process for clarity, flow, and brevity before submitting the final draft at the meeting.

MANUSCRIPT ASSEMBLY

Authors of keynote and offered oral presentations are expected to submit a manuscript for peer-review that covers the research they plan to discuss in their presentation. Manuscripts should be assembled in this order:

- | | | |
|---------------------|--------------------------|----------------|
| 1. Abstract | 2. Introduction | 3. Study Areas |
| 4. Methods | 5. Results | 6. Discussion |
| 7. Acknowledgements | 8. Literature Cited | 9. Appendices |
| 10. Tables | 11. Figure Captions, and | 12. Figures |

See the instructions below and attached sample of a final draft for proper formatting of your paper. If you have questions about how to prepare your manuscript, please call John Kabrick at 573-875-5341 Ext. 229 or jkabrick@fs.fed.us. Authors of poster papers are expected to submit either a descriptive extended abstract or research note with an option to submit a manuscript for peer-review with approval of the proceedings editor(s).

GENERAL

Your manuscript should be prepared using Microsoft Word, the preferred format, but we will accept any WordPerfect or RTF file. Please indicate the software package, version used, and your name on the diskette and include a hard copy of all materials submitted. All figures should be in black and white. Both the planning committee and Research Information must approve the use of color figures. Manuscripts should not exceed 10 single-spaced pages including tables and figures. Descriptive extended abstracts should not exceed 400 words. Research notes should not exceed three single-spaced pages and should be prepared without an abstract or headings except for Acknowledgements and Literature cited.

The font for all papers should be set for Bookman 10 pt or Bookman Old Style 10 pt. Type text flush with the left margin leaving the right margin ragged (uneven). Leave 1-inch margins on all four sides. Number the pages (bottom center) consecutively throughout the manuscript. At the end of each line of text, allow the word processor to “wrap around” to the next line. Hard carriage returns should be used only at the ends of paragraphs. Insert one blank line between each paragraph and do not indent paragraphs. Use one space after periods, question marks, semicolons, and colons. Do not manually hyphenate words that end a line and begin a new one. Each table, figure, and reference should be mentioned in the text.

TITLE, AUTHOR NAME(S) and ABSTRACT

Center and boldface the title typed in all capitals. Make it as clear and as brief as possible. Titles exceeding two lines will be revised by proceedings editor.

Leave two blank lines below the title, then center and boldface author name(s). Use one footnote to give working title followed by author's initials in parenthesis, company affiliation, and mailing address for each author. As in the sample manuscript, also give the telephone number and email address for the corresponding author who can answer questions about the paper after it is published. If word processing software does not automatically place footnote at the bottom of the page 1, then draw a 2 inch line approximately 2 inches from bottom of the page and place author information on the next line.

Three blank lines below the author name(s), type ABSTRACT followed by a period and a dash (two hypens) and then text without a space. Limit a manuscript abstract to 100 to 200 words using a 5-inch line of text. Write what is generally called an informative abstract that emphasizes the purpose, results, and conclusions (see attached sample) rather than a descriptive abstract. That is, say "Loblolly pine seeds could not be germinated after they were soaked for more than 16 hours in ethanol at 10° C." rather than "Article describes effects of soaking in ethanol on subsequent germination of loblolly pine seeds." Leave two blank lines before starting the text for the introduction.

HEADINGS

Leave one blank line before first-, second-, and third-level headings and one blank line after. Keep headings to less than 3.2 inches in length. First-level headings for most manuscripts will be study areas, materials and methods, results, discussion, conclusions, acknowledgment, literature cited, and appendices. If included, the heading for introduction will be removed by proceedings editors. Type manuscript headings in the following typographical style:

FIRST-LEVEL HEADING (centered, all caps, bold)

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LISTS

Use Arabic numbers with periods for paragraph enumerations. Sample:

1. Item 1. If the list item is longer than one line indent to line up the second line of text with the first line as shown here.
2. Item 2., and
3. Item 3.

STYLE

Numerals: Express in numerals any number associated with a unit of measurement, time, or money (for example: 7 m, 0.25 inch, 12 percent, 6 hours, 5-day week, 6-year-old, \$3, seven states, five replicates). Numerical values should be expressed with three or fewer significant figures and should not exceed one more than the accuracy of the measurements themselves.

Metric vs. English units: You can use which system you prefer, but do not use or show both. The proceedings will contain an appendix listing conversions for all metric units used within the proceedings.

Diameter at breast height: Express as d.b.h.

Common vs. scientific names: Abstracts and manuscript text should be written preferably with common names. At the first mention for each species within the body of the paper, type genus

species name in italics followed by authorities and set binomials off in parentheses. If many species are mentioned, you may include common and scientific names in a table with other information or add separate list as a table in appendix to avoid cluttering the text. After the first common name, parenthetically add (see Table # or Appendix Table # for list common and scientific names).

Use the word “significant” or “significantly” sparingly, if at all, when describing treatment differences. It is assumed all differences result from analyses described in methods at indicated probability levels.

Percent: Spell out the word “percent” rather than using the symbol “%” in the text including percentages set off in parentheses.

Product identification: When sole-source products and software, including statistical packages, are identified, parenthetically identify the company, city, and state.

States: Follow the U.S. Postal Service style of two-letter abbreviation for States when used with the name of a town. Spell out the State name when standing alone.

The proceedings editors will use the latest edition of the Government Printing Office Style Manual and the Council of Biology Editors Style Manual to resolve other style questions.

LITERATURE CITATIONS

Type each literature citation as if it is a paragraph, allowing the word processor to wrap at the end of each line. None of the lines should be indented. Use two-letter abbreviation for States otherwise do not abbreviate source information. Use only initial and period for first and middle name of all cited authors without a space between them. Hard carriage returns should only be used at the end of each citation. Insert a blank line after each citation.

Literature cited formats can be found in sample manuscript for book or monograph, chapter in a book, series, journal or periodical article, proceedings, article in proceedings, article in proceedings published in journal, an on-line publication, and thesis or dissertation. Do not abbreviate titles of proceedings or journals. For publications in series, the series can be abbreviated, i.e. Gen. Tech. Rep., Res. Pap., Agric. Handbk., Bull. No., etc. If a proceedings article is not part of a widely distributed series, include the date of the meeting (recorded in the sequence of year, month, day), the place of the meeting, and when applicable, the number of the meeting (for example, 12th Central Hardwood Forest Conference). Remember the more information you can give your reader the easier it is for them to find the article.

Use the author-date method to refer to literature in the text. For example, “More rapid runoff may result in increased peak flows (Brown 1980). Later experiments by Miller (1980) showed....” If several references are listed as support for a statement, list the names chronologically: (Endres 1972, 1978, McClure and others 1979, Adams 1980) and separate each with a comma. In text, use the present tense to cite previously established knowledge. For example, “High viscous effects inhibit eddying motion (Roberson and Crow 1990).”

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Reference to unpublished data and personal communications should be avoided whenever possible. If it must be done, do so as a footnote i.e. (data on file with the Department of Forestry, University of Georgia, Athens, GA).

ACKNOWLEDGMENT

Type the acknowledgment, if any, after the last paragraph of your paper, just before the Literature Cited section. Remember to acknowledge external sources of funding that supported this paper by grant number and agency.

TABLES

When used in a sentence, Table is capitalized. When referred to parenthetically, it would be (table 1). Captions should be typed directly above the table. Begin each table caption like this:

Table 1.—*Table should be able to stand alone without the text to describe them with caption in italic.*

Number tables consecutively with Arabic numerals and mention each in the text. Follow number of table with a period, a dash, and then caption in italics. Set width of table at 3.2 or 6.6 inches. Because proceedings papers will be made available on the web, do not prepare tables in “landscape” mode. If using letters to show statistical groupings, leave a space between numerical values and letters.

All columns should have headings; capitalize only the first word and proper nouns. Table footnotes should start with the superscript “1” and should appear below the table as in table in sample manuscript.

FIGURES / PHOTOS

Charts, maps, drawings, and photographs are called “figures,” each should be mentioned in the text. When used in a sentence, Figure 1 is written out; when referred to parenthetically, it would be (fig. 1) or (figs. 1 and 2). Number figures in the order they are mentioned in the text. Follow number of figure with a period, a dash, and then caption in italics. Put figure captions on a separate page after the tables. Avoid putting footnotes in a figure; include the information in the caption. Begin each figure caption like this:

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MULTIRESOURCE INVENTORIES: TECHNIQUES FOR ESTIMATING BIOMASS

Noel N. Cost and Joe P. McClure¹

ABSTRACT.--Multiresource inventory data of Minnesota are used to develop a technique for estimating biomass on a statewide basis. The model describes the kinds and sources of data needed to predict standing aboveground biomass, and provides definitions of area base and biomass components. The results represent the distribution and quantity of biomass on commercial forest, noncommercial forest, and nonforest areas.

Traditionally, State and regional forest inventories have been designed to estimate the volume of wood in trees 5.0 inches and larger, diameter at breast height (DBH), and form a 1-foot stump to a 4.0-inch top diameter outside bark growing on commercial forest land. These merchantability stands are no longer adequate for assessing the resource. Estimates of crown volume are needed for nutrient cycling studies and wildlife habitat evaluations, and to determine site productivity and forest fire hazards (Phillips and Cost 1997).

BIOMASS MODEL

To develop a biomass model, Renewable Resources Evaluation (RRE) expanded the multiresource inventory across all areas in Minnesota and made maximum use of established inventory methods. Thus, RRE could use its existing computer and data management system, maps, aerial photographs, coding systems, and field crews.

BIOMASS DEFINITIONS

As stated in *A Dictionary of Biology*, nomenclature creates a major problem in quantifying biomass on a statewide basis (Abercorbie and others 1964). Notes in some of the more recent research studies highlight the difficulties in exchange of data due to the diverse biomass applications (Beasley 1979, Hitchcock and McDonnell 1979, Vasievich and Hobrla 2001).

Definitions for understory vegetation and tree foliage were taken from a vegetative profile study (Cost 1979, McClure and others 1979). Terms from the two studies blend perfectly so that a complete description of total standing biomass can be obtained.

Forest Land

Commercial Forest Land

Forest land at least 1 acre in size and producing, or capable of producing, crops of industrial wood and not withdrawn from timber utilization.

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Unproductive Forest Land

Forest land is capable of producing 20 cubic feet per acre of industrial wood under natural conditions because of adverse site conditions. Unproductive forest land can be highly productive for wildlife management (Adams 1947, Sampson 1980, Bull 1981).

Total Biomass

The 37.4 million acres of commercial forest, noncommercial forest, and nonforest in Florida support over 2.5 trillion pounds of green biomass. Of the 2.5 trillion pounds of biomass, 74 percent is in wood and bark, 8 percent is in tree foliage, and 18 percent is in other vegetation. The percentage of biomass supported by commercial forest, noncommercial forest, and nonforest uses is shown in Figure 1.

The quantity of biomass in each broad use category is highly dependent upon the acreage within the State as well as the concentration of material on these acres (fig. 1). In interpreting biomass quantities, therefore, it is helpful to know how many acres are in each category.

Species Groups

Table 1 shows the distribution of wood and bark associated with nonforest use, by selected species groups. Eastern white pine (*Pinus strobus* L.) is the leading pine and contains over half of the pine biomass.

Twenty-nine percent of the nonforest area consists of marsh and water, 21 percent improved pasture, 17 percent urban and other, 16 percent cropland, 13 percent rangeland, 3 percent idle farmland, and 1 percent other farmland (table 2).

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LITERATURE CITED

Abercrobie, M.; Hickman, C.J.; Johnson, M.L. 1964. A dictionary of biology. Chicago, IL: Aldine Publishing Co. 798 p. **(Book or monograph)**

Adams, L. 1947. Food habit of cow birds in relation to reforestation. *Journal of Wildlife Management*. 11(3): 281-282. **(Journal or periodical article)**

Beasley, R.S. 1979. Assessment of non-point source from forest practices. In: Research needs and problems in assessing impact of forest management practices on water quality and utility. Tech. Bull. 328. New York, NY: National Council for Air and Stream Improvement: 10-13. **(Chapter in book that is part of a series)**

Bull, E.L. 1981. Indirect estimates of abundance of birds. Estimating numbers of terrestrial birds: Proceedings, international symposium; 1980 October 26-31; Asilomar, CA. In: *Studies in Avian Biology*. Cooper Ornithological Society. 6: 76-80. **(Article in proceedings published in journal)**

Burns, R.M.; Honkala, B.H., tech. coord. 1999. Silvics of North America. Volume 2, Hardwoods. Agric. Handbk. 654. Washington, DC: U.S. Department of Agriculture, Forest Service. Xxx p. **(Book in series with editors)**

Cost, N.D. 1979. Ecological structure of forest vegetation. In: Forest resource inventories; 1979 July 22-27; Fort Collins, CO: 29-37. **(Proceedings article, unidentified publisher)**

Hitchcock, H.C., III; McDonnell, J.P. 1980. Provisional forest biomass statistics for the 201-county Tennessee valley region. Tech. Note B38. Norris, TN: Tennessee Valley Authority. 8 p. **(Series)**

McClure, J.P.; Cost, N.D.; Knight, H.A. 1979. Multiresource inventories—a new concept for forest survey. Res. Pap. SE-191. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Research Station. 68 p. **(Series)**

Phillips, D.R.; Cost, N.D. 1997. Estimating the volume of hardwood crowns, stems, and the total tree. In: Pallardy, S.G.; Cecich, R.A.; Garrett, H.G.; Johnson, P.S., eds. Proceedings, 11th Central Hardwood forest conference; 1997 March 23-26; Columbia, MO. Gen. Tech. Rep. NC-188. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station: 198-215. **(Proceedings with proceedings editors)**

Sampson, D., Jr. 1980. Game bird distribution in upland oak savannas. Columbia, MO: University of Missouri. 88 p. Ph.D. dissertation. **(Thesis or dissertation)**

Vasievich, J.M; Hobrla, S.L. 2001. Great Lakes ecological assessment. [online]. Available: <http://www.ncrs.fs.fed.us/epubs/index.html>. **(On line publication)**

Table 1.—Species, volume, height, diameter and basal area for four study areas in Minnesota.

Study area	Species	Volume	Height	Diameter	Basal area
		<i>Ft</i> ³	<i>Ft</i>	<i>In</i>	<i>Ft</i> ² / <i>ac</i>
Upper slope	Aspen	319	19.5	1.08	39.4
Upper slope	All ¹	--	--	1.04	42.6
Lower slope	Aspen	341	19.5	1.15	42.7
Lower slope	All	--	--	1.11	45.0

¹Includes aspen and all other species found on the site.

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Figure Legends

Figure 1.—Percentage of all forest holdings by size of landowner and forest tract in Minnesota.

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