Fire Ecology Guidelines

(Adapted from Chamberlain, M.J., and Johnson, C. 2007. Journal of Wildlife Management guidelines. The Wildlife Society, Washington, D.C., USA.)

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Revised Spring 2015 by
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Fire Ecology Guidelines

Manuscripts must adhere to Fire Ecology guidelines before they will be approved and sent out for review.

I. SUBMISSION REQUIREMENTS

A. General Format Guidelines:

Article files must be in three parts and submitted in the following order:

1. Cover letter.
2. Text, arranged as follows:
    a. Title page
    b. Manuscript
    c. Literature cited
    d. Figure captions (not figures)
    e. Tables
3. Figures, submitted in individual files.

B. General Guidelines:

1. Submit all text files as Microsoft Word documents.
2. Double-space between all lines of text, including title, authors' addresses, text, long quotations within text, literature citations, table footnotes, table titles, table bodies, and figure titles.
3. Number each line of the manuscript text continuously (i.e., do not restart numbering on each page).
4. Use two regular letter spaces between sentences and within literature cited entries (i.e., between the punctuation of one sentence and the capital letter of the next).
5. Use 0.635 cm (0.25 in) paragraph indentation and use Microsoft Word's paragraph indent function to set indents (do not use tabs to indent paragraphs).
6. Do not break (hyphenate) words on the right margin.
7. Justify the left margin; do not justify the right margin.
8. Use Times New Roman, 12-point font throughout the manuscript, including title and headings.
9. Italicize scientific names, Latin words (including *et al.*), and mathematical symbols that should appear italicized in print.
10. Capitalize all parts of a fire's name (e.g., Howling Fire, Fountain Fire, San Diego Fire).
11. In the body of the text, do not italicize, underline, or bold type for emphasis.
12. Maintain margins of 2.54 cm (1 in) on all sides of the page. Do not leave more than 2.54 cm (1 in) of space at the bottom of a page except to prevent a widow heading.
13. Use first person and active voice throughout the manuscript to avoid superfluous or unclear wording. For example, instead of writing "false absences were estimated," write, "we estimated false absences."

II. ARTICLE FORMAT AND CRITERIA

A. Headings Formats

Four types of headings keep the article organized: running header, and first-, second-, and third-level headings.

1. Running Header
    a. Beginning on the second page of the manuscript, use the Header function to place author name(s) (e.g., Smith, Smith and Jones, Smith *et al.*) in the upper left corner of all pages following the title page.
    b. Follow the authors by a colon and the title of the article, normally shortened. The entire header should run no longer than 45 characters.
    c. Place page numbers in the upper right corner.

2. First-level Heading
    a. Upper-case lettering, bold type, left justified.
    b. Text follows indented 0.635 cm (0.25 in) on the succeeding line.
    c. For example:

    METHODS

    Text begins here.

    d. Under a first-level heading, use only third-level headings if the subsections are short (no more than two paragraphs).
    e. Use first-level headings for appendix titles.

3. Second-level Heading
    a. Italic font, left-justified, title-case.
    b. Text follows indented 0.635 cm (0.25 in) on the succeeding line.
    c. For example:

    Study Area

    Text begins here.

4. Third-level Heading
    a. Indented as for a paragraph, italicized, sentence-case, and followed by a period.
    b. Text follows two regular letter spaces after the period on the same line.
    c. For example:

    Fire regime characteristics. Begin paragraph text here.

    d. Avoid repeating exact wording of the heading in the text following second- and third-level headings.

A. Title Page Format

The title page contains the following information: title, authors and their affiliations, corresponding author contact numbers, abstract, keywords, and citation.

1. Title
    a. Left-justified, bold, sentence case.
    b. The title identifies manuscript content and may not include abbreviations, or acronyms.
    c. Titles should not exceed ten words except to avoid awkward construction.
    d. Do not use scientific names in the title except for organisms that do not have, or have easily confused common names.
    e. Do not use numbers in the title.

2. Authors and Affiliations
    a. Left-justify authors' names.
    b. If there are multiple authors and more than one affiliation, use superscript numerals after each author's name to link authors to their affiliations.
    c. After all of the authors have been listed, list each author's affiliation in sentence-case, beginning with the appropriate superscript number. The affiliation is usually where the author was employed during the study. In each address, use state names, postal codes, and the country (abbreviate "USA," but spell out all others). Include a street address, and write out words like Street, Avenue, and Boulevard, but abbreviate directions (e.g., N and NW).
    d. For multiple authors with the same address, use the same superscript.

3. Corresponding Author
    After the affiliations, list the corresponding author's telephone number using the internationally standardized format of (+)(country code)(area code plus number) (e.g., +1-555-555-5555 for USA numbers), and an e-mail address.
    d. If there are multiple authors, indicate the corresponding author in the author list with a superscript asterisk immediately after the superscript number and not separated by a comma. Begin the corresponding author's information with a superscript asterisk.

4. Abstract
    Begin with the word "**ABSTRACT**" (left-justified) in bold font. The abstract text begins on the next line and is a single paragraph not exceeding 1 line per page of text (3% of length of text), including Literature Cited. The abstract includes:
    a. Problem studied or hypothesis tested. Identify the problem or hypothesis and explain why it is important. Indicate new data, concepts, or interpretations directly or indirectly related to fire ecology.

b. Pertinent methods. State methods used to achieve the results summarized in the Results (keep the methods brief unless a new, greatly improved method is reported).
c. Results. Emphasize the most important results, positive or negative.
d. Utility of results. Explain how, when, where, and by whom data or interpretations can be applied to fire management or contribute to knowledge of fire science.

5. Keywords
    a. Keywords follow the abstract. The phrase "*Keywords*" (left-justified, typed in italic font) is followed by a colon, a regular letter space, and no more than 10 key words in alphabetical order, ending with a period.
    b. Include some words from the title and others that identify:
        i. Common and scientific names of principal organisms in the manuscript.
        ii. The geographic area, usually the country, and state, province or equivalent, or region if its name is well known.
        iii. Phenomena and entities studied (e.g., fire effects, fire regimes, fire adaptations, etc.).
        iv. Methods (only if the manuscript describes a new or improved method).
        v. Other words not covered above but useful for indexing.

6. Citation
    a. After the keywords, the word "*Citation*" (left-justified, in italics) is followed by a colon and a regular space.
    b. See Literature Cited for article citation format.
    c. Example citation for Fire Ecology:
        Citation: Morgan, P., and Z. Holden. 2008. Fire regimes of southwestern forests. Fire Ecology 3(2): 43-62.

C. Major Sections of the Manuscript

Most *Fire Ecology* manuscripts have six major sections: Introduction, Methods, Results, Discussion, Acknowledgements, and Literature Cited. It is not permissible to combine Results and Discussion.

1. Introduction
    a. The introduction starts below the publication name in the Citation on the Title Page and contains a concise synthesis of literature specific to the manuscript's main topic.
    b. In the latter part of this section, state the objectives of the study and the hypotheses tested.

2. Methods
    a. Methods should be brief and include study area, dates, sampling schemes, duration, research or experimental design, and data analyses.

b. Write the Methods in the active voice (i.e., write "We recorded age, size, and species..." and "We analyzed data using logistic regression," rather than "Age, size and species were recorded" or "Logistic regression was used;" see Style and Usage section, below).
c. Use past tense for study area descriptions (e.g., "average annual precipitation was 46 cm," "fuels were primarily grass"). Exceptions include geological formations that have been present for centuries (e.g., mountains).
d. Cite previously published methods without explanation.
e. Identify new or modified methods and explain them in detail.

3. Results
    a. Present Results in a clear, simple, concise, and organized fashion.
    b. Avoid overlapping text with information in tables and figures; do not explain analyses that should have been described in the Methods section.
    c. Always try to describe the magnitude of the biological effect in addition to the results of statistical analyses. That is, terms such as "fewer" or "smaller" tell us little, and stating that something was "statistically different ($P < 0.01$)" without giving the actual difference conveys little meaning to the reader. For example, stating that "A was 25 % larger than B ($P < 0.001$)" conveys more information than simply stating that "A was significantly larger than B."
    d. Present Results in past tense (e.g., wood mass loss occurred during burning).
    e. Reserve comments on interpretation of results for the Discussion.

4. Discussion
    a. The Discussion provides an opportunity for interpreting data and making literature comparisons.
    b. Begin the Discussion by synthesizing your results with regard to your objectives and then relate your work to other literature and research.
    c. Systematic discussion of every aspect of research leads to unnecessarily long manuscripts; be concise and relate your findings directly to your overall project goal, objectives, and hypotheses as appropriate.
    d. Reasonable speculation and new hypotheses to be tested may be included in the Discussion.
    e. Do not repeat results in this section, and comment on only the most important results.
    f. If appropriate, include a paragraph on management implications in the Discussion. Use this paragraph to explain issues important to management and conservation that are derived directly from or addressed in your results. Address specific management opportunities or problems in this section. Do not make recommendations that are beyond the scope of your study.

5. Acknowledgements
    a. The Acknowledgements (note preferred spelling) section appears immediately before Literature Cited.
    b. This section should be brief and include initials (rather than first names) of individuals cited.
    c. Acknowledgements should be straightforward without ornate and qualifying adjectives or personal remarks.

6. Literature Cited
    a. Refer to detailed instructions on how to format specific citations in section V. Literature Cited Formats.
    b. Maintain double-spacing and use 0.635 cm (0.25 in) hanging indents (rather than blank lines) to differentiate between citations.
    c. Spell out all author last names, in title-case lettering, instead of using dashes, in cases of multiple citations of the same author(s).
    d. Present citations within the Literature Cited section in alphabetic order and then chronologic order.

7. Figure Captions and Tables
    a. On a new page following the Literature Cited, compile figure captions (not figures) and tables.
    b. See details for figure captions, table titles, and table format in Tables and Figures, below.

III. STYLE AND USAGE

A. General Comments

Manuscripts with publishable data may be rejected because of poor writing style (e.g., long and complex sentences, superfluous words, unnecessary information, and poor organization). Most editors are patient with this problem and are willing to offer helpful suggestions. However, reviewers may be less tolerant of poor writing, which may result in negative reviews. Many problems can be corrected by having the manuscript critically reviewed by colleagues before submission for publication. Use a direct and concise writing style and minimize repetition among different sections of your manuscript. Avoid using one-sentence paragraphs. Many common problems may be avoided by use of a carefully prepared outline to guide manuscript writing.

B. Elements of Style and Usage

1. Punctuation
    a. Commas
        i. Use a comma after the next-to-last item in a series of more than two items (e.g., red, black, and blue).
        ii. Use a comma after e.g. and i.e.

b. Quotation Marks

i. Write clearly enough so that you do not need to put quotation marks around words or phrases unless they are direct quotations.
ii. Closing quotation marks are always placed after punctuation.
iii. Use quotation marks to imply a special meaning sparingly. Avoid using words in ways other than their standard meanings.

c. Hyphenation

i. Do not hyphenate prefixes, suffixes, or combining forms unless necessary to avoid confusion.
ii. A phrase containing a participle or an adjective is hyphenated as a compound word when it precedes the word modified, and it is written without a hyphen when it follows the word modified (e.g., "a small-fire study" and "a study of small fires" are both correct but have a different meaning than "a small fire study;" "post-fire recovery" and "seeding post fire" are correct usages). However, excessive use of compound modifiers before nouns makes for difficult reading, and tends to obscure the subject. Avoid ambiguous use of nouns as modifiers (e.g., wolf researchers, woman hunters). Use prepositions to avoid using nouns as adverbs (e.g., nesting by birds, not bird nesting; hunting with dogs, not dog hunting), and to avoid noun strings exceeding three words (e.g., GPS locations of fires in fall, not fall fire GPS locations).
iii. A modifier containing a number and a spelled-out name of a unit is usually hyphenated (e.g., a 6-year-old stand). No hyphen is used between a numerical value and a unit symbol (e.g., a 6 yr study).
iv. A two-word modifier containing an adverb ending in "ly" is not hyphenated (e.g., a carefully preserved specimen).

d. Fences

i. Fences must appear in pairs.
ii. Use ([]) in ordinary sentences.
iii. Use {[()]} in mathematical sentences.
iv. Use (()) only in special cases such as chemical names.
v. Brackets are used to enclose something not in the original work being quoted (e.g., insertion into a quotation or a translated title).

e. Slashes

i. Do not use a slash (/) to indicate "and" or "or" or to express a range.
ii. Use the negative exponent (ha^{-1}) to indicate "divided by" or "per."

2. Names

a. Product Names

i. Use trademarks (i.e.,™, ®) at the first mention of a product name, where appropriate, and not thereafter (if introduced in the abstract, re-establish the information in the text).
ii. Provide manufacturer information (manufacturer, city, and state or country of manufacture) immediately following the first use of a product name.
iii. Do not include manufacturer information or location for GIS and GPS.

b. Common and Scientific Names

i. The first time a species is mentioned, use the common name followed by the scientific name. Use the common name thereafter.
ii. If the scientific name is established in the abstract, re-establish it in the text.
iii. If the common name is used in the title, do not follow it with the scientific name.
iv. Use the PLANTS database (http://plants.usda.gov/) as the default authority for plant names for US submissions. For other regions, cite the relevant authority upon first mention of a common or Latin name and place the authority in the literature cited.
v. Do not capitalize common names of species except words that are proper names (e.g., Jeffrey pine, Douglas-fir).
vi. Place scientific names following common names in parentheses and italic font with the first letter of the genus name capitalized and the species name in lower-case letters.
vii. Cite the nomenclature author after the first mention of a scientific name, whether fauna, flora, or bacteria.
viii. Abbreviate genus names with the first letter when they are repeated within a few paragraphs, provided the meaning is clear and cannot be confused with another genus mentioned in the manuscript with the same first letter; e.g., we studied lodgepole pine (*Pinus contorta* Douglas ex Loudon) and whitebark pine (*P. albicaulis* Engelm.).
ix. Do not use subspecies names unless essential.
x. Use “sp.” (singular; not italicized) or “spp.” (plural) to indicate that the identity of species within a genus was unknown; e.g., the field was bordered by willow (*Salix* sp. L.) and we trapped several species of mice (*Peromyscus* spp. Gloger).
xi. Omit scientific names of domesticated animals or cultivated plants unless a plant is endemic or widely escaped from cultivation or is a variety that is not described adequately by its common name.

xii. Community types may be defined as a combination of a dominant overstory species and a dominant understory species, using either common or Latin names: Ponderosa pine/Idaho fescue, or *Pinus ponderosa*/*Festuca idahoensis*. It is permissable to capitalize the first letter of the common name if being used as a community type name.

c. Abbreviations and Acronyms

i. The following abbreviations may be used in the text without definition: metric units, DNA, US, USA, and certain measurement units (see Appendix).
ii. Define all other abbreviations or acronyms the first time you use them in the abstract and text (e.g., Geographic Information System [GIS], Global Positioning System [GPS], Akaike's Information Criterion [AIC]).
iii. Re-establish acronyms in the text that were first established in the abstract.
iv. Do not start sentences with acronyms.
v. Do not use an apostrophe with plural acronyms (e.g., ANOVAs).

3. Enumerating Series of Items
   a. A colon must precede a series of numbered items unless the list is preceded by a verb or preposition.
   b. For presentation of a simple series, place numbers followed by a closing parenthesis only and separate phrases with commas or semicolons.
   c. When enumerating lengthy or complexly punctuated series, place the numbers at the left margin, with periods but no parentheses, and indent run-on lines (see Measurement Units section, below).

4. Numbers
   a. General Rules
      i. Use digits for numbers greater than ten unless the number is the first word of a sentence or is used as a pronoun (e.g., at least one escaped), in which case the number is spelled out.
      ii. Use the NIST Guide for the use of the International System of Units (SI) for all rules related to metric measurements <http://physics.nist.gov/Pubs/SP811/contents.html>.
      iii. Indicate units after each item (e.g., "elevations ranged from 3000 m to 5000 m").
      iv. Use symbols or abbreviations (e.g., % and kg) for measurement units that follow a number unless the number is indefinite (thousands of hectares), is a "0" (zero) or "1" (one) standing alone, or is the first word in a sentence. In such cases, spell out the number and unit name or recast the sentence.

v. Avoid using introductory phrases such as, "A total of ...."
vi. Spell out ordinal numbers (e.g., first, second) in text and Literature Cited, but use digits for cases such as 3-fold and 2-way.
vii. Convert fractions (¼, ⅓, etc.) to decimals except where they misrepresent precision.
viii. Do not use commas to separate digits into groups of three. Separate the digits of numerical values having more than four digits on either side of the decimal marker into groups of three using the thin fixed space (1/4 em space) counting from both the left and right of the decimal marker. (Except for pages in books, clock time, or year dates).
ix. Do not insert a comma or hyphen between consecutive, separate numbers in a phrase (28 3 m^2 plots).
x. Do not use naked decimals (i.e., use 0.05, not .05).
xi. When identifying items by number, use lowercase for names (e.g., plot 1, site 5, day 3).

b. Time, Dates, and Locations

i. Use the 24-hour system: 0001 hours through 2400 hours (midnight).
ii. Date sequence is day month year, without punctuation (e.g., 4 March 2000).
iii. Do not use an apostrophe for plural dates (e.g., 1970s).
iv. Spell out months except in parentheses, citations (symposium dates), table bodies, and figures, in which three-letter abbreviations are used with no period (e.g., 31 Mar 1947).
v. Locations should be identified by latitude and longitude in degrees, minutes, and seconds (e.g., 39° 45' 9" N, 89° 28' 16" W.)

c. Mathematics and Statistics

i. Use italic font for Roman letters used as symbols for quantities (e.g., *n, x, F, t, Z, P,* and *X*; Appendix).
ii. Do not underline or italicize numbers, Greek letters (e.g., chi-square, χ^2), names of trigonometric and transcendental functions, or certain statistical terms (e.g., ln, E, exp, max, min, lim, SD, SE, CV, and df).
iii. Report degrees of freedom used in a statistical test as subscripts to the relevant test statistic.
iv. Insert symbols from your word processing program's symbol directory as opposed to creating the symbol with keyboard functions (e.g., chi-square should appear as χ^2 [found in the symbol directory], as opposed to X^2 [created with keyboard functions]).

v. Use the minus sign from the symbols menu (−) to indicate minus and negative values instead of using the keyboard hyphen.
vi. Use times (×) from the symbol directory to indicate multiplication or dimensions instead of using an asterisk (*) or a lowercase x.
vii. Insert a space on both sides of symbols used as conjunctions (e.g., $P > 0.05$), but close the space when symbols are used as adjectives (e.g., >20 observations).
viii. Where possible, report exact probabilities ($P = 0.057$, not $P > 0.05$).
ix. A subscript precedes a superscript (X_i^3) unless the subscript includes more than three characters.
x. Avoid redundant use of the word "significantly" (e.g., "the means differed [$P = 0.016$]").
xi. Report results of statistical tests or central tendency as in the following examples: ($t_1 = 2.47$, $P = 0.013$), ($F_{3, 12} = 33.10$, $P = 0.01$), ($\chi^2_{10} = 22.1$, $P = 0.029$), or ($\bar{x} = 7.8$, SE = 3.21, $n = 46$). Note that the appropriate degrees of freedom are subscripted with the test statistic.
xii. Present *P*-values less than 0.001 as $P \leq 0.001$.
xiii. Type the names of statistical programs or analytical methods (that are not acronyms) in capital letters (e.g., PROC LIFEREG, POPGEN, Program MARK).
xiv. See instructions on how to cite statistical software packages (page 22, 5[d]).

d. Equations

i. Use the Microsoft Equation Editor 3.0 for all equations.
ii. Break long equations for column-width printing (3.125 inches; 67 mm) if they appear in the main body of the manuscript.
iii. Simple mathematical expressions, such as symbols with simple subscripts or superscripts and Greek letters can be typed as text, using the symbol directory. However, care must be taken to be sure that the font and font size are the same wherever the symbol is used. For example, the Greek letter phi can be represented by both ϕ and φ, which leads to confusion when both appear in the manuscript but are to imply the same symbol.
iv. Mathematical symbols for estimators are typically given "hats" (carets, e.g., $\hat{\mu}$) and require the use of the software, as does proper construction of the symbol for an estimated mean ($\bar{x}$).
v. Submit the following complex equations as display equations in equation boxes:

- Characters that have hats, tildes, or other expressions that would not translate well into straight text.
- Sums, products, and similar statements.
- Brackets around matrices and complex expressions.
- Statistical terms that are not to be italics (e.g., ln, E, exp, max, min, lim, SD, SE, CV, and df) can appear in equation boxes as text without italics by changing the style to "text" while editing the equation box.

e. Measurement Units

i. Use Systeme Internationale d'Unites (SI) units and symbols.
ii. Place a space between numbers and units or symbols (e.g., 10 m, 80 °C , 80 %).
iii. Do not use hyphens between numbers and units unless you are using a number-unit phrase to modify a noun (e.g., correct usage: 12 mm mesh, 3 yr study, 12 mm in diam, and 2 mm wide).
iv. Use English units (or, rarely, another type of scientific unit) in parentheses following a converted metric unit only in cases that may misrepresent: (1) the statistical precision of the original measurement, or (2) the correct interpretation of the results. However, these non-SI units are permitted:
    - Area: hectare (ha) in lieu of 10^4 m^2.
    - Temperature: Celsius (C) in lieu of Kelvin (K).
    - Time: minute (min), hour (h), day (d), month (mo), year (yr), etc., in lieu of seconds (s).
    - Volume: liter (L) in lieu of dm^3.
v. The geographic coordinate system of choice is latitude and longitude: degrees, minutes, and seconds (the latter if appropriate): 39° 45' 9" N, 89° 28' 16" W.

5. Citing Literature in Text

a. Published Documents

i. In most cases, reference citations parenthetically at the end of a sentence; e.g., "Fire intensity was highest in the driest years (Finney 1992)."
ii. Cite published literature by author and year; e.g., Jones (1980), Jones and White (1981).
iii. Use "*et al.*" for publications with more than two authors; e.g., (Jones *et al.* 1982).
iv. Do not separate the author and date by a comma, but use a comma to separate a series of citations.
v. Use chronological order for citations in a series; e.g., (Jones 1980, Hanson 1986).
vi. If citations in a series have more than one reference for the same author(s) in the same year, designate the years alphabetically (in italics) and separate citations with semicolons; e.g., (Jones 1980*a*, *b*; Hanson 1981; White 1985, 1986).

vii. For citations in a series with the same year, use alphabetical order within chronological order; e.g., (Brown 1991, Monda 1991, Rotella 1991, Allen 1995).
viii. Do not give more than five citations in the text to reference a specific issue or scientific finding.
ix. For a quotation or paraphrase, cite author, year, colon, page number(s); e.g., "We used Neyman allocation to minimize variance (Krebs 1989: 216)." Use the same style for a book or other lengthy publication unless the reference is to the entire publication; e.g., Odum (1971: 223).
x. Cite documents that are cataloged in major libraries, including theses and dissertations, as published literature. This includes symposia proceedings and United States Government reports that have been widely distributed. However, cite such references as unpublished if they are not easily available.
xi. Cite all other documents as unpublished data in the text only.

b. Unpublished Sources

i. If references are not easily available or are not widely distributed, cite them in the text only. This includes reports that are not published or widely distributed, manuscripts that have not yet been accepted for publication, and personal communications and observations.
ii. Avoid overusing unpublished information. These citations are not as credible as published literature and will make your text cumbersome.
iii. Cite unpublished references in the text as follows:
    - Personal communications: (J.D. Power, National Park Service, Susanville, California, USA, personal communication).
    - Unpublished report: (J. Brown, California Department of Forestry and Fire Protection, Sacramento, California, USA, unpublished report).
    - Unpublished data (including manuscripts in review): (R. Rankin, Forest Service, Colorado Springs, Colorado, USA, unpublished data).
    - A manuscript accepted for publication is cited as a published manuscript in the text using the anticipated publication year.
iv. Spell out all place names.
v. Always include the affiliation in the first citation, even if citing unpublished data or personal observation of one of the authors, but do not repeat the affiliation in subsequent references (e.g., J.G. Jones, personal communication).

c. Equipment and Statistical Software

i. For field equipment, note the manufacturer name and location parenthetically the first time you mention the equipment in the text (e.g., Interface, Missoula, Montana, USA).
ii. Do not include manufacturer information or location for GIS and GPS.
iii. For statistical software, only include the software in Literature Cited if you are referencing the software manual. Otherwise, simply include manufacturer information (manufacturer, city, and state or country of manufacture) immediately following the first use of the statistical product name. Include website access information in citations if the program is only available online.

IV. TABLES AND FIGURES

A. General Rules:

1. Submit only essential tables and figures.
2. Do not submit tables if the information overlaps with information presented in the text, can be easily printed in the text with less journal space, or presents the same data in another table and a figure.
3. Number tables and figures independently. Do not combine multiple tables or figures on one page.
4. In the text, limit reference of tabular data to highlights of the most important information.
5. Reference tables and figures parenthetically (Table 1, Figure 3) and avoid statements such as, "The results are shown in Tables 1-4."
6. Tables and figures should be able to stand alone (i.e., be self-explanatory) and avoid reference to the text.
7. Define relevant abbreviations and acronyms in each table and figure (except items that appear in the Appendix).
8. Table and figure titles must include the subject of the data studied and when and where (region or state and country) the data were collected.
9. Do not include statistics (e.g., *P*-values) or other statements of results in the titles.
10. In rare cases, titles or footnotes of tables and figures may be cross-referenced to avoid repeating long footnotes or the same data; however, this violates the self-explanatory rule and should be avoided.
11. Include tables at the end of the text (following the Literature Cited).
12. Combine figure captions on a separate page and include them with the manuscript text (following the tables).
13. Submit each figure separately from your text file, using acceptable formats defined in section IV C.

B. Tables

1. General Rules
    a. Tables should be formatted using Microsoft Word.

b. Do not prepare tables for small data sets, those containing many blank spaces, zeros, repetitions of the same number, or those with few or no significant data. Put such data or a summary of them in the text.
c. Capitalize only the first letter for a column heading.
d. Column headings are required for each column. Do not submit tables with unlabeled columns.
e. Use alphabetical superscripts, except for footnotes specifying probability levels.
f. Double-space throughout, including title and footnotes.
g. For data that must be shown in a table, items that provide the most important comparisons usually read vertically, not horizontally.
h. Construct tables for column-width (79 mm; 3.125 in) printing. If the table will not fit in one column width, construct it for page-width printing not wider than 165 mm (6.5 in).
i. Avoid vertical lines in tables.

2. Table Titles
    a. Table titles may vary, but we recommend this sequence:
        i. Name of the characteristic that was measured (e.g., mass, age, density).
        ii. Measurement unit or units in parentheses (e.g., cm, No. ha^{-1}, or %).
        iii. Name of organism or other entity measured (e.g., "of ponderosa pine").
        iv. Location(s) and date(s). Each part of the sequence can include more than one item (e.g., "Diameter and moisture content [%] and total weight [kg m^{-2}] of white oak woody fuels in Ohio and Michigan, USA, in 1975").
    b. Do not include statistics or statements of results (e.g., *P*-values).
    c. Avoid beginning the title with superfluous words (e.g., The…, Summary of…, and Comparisons between…) and words that can be presented parenthetically as symbols or abbreviations (e.g., %).
    d. Symbols such as *n* and % in the title seldom need repetition in table headings.
    e. Do not use abbreviations in table titles, except within parentheses. However, use standard abbreviations and symbols (Appendix) in the table body and in footnotes.

3. Table Column and Row Headings
    a. Label columns to avoid unnecessary print in the data field. For example, instead of "$x \pm$ SE," label x and SE separately so that ± need not be printed. Similarly, label sample size columns "*n*" instead of using numbers in parentheses in the data field.
    b. Keep column- and row-heading words out of the data field.
    c. Type main headings flush left, and indent their subheadings.

d. Only capitalize the first word and proper nouns (e.g., No. of times detected in Nevada).
e. Do not use bold font.

4. Table Data Field
    a. Do not use dashes (often misused to mean no information) or zeros unless the item was measured.
    b. Correctly report the precision of the measurements (0, 0.0, 0.00).
    c. Respect digit significance in all numbers, particularly percentages.
    d. Where the number of significant digits varies among data in a column, show each datum at its precision level (i.e., do not exaggerate precision).
    e. For P values, only use three digits past the decimal, and do not list $P = 0.000$; the correct form is $P \leq 0.001$.
    f. Do not use naked decimal points in the data field (e.g., use 0.057 instead of .057).
    g. Use the 1/4 em space to separate numerical values with more than four digits to the left or right of the decimal marker. Four digits may be separated for uniformity in a table.

5. Table Footnotes
    a. For footnote superscripts, use asterisks for probability levels and lowercase Roman (not italic) letters for other footnotes.
    b. Place letters alphabetically in the following sequence: in the title, then left-to-right, and then down.
    c. Make certain that each footnote character in the title and table matches an explanation in a footnote below the table.
    d. Left-justifying the first line including the superscript, and use a 0.635 cm (0.25 in) hanging indent for run-on lines.
    e. Use footnotes to reduce cluttering the title and table with details.

    Note: The most common errors in tables are single spacing, incomplete titles, naked decimal points, and ambiguous or unnecessary characters in the data field.

C. Figures: Photographs and Line Drawings

Figures comprise two types: photographs and line drawings (graphs, maps, etc.).

1. General Rules
    a. If at all possible, submit single-column-width figures. These will be 79 mm (3.125 inches) wide in print.
    b. Figures that are too complex or detailed to fit in a single column may be submitted as double-column-width figures. These will be 165 mm (6.5 inches) in print.
    c. Ensure that any text in the figure is clearly readable when the figure is printed at its target size. See recent issues of the journal for examples.

d. All text and lines added to figures must be digital and smooth-edged (i.e., anti-aliased). Hand-drawn additions are not acceptable; nor are those with pixelated edges, such as those created in Microsoft Paint.
e. Identify arbitrary symbols by legend within the figure.
f. Only capitalize the first word and proper nouns on axis labels and keys.
g. Lettering within figures follows the same guidelines as manuscript text. However, we are requiring Arial font for figures.
h. Use italic letters only where they are essential to the meaning.
i. Each figure must be submitted as a separate file.
j. Files generated in or extracted from Microsoft PowerPoint presentations are not acceptable.

2. Photographs
    a. Photographs must have sharp focus in the most important parts of the image, have high tonal contrast, and have a reference scale if size is important.
    b. Sets of 2 to 4 related pictures can be handled as one figure if they are mounted together and submitted as one image.
    c. Single-column photographs must be at least 1000 pixels across; double-column photographs must be at least 2000 pixels across.
    d. The preferred file formats for photographs are, in order of preference:
        i. .jpg (Joint Photographic Experts Group)
            - JPEG files should be stored at a high quality with a low compression setting.
            - If text or lines have been added to a photograph, the JPEG format is no longer acceptable.
        ii. .png (Portable Network Graphics)
        iii. .tif (Tagged Image File Format)
        iv. .bmp (Windows Bitmap)
        v. .pdf (Portable Document Format)

3. Line Drawings
    a. We recommend professionally prepared line drawings.
    b. If possible, send graphs and maps as vector graphics files; these can be scaled freely without loss of quality. Acceptable vector formats are, in order of preference:
        i. .xls (Excel Workbook)
        ii. .eps (Encapsulated PostScript)
        iii. .ai (Adobe Illustrator)
        iv. .pdf (Portable Document Format)

c. If vector graphics are not an option, graphs and maps must have the same pixel widths as photographs (at least 1000 pixels for single-column figures, at least 2000 pixels for double-column figures), and should be submitted as one of the following formats, in order of preference:
    i. .png (Portable Network Graphics)
    ii. .tif (Tagged Image File Format)
    iii. .bmp (Windows Bitmap)

d. The JPEG (.jpg) format is not acceptable for line drawings.

4. Figure Captions
    a. Figures are not footnoted.
    b. Captions may be several sentences and include brief suggestions for interpreting the figure content.
    c. Like table titles, figure captions should allow the figure to be self-explanatory, describing the variables displayed and where and when data were collected.
    d. Do not include statistical results in the caption.

V. LITERATURE CITED FORMATS

A. General Rules

1. Spell out all words (i.e., do not use abbreviations) with the following three exceptions:
    a. US (e.g., US Fish and Wildlife Service)
    b. USA
    c. USDA (US Department of Agriculture)
2. Alphabetize by authors' surname(s), regardless of the number of multiple authors for the same publication.
3. Spell out all author last names instead of using dashes.
4. Use title-case letters for all names in Literature Cited, and place a comma between all names, even if there are only two (e.g., Schmidt, B.R., and J. Pellet).
5. Use two initials (where appropriate) with no spaces between initials.
6. Only reverse the name order of the first author (e.g., Thogmartin, W.E., J.R. Sauer, and M.G. Knutson). Do not reverse the name order for the first name of the editor, compiler, etc., within a citation.
7. Use two spaces between all entries.
8. For serial publications, show the issue number only if the pages of each issue are numbered separately.
9. As in the text, spell out ordinal numbers (e.g., Third edition).
10. Do not include words such as Inc. or Company.

11. Use the word Thesis to denote Master of Science (M.S.) or Master of Arts (M.A.), and use the word Dissertation for Doctor of Philosophy (Ph.D.).
12. Do not write the total page number of books at the end of the citation.
13. For foreign language publications, note the language of publication at the end of the citation in brackets (e.g., [In Spanish.]).
14. To document a file available for viewing and downloading via the World Wide Web, provide the following information: author's or organization's name (if known), date of publication or last revision, title of document, title of complete work (if relevant), URL, and date of access.

B. Examples of Specific Formats

1. Books

a. Book: General Format

Carle, D. 2002. Burning questions. Praeger, Westport, Connecticut, USA.

Note: Do not write the total page number of books at the end of citations.

Biswell, H.H. 1989. Prescribed burning in California wildlands vegetation management. University of California Press, Berkeley, USA.

Note: If the state (or province) appears in the publisher or agency name, it need not be repeated after the city.

b. Book: More Than One Edition

Pyne, S.J., P.L. Andrews, and R.D. Laven. 1996. Introduction to wildland fire. Second edition. Wiley, Hoboken, New Jersey, USA.

c. Book: More Than One Publisher

Sowls, L.K. 1955. Prairie ducks: a study of their behavior, ecology, and management. Stackpole, Harrisburg, Pennsylvania, USA, and Wildlife Management Institute, Washington, D.C., USA.

d. Book: More Than One Volume

Abrams, L. 1923. An illustrated flora of the Pacific states. Volume 1. Stanford University Press, California, USA.

e. Book: Editor as Author

Chuvieco, E., editor. 2003. Wildland fire danger estimation and mapping. World Scientific, London, United Kingdom.

f. Book: Reprint

Leopold, A. 1933. Game management. 1946 reprint. Charles Scribner's Sons, New York, New York, USA.

g. Book: Chapter

Fites-Kaufman, J. 2006. Fire and plant interactions. Pages 94-117 in: N.G. Sugihara, J.W. van Wagtendonk, K.E. Shaffer, J. Fites-Kaufman, and A.E. Thode, editors. Fire in California's ecosystems. University of California Press, Berkeley, California, USA.

*Note: Do not put "*in*:" in italics and do not reverse the first author's initials for the book.*

2. Journals

a. Journal: General Format

Edwards, A.C., and J. Russell-Smith. 2009. Ecological thresholds and the status of fire sensitive vegetation in western Arnhem Land, northern Australia: implications for management. International Journal of Wildland Fire 18: 127-146.

Note: Place a space between the colon and the page numbers.

Korb, J.E., J. White, and M. Japhet. 2008. Wildland fire: an opportunistic event for reintroducing a native salmonid. Fire Ecology 4(2): 3-14.

Note: Issue numbers are included only if the pages of each issue are numbered separately.

b. Journal in Press: Year and Volume Known

Donato, D.C., J.L. Campbell, J.B. Fontaine, and B.E. Law. 2009. Quantifying char in postfire woody detritus inventories. Fire Ecology 5: in press.

Note: Do not include articles that have not yet been accepted. Those should be cited in the text as unpublished data.

c. Journal in Press: Year and Volume Unknown

Power, J.D. In press. Chaparral fires in Pinnacles National Park, California, USA. International Journal of Wildland Fire.

d. Multiple Citations of the Same Author(s)

Agee, J.K. 1993. Fire ecology of the Pacific northwest. Island Press, Washington, D.C., USA.

Agee, J.K. 1994. Fire in our future. International Journal of Ecoforestry 10: 184-193.

Agee, J.K., R.H. Wakimoto, and H.H. Biswell. 1978. Fire and fuel dynamics of Sierra Nevada conifers. Forest Ecology and Management 1: 255-265.

Agee, J.K., R.H. Wakimoto, E.F. Darley, and H.H. Biswell. 1973. Eucalyptus fuel dynamics in the Berkeley-Oakland Hills. California Agriculture 27(9): 13-15.

3. Proceedings
    a. *Proceedings: Complete Volume*

        Sugihara, N.G., M. Morales, and T. Morales, editors. 2002. Proceedings of the symposium: fire in California ecosystems: integrating ecology, prevention, and management. Association for Fire Ecology Miscellaneous Publication 1.

    b. *Proceedings: Individual Article*

        Lansing, C. 2002. Fire effects monitoring results from Yosemite National Park's white fir-mixed conifer forest: fuel load and tree density change. Pages 364-371 in: N.G. Sugihara, M. Morales, and T. Morales, editors. Proceedings of the symposium: fire in California ecosystems: integrating ecology, prevention, and management. Association for Fire Ecology Miscellaneous Publication 1.

    c. *Proceedings: Part of a Numbered Series*

        Stephens, S.L., D.A. Gordon, and R.E. Martin. 1994. Combustibility of selected domestic vegetation subjected to desiccation. Proceedings of the 12th Conference on Fire and Forest Meteorology 12: 565-571.

        Stephenson, N.L., D.J. Parsons, and T.W. Swetnam. 1991. Restoring natural fire to the sequoia-mixed conifer forest: should intense fire play a role? Proceedings of the Tall Timbers Fire Ecology Conference 17: 321-337.

    d. *Proceedings: Complete Volume (not part of a numbered series)*

        Mutch, R.E., technical coordinator. 1985. Prescribed fire by aerial ignition—proceedings of a workshop. Intermountain Fire Council, 30 October-1 November 1984, Missoula, Montana, USA.

        Note: Include dates and location with these citations.

    e. *Proceedings: Individual Article (not part of a numbered series)*

        Rothermel, R.C. 1985. Fire behavior considerations of aerial ignition. Pages 143-158 in: R.E. Mutch, technical coordinator. Prescribed fire by aerial ignition—proceedings of a workshop. Intermountain Fire Council, 30 October-1 November 1984, Missoula, Montana, USA.

        Note: Include dates and location with these citations.

4. Reports
    a. *Report: Not part of a Numbered Series*

        Lull, H.W. 1968. A forest atlas of the northeast. USDA Forest Service, Northeast Forest and Experiment Station, Upper Darby, Pennsylvania, USA.

b. Report: Part of a Numbered Series

Lutes, D.C., R.E. Keane, J.F. Caratti, C.H. Key, N.C. Benson, S. Sutherland, and L.J. Gangi. 2006. FIREMON: fire effects monitoring and inventory system. USDA Forest Service General Technical Report RMRS-GTR-164CD, Rocky Mountain Research Station, Fort Collins, Colorado, USA.

c. Report: Agency as Author

Centers for Water and Wildland Resources. 1996. Sierra Nevada Ecosystem Project, final report to Congress. Volume II, assessments and scientific basis for management options. University of California, Davis, Wildland Resources Center Report No. 37.

5. Other

a. Court Cases

Cite complete title and year of case in text only.

b. Foreign Language Publications

Angulo, E. 2003. Factores que afectan a la distribución y abundancia del conejo en Andalucía. Dissertation, Complutense University, Madrid, Spain. [In Spanish.]

c. Newspaper, Newsletter, and Magazines Articles

Associated Press. 1997. Feathers could fly over dove hunting. Columbus Dispatch. 28 December 1997; section E: 15.

Eisler, P., and J.T. Buckley. 1996. Voters to get a shot at hunting laws. USA Today. 25 April 1996; section A: 4.

Hogan, M. 1997. Political season as important as hunting season. Safari Times 9(8): 18.

Jones, D.M. 1997. Protecting animals at the ballot box. Mainstream, Animal Protection Institute. Spring: 24-27.

Jones-Jolma, D. 1993. The fight to reform trapping in Arizona. The Animals' Agenda. March-April: 20-2.

d. Software Package

SAS Institute. 2001. Version 8.02 user manual. SAS Institute, Cary, North Carolina, USA.

Note: For statistical software, only include the software in Literature Cited section (not in text) if you are referencing the software manual.

e. Theses or Dissertations

Huntzinger, Pamela M. 2000. Effects of fire management on butterfly fauna of the forested western United States. Thesis, University of California, Davis, USA.

van Wilgen, B.W. 1984. The derivariation of fire hazard indices and burning prescriptions from climatic and ecological features of the fynbos biome. Dissertation, University of Cape Town, South Africa.

f. Web Citation: Professional Site

Council of Biology Editors [CBE]. 1999. CBE home page. <http://www.council scienceeditors.org>. Accessed 7 October 1999.

g. Web Citation: Government Site

National Oceanic and Atmospheric Administration [NOAA]. 2005 National Weather Service internet services team. Monthly precipitation for Reno, Nevada. <http://www.wrh.noaa.gov/rev/hydrology/monthly_precip.php>. Accessed 23 August 2005.

APPENDIX
REQUIRED ABBREVIATIONS FOR TABLES, FIGURES, AND PARENTHETIC EXPRESSIONS

Abbreviate the following terms in parentheses, tables, and figures, but do not abbreviate these terms in regular text. Do not define terms listed in this table; however, all additional abbreviations must be defined the first time they appear in the text. All metric units must be expressed using the symbols specified in: Thompson, A., and B.N. Taylor. 2008. Guide for the use of the international system of units. National Institute of Standards and Technology Special Publication 811. <http://physics.nist.gov/Pubs/SP811/contents.html>.

Term	Abbreviation or symbol	Term	Abbreviation or symbol
Amount	amt	Minute	min
Approximately	approx.	Month	mo
Chi-square	χ^2	Month names	Jan, Feb, etc.
Coefficient	coeff.	Greater than	>
Confidence interval	CI, $a \leq x \leq a$	Multiple	R
Confidence limits	CL, $x \pm a$	Number (of items)	no.
Correlation, simple	r	Observed	obs
Determination, multiple	R^2	Percent	%
Determination, simple	r^2	Population size	N
Degrees of freedom	df	Probability	*P*
Diameter	diam	Sample size	*n*
Diameter, breast height	dbh	Sample mean (of x)	$\bar{x}$
Directions	N, S, E, W, NE, NW, etc.	Second	sec
Equation(s)	eq(s)	Spearman rank correlation	rs
Expected	E	Standard deviation(s)	SD
F ratio	*F*	Standard error(s)	SE
Gravity	g	Student's t	*t*
Height	ht	Temperature	temp
Hotelling's T2	T^2	Variation	CV
Hour(s)	h	Versus	vs.
Less than	<	Volume: liquid, book	vol, Vol.
Limit	lim	Weight	wt
Logarithm, base e	ln or loge	Wilcoxon test	T
Logarithm, base 10	log10	Year(s)	yr
Maximum	max.	Z-statistic	*Z*
Minimum	min.		