

Journal of Fish and Wildlife Management
and *North American Fauna* Guide for Authors*

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Manuscript Categories



Journal of Fish and Wildlife Management (JFWM) accepts submission of original, high quality, English-language scientific papers on the practical application and integration of science to conservation and management of native North American fish, wildlife, plants and their habitats. Papers focused outside North America may still be considered if they highlight species that are closely related to, or conservation issues that are germane to, those in North America. The following categories are accepted:

Articles are full research articles of particular topics that contain critical assessments and often innovative interpretation and distillation of principles and generalities; they may include manuscripts focused on methodology and protocol.

Notes cover topics similar to *Articles* but are of more limited scope and inference, typically contain more limited analyses; they are often more descriptive and contain less spatial or temporal replication.

Surveys report on results from a variety of different types of biological surveys and inventory and monitoring studies may include survey methodology manuscripts.

Issues and Perspectives contain reviews and essays examining issues of concern on matters of scientific interest to conservation professionals, as well as critiques and comments on papers published in JFWM, along with invited responses from the original authors that rebut them. Manuscripts in this category, even when they are opinion pieces, should be scientifically based, logical, persuasive and clearly presented.

Editorials, Invited Papers and *Errata* are also published. Contact the Editor-In-Chief with suggested topics or special section requests.



North American Fauna (NAF) accepts submission of original, high quality, English-language scientific manuscripts on an array of topics relating to North American vertebrates, invertebrates and plants in the *Monographs* category only. Appropriate treatments include descriptions of groups of taxa, ecosystems, or complex interactions among species and basic research on species life history, distribution, population dynamics and taxonomy and must be of sufficient detail to be considered an authoritative publication on the topic or species covered. Submissions must be sufficiently complex and multifaceted to justify their length. Justification must be based on characteristics of the research, analyses, and results—not simply the size of the data set or length of the study.

[Online Submission](#)

Please submit new and revised manuscripts and associated correspondence for both *Journal of Fish and Wildlife Management* and *North American Fauna* at the online manuscript submission and peer review site [here](#).

On your first visit to the journal site, you will need to register for an account. The same account is used for both the *Journal of Fish and Wildlife Management* and *North American Fauna*.

To submit a manuscript you will need the following information:

- All author Names, Phone Numbers, Postal and Email Addresses.
- Data Access information (see next section below).
- Manuscript file with continuous line numbering in Word (doc), Ascii Text (txt) or Rich Text (rtf) formats.
- Figures in JPEG (jpg), Tiff (tif), Adobe PDF (pdf), Excel (xls - one sheet only), Word (doc) or PowerPoint (ppt) formats and should be clearly labeled with an appropriate number. Captions should be provided for each in a separate Figure Captions section.
- Tables in Excel (xls - one sheet only) or Word (doc) formats and should be clearly labeled with an appropriate number. Captions should be provided for each with the Table or in a separate Table Captions section.

- Supplemental Material files in any of the above formats or Video files in MPEG (mpg), AVI (avi), Quick Time (mov), Real Video (rv), AU (au), MP3 (mp3), WAV (wav), or Real Audio (ram) formats. Captions should be provided for each file in a Supplemental Material section between the Discussion and Acknowledgements in the manuscript file.
- Please do not use Appendices - use Supplemental Material files instead.
- Detailed captions are required for Tables, Figures and Supplemental Material files following these guidelines:

Each caption should be clearly numbered and have a brief statement of one or two sentences that briefly describes the overall study. Captions should “stand alone” without requiring the reader to refer to other parts of the manuscript and provide the basic “what”, “where” and “when” information for the study. Full common and scientific names should be given at first use in *each* caption. Please define all terms, symbols, abbreviations, etc. in *each* caption.

Maps should contain a compass direction indicator (e.g., north arrow) and a scale bar or labeled latitude and longitude lines when they do not detract from the message of the figure. Provide inset maps to provide geographic context at a readily recognizable scale. Label maps down to at least the state or province level using the full name unless recognized abbreviations are necessary for cluttered figures. Include full disclosure whenever digital images have been electronically manipulated or enhanced.

- Contact information (first and last names, email addresses) for at least three suggested peer reviewers for your manuscript.
- Response to Reviewers document for *revised* manuscripts only. Please provide a point-by-point response addressing the concerns raised by reviewers and editors. A simple Word document with each review comment followed by your response with details for how you addressed or rebutted them is preferred (avoid highlighting, various font sizes and colors, etc.). This provides a simple way for reviewers and editors to efficiently assess your revision. Please always include numbers from the original AND revised manuscripts.
- Cover Letters are not required but can be uploaded if there is important information to provide the editors and reviewers beyond what is captured in the submission process.
- A picture can be worth a thousand words. Figures consisting of high quality photos of the species of study are encouraged, especially interesting, cryptic, unusual, or lesser-known species (e.g., [Figure 1 in Halstead et al. 2011](#)). We also encourage photos of lesser known habitat types (e.g., [Figure 1 in Lynch et al. 2011](#)), difficult to describe apparatuses (e.g., [Figure 2 in Kremetz et al. 2011](#)) or any other interesting and informative subject that better informs and engages

the reader. Photos are published at no costs to authors. In some cases, we may request your permission to use your photograph for the cover image in your Issue.

- Please complete all agency review before submission. We will allow disclaimers on initial submissions only [e.g., "This draft manuscript is distributed solely for purposes of scientific peer review. Its content is deliberative and predecisional, so it must not be disclosed or released by reviewers. Because the manuscript has not yet been approved for publication by the U.S. Geological Survey (USGS), it does not represent any official USGS finding or policy."]. If manuscripts progress to the revision stage, without exception, such disclaimers need to be removed from revised submissions or they will not be processed. Please understand we reserve the right to reject or rescind acceptance of any manuscript when substantive changes (sometimes just a few words) are made that are not based on the journal peer review process.
- File formats evolved quickly; if in doubt or if you do not see the file type you would like to submit, please contact the Editor-In-Chief.

[Data Archiving](#)

In 2011 we implemented a data archiving policy that applies to all papers published in JFWM. The policy has also been implemented by NAF. The policy was formally introduced for JFWM in the editorial for Issue 2, Number 1 published in June 2011, but now applies to NAF as well. See our 2011 [JFWM Editorial](#) for more details, which reads, in part:

The Journal of Fish and Wildlife Management requires, as a condition for publication, that data supporting the results in papers published be provided either directly in the paper, in the associated supplemental materials (electronic files that provide information associated with a paper; Internet links to these files are given in the published paper), or archived in an appropriate public archive. Data are important products of the scientific enterprise, and they should be preserved and usable for decades in the future. Exceptions, especially for sensitive information such as human subject data or the location of endangered species, and short-term embargoes, may be granted at the discretion of the Editor-In-Chief.

In order to comply with our policy, manuscripts submitted to JFWM and NAF require completion of a Data Access field during the submission process that confirms all the raw data required to replicate their results are included using one or more of the following methods:

- (1) directly in the manuscript;

(2) in supplemental material files uploaded with the submission along with captions in a Supplemental Material section of the manuscript itself;

(3) previously exempted from this requirement by the Editor-In-Chief (exemptions are rare and typically cover narrowly defined subsets of data, such as specific locations for species of conservation concern or personal information from survey respondents).

If your manuscript is accepted for publication, the raw data may ultimately reside in appropriate publicly available archives (e.g., DRYAD or ScienceBase) with file captions published in an Archived Material instead of Supplemental Material section. However, even if you plan to use that approach, the data and captions need to be provided in a Supplemental Material section for the purposes of peer review. Once approved, authors can work with the Editor-In-Chief to determine if they will remain as Supplemental Material, be published as Archived Material, or a combination thereof.

It is not acceptable to state that data "will be provided upon acceptance" - these manuscripts will be returned without review. You will be asked to provide details on the raw data used in your study AND specifically how they are being provided for review. Please be specific; complicated data sets may require extensive text. Please provide enough detail so a reader with no previous knowledge of your study can grasp the nature of all the raw data used and quickly confirm that they have been provided as required above. Please provide details for any raw data exemptions PREVIOUSLY granted by the Editor-In-Chief.

[Style Guides and Reference Literature](#)

- Several style manuals provide useful guidance for the preparation of manuscripts, especially the latest edition of *Scientific Style and Format, 8th edition* (Council of Science Editors, Chicago). The *Elements of Style* by Strunk and White (Macmillan, New York) continues to be an excellent guide to English usage. Accuracy and precision in scientific writing are just as important as accuracy and precision in scientific measurement. Lapses in either context invite criticism.
- Our standard for word definition and spelling is *Webster's Third New International Dictionary*, as updated by the latest edition (currently 11th) of *Merriam Webster's Collegiate Dictionary*.
- For taxonomic and vernacular names of North American fish species, we follow the American Fisheries Society's most recent edition of *Common and Scientific Names of Fishes from the United States, Canada, and Mexico* (Special Publication 29). The American Fisheries Society [Fish Name Spellchecker](#) is a useful tool for providing current common and scientific names. For other fish and

invertebrate species, we encourage readers to follow the Society's companion publications: *World Fishes Important to North Americans* (Special Publication 21), and *Common and Scientific Names of Aquatic Invertebrates from the United States and Canada* (*Mollusks*, 2nd edition; *Crustaceans*, and *Cnidaria* and *Ctenophora* are currently available in the latter series).

- For analyses of fish population dynamics, we prefer the notation as used by W. E. Ricker in his *Computation and Interpretation of Biological Statistics of Fish Populations* (Fisheries Research Board of Canada Bulletin 191, 1975). However, all such symbolism should be defined anew in each manuscript.
- Our standards for chemical names are the current editions of the *Merck Index* (Merck & Co., Rahway, New Jersey) and *Enzyme Nomenclature* (Academic Press, San Diego, California). Geneticists should use the "Gene Nomenclature for Protein-Coding Loci in Fish" by J. B. Shaklee et al. (*Transactions of the American Fisheries Society* 119:2–15, 1990).
- As general references for birds, use the most current edition of The American Ornithologists' Union Check-list (i.e., 1998) and periodic supplements published in *Auk*. For mammals, use either Whitaker (1996) *National Audubon Society Field Guide to North American Mammals* or Wilson and Reeder (2005) *Mammal Species of the World*, 3rd edition. There is no single reference for plants in North America; cite the most widely accepted regional flora reference (e.g., in northwestern states, Hitchcock and Cronquist [1973]).
- As a general reference for amphibians and reptiles, follow Crother (2008; Herpetological Circular 37, Society for the Study of Amphibians and Reptiles) for species from North America.
- As a general reference for insects, use the current Entomological Society of America (ESA) Common Names of Insects and Related Organisms online database (http://www.entsoc.org/Pubs/Common_Names/search.asp) or names approved by the ESA Common Names Committee.
- As a general reference for bacteria, follow the International Committee on Systematics of Prokaryotes (formerly the International Committee on Systematic Bacteriology [ICSB]) (<http://ijs.sgmjournals.org/cgi/reprint/30/1/225>).
- For categories not specifically addressed, follow the International Code of Zoological Nomenclature (ICZN) (<http://www.iczn.org/>) or International Code of Botanical Nomenclature (<http://www.bgbm.org/iapt/nomenclature/code/SaintLouis/0000St.Luistitle.htm>).

[Re-publication and Dual Publication](#)

We use [Crossref Similarity Check](#) plagiarism software to actively engage in preventing scholarly and professional plagiarism and ensure that content of submitted manuscripts is original.

We will consider submissions of previously published documents (or portions thereof) when they are not already part of the formal literature, copyrighted, or readily available - and re-publication would therefore significantly serve scientific interests. The Editor-In-Chief makes final decisions. Previous publications that may be *considered* for re-publication include:

- Agency reports
- Theses or dissertations
- Technical analyses of findings published previously for lay audiences
- Reports required by sponsors not widely distributed
- Papers not abstracted by Biological Abstracts or a similar reference
- Other works that do not result in accession by libraries

If any portion of a manuscript has been published or reported elsewhere (including the above categories), all similarities between information in the manuscript and the previous publications must be detailed and cited during the submission process and in the manuscript itself. We generally subscribe to the standards articulated by Kendall in "[Dual Publication of Scientific Information](#)", *Transactions of the American Fisheries Society* 110:573-574 (1981).

We discourage fragmented reporting of results whenever possible. If publishing a single comprehensive paper is not feasible, we recommend related papers be coordinated, cross-referenced, and submitted together. Similarly, publishing of interim manuscripts is discouraged, but exceptions can be made for *Notes*. For example, interim reporting may be appropriate where timely dissemination of data is needed, cannot be accomplished through alternative means, and the data and analysis in the manuscript form a cohesive and meaningful whole. On the other hand, manuscripts that do not meet these criteria, but instead report on interim results in order to fulfill funding source or work plan requirements are likely not appropriate. The nature of a given project and the data produced will determine which manuscripts lend themselves to interim publication.

Authors with any doubt about the appropriateness of a specific manuscript should contact the journal Editor-in-Chief before submission.

Peer Review

The Editor-In-Chief will enlist an appropriate Associate Editor to coordinate the peer review of each submission. Before a final decision is made, each manuscript typically receives three expert reviews. However, we may return to authors without review any manuscript that is of low technical or rhetorical quality, improperly formatted or simply inappropriate for the outlet. Associate Editors make a summary recommendation to the Editor-In-Chief who makes the final decision on the disposition of the manuscript.

Final decisions by the Editor-In-Chief will fall in one of four categories:

Accept – The editorial staff will likely make some other minor editorial changes, but otherwise the manuscript will be published as submitted.

Revise – The manuscript is not accepted for publication, but we believe the it could be acceptable for publication after revision based on the review comments provided. We cannot guarantee future publication of the manuscript.

Reject but Reconsider – We will not be able to accept the manuscript for publication in its current form. However, we would be willing to review a revised version based on the review comments provided. We cannot guarantee future publication of the manuscript.

Reject – The manuscript is rejected for publication in our journal, but reviews are typically provided with numerous suggestions for improving the manuscript should the authors decide to revise it for submission elsewhere.

Reviewers have the option of anonymity. Reviewers should notify the Associate Editor about any potential conflict of interest before accepting a request for review. Reviewers are expected to treat all manuscripts they review as confidential and not share it without prior consent of the Associate Editor or Editor-In-Chief. Potential conflicts of interest for editors, authors and reviewers will be referred to members of the Editorial Board for consideration as necessary. Submissions from Associate Editors or the Editor-In-Chief or their subordinates will be referred to other unaffiliated Associate Editors or a Guest Editor-In-Chief to ensure the authors are completely removed from the review and decision process.

Because the peer review process depends on volunteers, the time required can vary significantly. However, we strive to get final decisions back to authors within 45 days of submission (60 days for lengthy manuscripts and *Monographs*).

Authors seeking rapid review and publication of their manuscript should consider that almost without fail, the cleaner the manuscript, the quicker the review at all levels. In addition, authors should do their part by revising papers promptly. Papers that have been out for revision more than 60 days (90 days for *Monographs*) will be considered withdrawn; revisions completed after that time will be considered new submissions

unless an exception is made by the Editor-In-Chief. Reviewers (and Editors) react positively to concisely written and well-organized papers and are likely to give such papers priority attention. Careless preparation of manuscripts implies careless research and thought and may lead to negative critiques and much longer review times.

Authors can greatly enhance Reviewer and Editor perception of their manuscripts if they:

- Write direct, unambiguous, grammatically correct prose and avoid redundancy and wordiness.
- Clearly establish the intellectual context and practical or theoretical importance of their work.
- Provide all methodological information needed to understand and interpret their results, without unnecessary details.
- Prevent statistical or analytical sophistication from upstaging biological insight.
- Integrate their results broadly but relevantly with the published literature.
- Forgo trivia and unwarranted speculation.
- Avoid hyperbolic terms like critical and unique, when terms like important and unusual will suffice.
- Avoid the use of normative terms like "should", "must" and "need to", which are often inflammatory and usually unnecessary. In nearly all cases, the same point can be made without them through some creative rephrasing.
- Define uncommon terms at least parenthetically at first use and be consistent with use of terminology, abbreviations, acronyms, etc.
- Take pains to avoid a colloquial writing. Similarly, slang and jargon should be aggressively avoided; consider our broad audience and do not assume detailed knowledge of your field or subject on the part of the reader.

A common example is the use of the terms like "threatened", "endangered" and "listed" (e.g., "the blue-nosed otter was listed in 2010" or "the endangered the three-toed piglet was de-listed in 2012"). Those terms are jargon or slang without being clearly tied to specific legislation. Sometimes more generic terms like "a species of conservation concern" are sufficient and are less likely to be conflated with the legal terms and definitions. If legal terms are important (they often are), please clearly tie them to specific legislation and provide citations for the legislation and the actual documents announcing the decision to classify them as threatened, endangered, etc. For example:

Populations of both *Scaphirhynchus* species declined throughout the 20th century resulting in the larger, less common Pallid Sturgeon being federally listed

as endangered (USFWS 1990) pursuant to the U.S. Endangered Species Act (ESA 1973, as amended).

- Keep in mind that these are applied journals and take care to couch their work in a conservation and management context throughout the manuscript. Why it is important for, and how can it be applied to, conservation and management? Being explicit on this front will inform the reader and please the reviewer.
- Follow the instructions in this Guide for Authors. Authors for whom English is not their primary language are strongly encouraged to seek help from someone for whom it is when they prepare their papers for submission.
- Seek friendly but rigorous peer review prior to submission.

[Authorship Guidelines](#)

Fair and ethical recognition of authors is an important consideration. We have adopted the Authorship Guidelines developed by the American Fisheries Society and approved by the American Fisheries Society Governing Board, August 19, 2000. In general, the authorship list should reflect only those persons making a significant contribution to the work, including: determining or developing study objectives; designing experimental or analytical approaches; collecting, analyzing and interpreting data; preparing the paper and responding to peer review criticisms. All authors are responsible for the intellectual content of the paper and are obliged to provide retractions or corrections as appropriate. Refer to the [AFS Authorship Guidelines](#) for a detailed description including standards of authorship, ordering of names on multi-authored papers and what does not constitute authorship.

[Principles of Integrity](#)

We are committed to upholding the highest scientific integrity and have adopted the Committee on Publication Ethics (COPE) guidelines for [Code of Conduct and Principles of Integrity](#). We adhere to the COPE Code of Conduct and Best Practice Guidelines for Journal Editors and Code of Conduct for Journal Publishers and will consult and follow COPE flowcharts, including:

- How to respond to whistle blowers
- Changes in Authorship
- Conflict of Interest
- What to do if you suspect an ethical problem

- What to do if you suspect fabricated data
- What to do if you suspect a reviewer has appropriated an author's idea or data
- What do to if you suspect plagiarism
- What to do if you suspect redundant (duplicate) publication

[Author Complaints](#)

Authors can submit complaints about any aspect of the peer review process directly to the journal Editor-In-Chief. Complaints and appeals will be considered by the Editor-In-Chief in consultation with other Editors. The Editor-In-Chief will make a good faith effort to respond quickly to any complaints or appeals. All reasonable requests will be carefully considered and as a general rule the Editors will give the authors the benefit of the doubt when assessing the merit of complaints and appeals. In cases where unusually difficult concerns or sensitive issues are raised, impartial advice from unaffiliated outside sources will be solicited. The JFWM is a member (NAF is applying for membership) of the [Committee on Publication Ethics](#) (COPE) where unresolved matters will be referred. Complainants are encouraged to consult COPE Guidelines and refer issues to COPE for further resolution if dissatisfied.

[Policy Review](#)

During the online submission process, the submitting author is required to confirm that all contributing authors have read, understand, and are in compliance with the Service guidance provided in the Service Manual Part 117, Chapter 1: "Policy Review Guidance for Scientific Publications". Briefly, the chapter states that there is no Service "policy review" for scientific publications. Accordingly, all articles published in the *Journal of Fish and Wildlife Management* and *North American Fauna* will automatically contain the following disclaimer: "The findings and conclusions in this article are those of the author(s) and do not necessarily represent the views of the U.S. Fish and Wildlife Service."

Let us be very clear - this policy does NOT question or diminish the quality of the work published here, by Service scientists or others, nor does it in any way limit its applicability for use in decision or policy making by the Service or others. Its purpose is simple – to meet standards for scientific freedom by getting our employees out from underneath any ill-defined, cumbersome, and potentially stifling processes of "policy review" and any associated portent of agency censorship, perceived or otherwise. Under this policy, peer-reviewed publications authored by Service employees will stand on their scientific merit, and will be considered equally along with similar scientific publications during Service decision- and policy-making processes. While the *Journal of*

Fish and Wildlife Management and *North American Fauna* are supported by the Service, and information presented in the papers published in them may very well be used in forming official Service decisions and policies, they are not themselves official Service publications and do not *necessarily* represent the official views or imprimatur of the Service.

Former Service Director Dan Ashe described the policy by saying: “This is an empowering permission and encouragement for employees to publish their scientific work, with official attribution, but without the uncertain and potentially unnerving glare of ‘policy review’. It is a hearty vote of confidence in the responsibility and professionalism of Service employees.”

As always, documents that require the imprimatur of the Service (e.g., many documents pursuant to the US Endangered Species Act, other regulatory and decision documents, Service Manual chapters) undergo specific review for both scientific quality and policy, defined elsewhere, and will be published as official Service publications, through outlets such as the Federal Register.

[Online Publication](#)

Within several business days of final manuscript approval, papers will be published in a rough (i.e., without copyediting or typesetting) [Online Early](#) format. This version will allow authors to cite and disseminate their work very quickly after final approval. At this stage, the paper will already have their unique Digital Object Identifier (DOI) that will be included in the citation. Typically, about two weeks later, a more polished and typeset version (minus page numbers) will replace the rough version under the same DOI. The DOI will never change and will ensure that the most recent version of the paper is always being accessed. Final versions fully formatted with page numbers will then be available when the formal journal Issue is released.

[Publication Fees](#)

There are no charges associated with publication in or access to the *Journal of Fish and Wildlife Management* or *North American Fauna*.

[Copyright and Public Domain](#)

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The information published in the *Journal of Fish and Wildlife Management* and *North American Fauna* is provided on an "AS IS" basis and any warranties, either express or implied, including but not limited to implied warranties of non-infringement, originality, merchantability and fitness for a particular purpose, are disclaimed. In no event shall the U.S. Government be liable for any damages that arise out of or in connection with the access, use or performance of this journal, including infringement actions.

[Abstracting and Indexing Services](#)

As of January 2020, *Journal of Fish and Wildlife Management* is abstracted and indexed by Scopus (Elsevier), Web of Science (Clarivate), Natural Science Collection (ProQuest), Gale/Cengage Learning databases, and EBSCO's Environment Complete. The contents are also available via the U.S. Department of Agriculture's National Agricultural Library (Agricola) as well as many other open access search tools.

As of January 2020, *North American Fauna* is abstracted and indexed by EBSCO's Environment Complete, and Web of Science's BIOSIS Previews, Biological Abstracts, and Zoological Record databases (by Clarivate) as well as many other open access search tools.

[Format Conventions](#)

Whenever authors follow the style and format of the journal for which they write, they earn the appreciation of reviewers, editors, and typesetters and save themselves extra revisionary work.

Headers

Indicate levels of heads as follows:

Number One Head

Bold, centered, cap and lowercase (title capitalization).

Number two head

Bold, flush left, capitalize only first word and proper nouns (sentence capitalization).

Number three head.

Lightface, italic, ends with period; text runs in. Capitalization as for number two heads.

Word Processing

- Use line spacing of at least 1.5 for all material, including title, abstract, footnotes, references, tables, and table and figure legends.
- Enable continuous line numbering.
- Number all pages sequentially, including title page, abstract, tables, and figure legends. Make sure that headers or footers will not be confused with the text.
- Turn off all hyphenation and justification routines.
- Use a standard 12-point font throughout (Times/Times New Roman; Courier/Courier New; Helvetica/Arial). Use boldface type only to indicate first-level (centered) and second-level (left justified) heads and vectors. Use an italic font and not underlining to indicate italics (third-level heads). Use an italic font only for scientific binomials (other Latin words and phrases are not italic), single-letter variables and constants in mathematics and statistics, and for *occasional* emphasis.
- Do not use parentheses for scientific binomials.
- Avoid solid capital letters except for acronyms. Acronyms, abbreviations, numerals, and symbols should never begin a sentence or heading. Do not use abbreviations or acronyms if the term appears fewer than five times in either the abstract or the article body.
- Do not use footnotes in text. Items to appear as footnotes on the first page (e.g., corresponding author information) should appear as plain text following the address section.

- Delete all horizontal and vertical lines from tables except the horizontal lines above and below the column heads and across the bottom of the table. Table footnotes take lowercase, superscript letters in alphabetical order, and the sequence starts anew with each table.

Numbers and Symbols

- Spell out single-digit numbers unless they are used with units of measure or are directly compared with a larger number: four anglers; 5 cm; 8 bluefish and 16 striped bass. Use numerals for decimal fractions and numbers of two or more digits: 0.4 times; 17 tanks; 326 fish, but spell out any number that begins a sentence. Use commas in numbers of 1,000 and greater; use 0 before decimal fractions (0.05).
- Use the 24-hour clock for diel time and spell out “hours”: 1435 hours, not 2:35 p.m. Calendar dates can follow either of two formats: day month year (17 July 1990) or month day, year (July 17, 1990); select one style and use it consistently throughout the paper, including tables and figures.
- Use metric units of measure without exception. Report physical measurements in accordance with the *Système International d’Unités* (SI). When one unit appears in a denominator, use a solidus (6 mg/L); use negative exponents and product dots (26.4 g·m³·h⁻¹) for compound denominators.
- Indicate the national currency involved the first time a monetary value is given (e.g., Can \$6, US \$153).
- Give fish ages in Arabic, not roman, numerals (age 3, not age III) and avoid plus (+) signs in the age notation. A fish is age 0 during its first year of life, which is assumed to end December 31 unless otherwise indicated. Define specialized age notations such as those used for anadromous species.
- Some symbols are not unique (for example, N can mean Newton, nitrogen, normal, or north), so terms should be spelled out if there is any chance of ambiguity. All other symbols must be defined when they are introduced in each paper; for example, “1,000 × gravity (g)” at first use, and “1,000 g” thereafter. Avoid excessive use of abbreviations and acronyms.
- All acronyms and abbreviations should be defined at first use in the text, but should be redefined in tables, figures and their captions.

Style Guidelines

- Avoid paragraphs with fewer than three sentences. They usually indicate poor paragraph structure and always make manuscripts choppy. In nearly all cases, they are best incorporated elsewhere, augmented, restructured or deleted.
- Always place commas after “i.e.,” and “e.g.,”.
- Replace “)(“ with a semicolon.
- Separate multiple inline parenthetical citations with semicolons instead of commas. For example, “Previous studies support our conclusions (Olsen et al. 2012; Evans and Cahill 2019)”.
- Please do not start sentences with acronyms or abbreviations.
- Please avoid separating words with a virgule (e.g., “and/or”).
- Please indent all paragraphs with exception of the first following a new heading or subheading; otherwise, paragraph breaks that happen to fall at page breaks are easily missed.
- We feel two of the most useful passages from Strunk and White are:

Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all his sentences short, or that he avoid all detail and treat his subjects only in outline, but that every word tell.

Clarity, clarity, clarity. When you become hopelessly mired in a sentence, it is best to start fresh; do not try to fight your way through against the terrible odds of syntax. Usually what is wrong is that the construction has become too involved at some point; the sentence needs to be broken apart and replaced by two or more shorter sentences.

- The term "habitat" is frequently misused. General use of "habitat" without appropriate context is uninformative and irrelevant to most studies. Habitat is binary feature - a site or location either provides or does not provide habitat. Therefore, terms such as "suitable habitat" are incorrect or redundant. "Suitable habitat" should never be used in a scientific paper. "Habitat suitability" is acceptable as it indicates habitat quality. However, the term "habitat quality" or "quality habitat" should strictly be used in context of population demography, vital rates, or individual fitness. Habitat is species specific. Use of habitat to describe a vegetation type or land cover (e.g., wetland habitat, forest habitat) is incorrect. "Habitat type" has been used in conjunction with description of vegetation composition or land cover. Habitat can only be identified when in conjunction with a specific species (e.g., scaled quail habitat, western meadowlark habitat).

Furthermore, it is more informative to further define habitat based on how a species uses the space (i.e., habitat use; e.g., nesting habitat, escape habitat, winter habitat). Use of the terms "occupied or unoccupied habitat", "potential habitat", and "available habitat" are acceptable.

Additional guidance is available at:

Hall, L.S., P.R. Krausman, and M.L. Morrison. 1997. The habitat concept and a plea for standard terminology. *Wildlife Society Bulletin* 25:173-182.

Krausman, P.R., and M.L. Morrison. 2016. Another plea for standard terminology. *Journal of Wildlife Management* 80:1143–1144.

Geography

- U.S. (adj); United States (n)
- UK (adj or n)
- Spell out states: Kansas, North Carolina, Maryland; if figures are cluttered, two letter abbreviation maybe used.
- 43°15'09"N, 116°40'18"E (no spaces between numbers)

Nomenclature

- Scientific names follow the first mention of a common name in the abstract, text, and captions, but not in the title. Omit taxonomic authority names, except when they are absolutely required for clarification. Spell out *Genus species* upon first mention; *G. species* thereafter, 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 snow geese *Chen caerulescens* and Ross' geese *C. rossii*.
- After indicating scientific names, use the common names in the article per the references in Useful Literature. Capitalize all portions of the common names of fish species and subspecies, but not those of hybrids and life history variants: Largemouth Bass and Lahontan Cutthroat Trout, but saugeye and steelhead. Always use full common names: "Largemouth Bass," not "Bass,". However, if the name is long or frequently used, and cannot be confused with other species, it is acceptable to use the full name at first mention, then a shortened name thereafter if defined; e.g., "Westslope Cutthroat Trout (hereafter Trout)." Except for fishes, do not capitalize common names of species except words that are proper names; e.g., Cooper's hawk *Accipiter cooperii*.

- If there is no common name (e.g., with some parasites), use the scientific name throughout: *Myxobolus cerebralis*. Likewise, if there is no scientific name (e.g., with some viruses or cell lines), then use the common name or abbreviation throughout: infectious hematopoietic necrosis virus (IHNV), Chinook salmon embryo (CHSE-214) cells.
- 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.
- For taxonomic and systematics papers, you may use the scientific names in the titles and throughout.
- Avoid using subspecies names unless essential. Use “sp.” (singular; not italicized) or “spp.” (plural) to indicate that the identity of species within a genus was unknown. For example, “The field was bordered by willow (*Salix* sp.) and we trapped several species of mice (*Peromyscus* spp.)” Use the most widely accepted nomenclature where disagreement occurs.
- For two common food items for fish, do not identify beyond the genus level: daphnia *Daphnia* spp., brine shrimp *Artemia* spp. Use either the common or scientific name, but be consistent within the paper.
- For new species, include the scientific name in the title and use throughout. For new fish species, also provide documentation of the name for the chair of the Committee on Names of Fishes.
- For fish species covered by *World Fishes Important to North Americans* you may indicate alternate common and scientific names: whitefish *Coregonus lavaretus* (known as powan in North America).
- For tilapia species use either the Thys or Trewavas system, but be consistent within the paper.
- Some fish species have more than one common name because of differences in life history. If you discuss only one form in the paper, present it in the usual way: steelhead *Oncorhynchus mykiss*. If you discuss both forms, presentation depends on which is mentioned first: “rainbow trout *Oncorhynchus mykiss*” then “steelhead (anadromous rainbow trout)”; “steelhead *Oncorhynchus mykiss* (anadromous rainbow trout)” then “rainbow trout.”
- Strains are variants maintained by culture: Seneca lake trout *Salvelinus namaycush*. If the strain name does not indicate the species in question, clarify the information in the title, abstract, and text; e.g., a title would refer to “koi carp” and the abstract and text would indicate the species with a phrase such as “koi, a variant of common carp *Cyprinus carpio*.” Afterward just “koi” may be used.

- Stocks are populations managed as a unit and usually have geographic names: Chesapeake striped bass *Morone saxatilis*.
- Runs consist of members of a species that are migrating to spawn in a particular season: fall (or fall-run) chum salmon *Oncorhynchus keta*.
- Present names of hybrids in the abstract and text; include gender of parents if necessary: sunshine bass (female white bass *Morone chrysops* × male striped bass *M. saxatilis*). You may use common names of hybrids in *Names of Fishes* without indicating the parent species.
- Form most fish name plurals by adding *s* or *es*, with stem changes as required; e.g., bluegills, guppies, ciscoes, walleyes, alewives; but steelhead, yellowtail, trout, bass. This is not a complete list, so refer to the dictionary.
- In the following cases, more than one plural is acceptable: Dolly Varden(s), drum(s), kokanee(s), ruffe(s), sculpin(s), sturgeon(s), tilapia(s). Make usage consistent within an article.

Manuscript Components

Manuscripts should typically be assembled in this order: (1) Title and Author Information (on one page); (2) Abstract (on the second page); (3) Introduction (starts third page), Study Site (if needed), Methods, Results, Discussion, Supplemental Material captions, Acknowledgments (all run-on in successive pages); (4) References, all text footnotes; (5) Tables ; (6) Table Captions; (7) Figure Captions (start each on a new page); (8) Figures in separate files; and (9) Supplemental Material files (each in a separate file).

Our policy allows for reasonable flexibility; deviations in format (in addition to those specified in the component descriptions below) should be used sparingly, but are allowed when manuscripts benefit from them. For instance, *Monographs* and *Issues and Perspectives* essays will often have unique formats and some papers may combine, omit or add components.

Title
Author information
Abstract
Introduction
Study site
Methods
Results
Discussion
Supplemental Material (including Archived Material)
Acknowledgments
References

Tables and Table Captions Figures and Figure Captions

Title

The title should accurately reflect a paper's content. The best titles—those that attract a reader's attention and interest—are usually short (a dozen words or less; there is a 15-word limit) and crisp. For fishes, Latin binomials covered in the *American Fisheries Society's Common and Scientific Names of Fishes from the United States, Canada, and Mexico* should not be included in the title. Taxonomic authority names should be omitted from the title except when their names are absolutely needed for clarification.

Author information

Use an asterisk to designate corresponding author, and follow this format to indicate affiliations and present addresses:

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Abstract

The abstract should be a single paragraph typically less than 300 words that summarizes the results and conclusions in concise and declarative prose. Abstracts should neither list the contents (this is presented; that is discussed) nor review the methods. Literature citations, footnotes, abbreviations and acronyms (unless used more than five times) are not allowed in abstracts. Abstracts obviate the need for formal text summaries. Because they are widely circulated by abstracting services, abstracts have much larger readerships than do full papers, and the abstract should represent the text fairly and accurately. Abstracts are optional for *Issues and Perspectives*.

Introduction

An introduction should set the context for the work to be reported and establish the purpose and importance of that work. It also should demonstrate the authors' awareness of the most pertinent literature, including review articles. However, a comprehensive literature survey may be deferred to the discussion section if this is more appropriate. Relevance of the work to conservation and management should be included often in or near the final paragraph. The last paragraph should also clearly and succinctly detail the study objectives.

Study site

Some manuscripts may need a detailed site description, which can be given in this section of the manuscript. Limit the information to that needed for an understanding and interpretation of the results. If only a few words or sentences are needed to locate and describe the study site, include them in the Methods. Maps are not required in all cases, but are often beneficial.

Methods

Methodologies can be tedious to read, but it is better to be overly explicit than to omit details needed by a reader to evaluate the data or repeat the study. Clarity of expression is as important in the methods section as it is elsewhere in the paper. If the experimental protocol and equipment are particularly complex, they can be displayed in a table or figure (including photos). Similarly, the numerous variables needed for some mathematical developments may be listed and defined in a table. Long papers that report diverse research may benefit if methodological details are split up and regrouped together with the respective

results. This can help the reader to associate the data with the respective procedures. In such cases, a formal methods section can be restricted to matters common to all or most of the experiments: sources of fish, equipment, chemical analyses, or statistical tests, for example. Some papers, such as those concerned wholly with techniques or models, as well as review articles, may not need a separate methods section.

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Results traditionally follow methods, and need not be explicitly labeled as such if a more descriptive subheading is available. If results are presented in tables or figures, it is pointless to describe them exhaustively in prose as well; the text can be devoted to summary statements and analyses. Display data in tables if precision is important, in figures if trends are paramount. Authors should take special care to critically evaluate large data sets and appendices to determine which should be submitted as Supplemental Material. Statistical testing is an important part of most analyses, but it should not obscure biological insight. Most importantly, the statistical designs and models used should be appropriate for the study. Although many scientific decisions are based on a statistical probability of error of 5% or less, we have no requirements regarding significance levels. Decision probabilities should balance the sacrifice of biological information against the consequences of being wrong.

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The value of a paper can be greatly enhanced by a good discussion. This is the place to relate what has been learned to what is known, to create new syntheses, to search for generalities, to establish basic principles. The weakest discussions are brief literature surveys appended to mechanical restatements of the results; these usually should be integrated with the results in a single section of the paper. The strongest discussions are true scientific essays that materially advance understanding of their respective fields. Most discussions fall between these extremes because they are founded on limited research objectives, but a thoughtful and scholarly discussion can transform a pedestrian paper into a remarkable one. The quality of a discussion is inversely related to redundancy, wordiness, and unfounded speculation. It is better not to make a point than to burden it with a paragraph of qualifications. The work of others, when cited, should be attributed carefully and accurately. Transitions from evidence to intuition need explicit identifications.

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Maps should contain a compass direction indicator (e.g., north arrow) and a scale bar or labeled latitude and longitude lines when they do not detract from the message of the figure. Provide inset maps to provide geographic context at a readily recognizable scale. Label maps down to at least the state or province level using the full name unless recognized abbreviations are necessary for cluttered figures. Include full disclosure whenever digital images have been electronically manipulated or enhanced.

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And in the References section:

Liedtke TL, Weiland LK, Mesa MG. 2015. Vulnerability of larval lamprey to Columbia River hydropower system operations—effects of dewatering on larval lamprey movements and survival. U.S. Geological Survey OpenFile Report 2015-1157, Reston, Virginia (see *Supplemental Material*, Reference S1).

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Acknowledgments

Place grant and contribution numbers and organizations in the acknowledgments; provide details about who has funded research whether the funders had any role in the research and its publication, and, if so, exactly what this was. Acknowledge only people and institutions that contributed directly to the research or to the manuscript's quality. Consider acknowledging the reviewers and Associate Editor for revisions where you believe they made a positive contribution to the quality of the manuscript (e.g., "Two anonymous reviewers and the Associate Editor provided comments that improved an earlier version of this manuscript"); please do not acknowledge the Editor-In-Chief as they prefer to maintain the ability to remind authors to consider acknowledging the reviewers and other editors without being self-serving.

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- Cite both of two authors, but for three or more give only the first author plus “et al.” Arrange multiple citations chronologically (oldest first) in a text sentence.
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<http://www.fws.gov/endangered/esa-library/pdf/ESAall.pdf>

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However, see the exception for AFS book series in (3) below. Use this format for book-length publications such as monographs and symposia as well.

Crawshaw LI, Lemons DE, Palmer M, Messing JM. 1982. Behavioral and metabolic aspects of low-temperature dormancy in the brown bullhead, *Ictalurus nebulosus*. *Journal of Comparative Physiology B* 148:41–47.

Hochachka PW. 1990. Scope for survival: a conceptual “mirror” to Fry’s scope for activity. *Transactions of the American Fisheries Society* 119:622–628.

Kennedy VS. 1990. Anticipated effects of climate change on estuarine and coastal fisheries. *Fisheries* 15(6):16–24.

Kent ML, Traxler GS, Kieser D, Richard J, Dawe SC, Shaw RW, Prosperi-Porta G, Ketcheson J, Evelyn TPT. 1998. Survey of salmonid pathogens in ocean-caught fishes in British Columbia, Canada. *Journal of Aquatic Animal Health* 10:211–219.

Petersen MR, Weir DN, Dick MH. 1991. Birds of the Kilbuck and Ahklun Mountain Region, Alaska. *North American Fauna*. 76:1–158. doi: 10.3996/nafa.76.0001

(2) Book: Author(s) or editor (s). year. Title. edition (other than 1st) or Volume (if part of a series). City, State, Province, or Country (only if needed to locate city): Publisher. Other identifying information. Omit the number of pages.

[APHA] American Public Health Association, American Water Works Association, and Water Environment Federation. 1992. Standard methods for the examination of water and wastewater. 18th edition. Washington, D.C.: APHA.

Hoar WS, Randall DJ, editors. 1988. *Fish physiology*. Volume 11, part B. New York: Academic Press.
Rheinheimer, G. 1985. *Aquatic microbiology*. 3rd edition. New York: Wiley.

(3) Article in a book (including those in the AFS book series—Special Publications, Symposia, and Monographs): Author(s). year. Article title. Inclusive pages in editor(s). Book title. City, State, Province, or Country (only if needed to locate city): Publisher. Other identifying information.

Identify conference proceedings by year of publication, not by the year of the meeting, and give the publisher's name and location (i.e., where the proceedings may be obtained), not the location of the meeting.

Adams SM, Breck JE. 1990. Bioenergetics. Pages 389–415 in Schreck CB, Moyle PB, editors. Methods for fish biology. Bethesda, Maryland: American Fisheries Society.

Campton DE. 1995. Genetic effects of hatchery fish on wild populations of Pacific salmon and steelhead: what do we really know? Pages 337–353 in Schramm HL Jr, Piper RG, editors. Uses and effects of cultured fishes in aquatic ecosystems. Bethesda, Maryland: American Fisheries Society. Symposium 15.

Livingstone AC, Rabeni CF. 1991. Food-habitat relations of underyearling smallmouth bass in an Ozark stream. Pages 76–83 in Jackson DC, editor. The first international smallmouth bass symposium. Bethesda, Maryland: American Fisheries Society.

(4) Thesis or dissertation: Author. year. Title. Master's thesis or Doctoral dissertation. City, State, Province, or Country (only if needed to locate city): University.

Omit state after city if included in the university name.

Chitwood JB. 1976. The effects of threadfin shad as a forage species for largemouth bass in combination with bluegill, redear, and other forage species. Master's thesis. Auburn, Alabama: Auburn University.

Hartman KJ. 1993. Striped bass, bluefish, and weakfish in the Chesapeake Bay: energetics, trophic linkages, and bioenergetics model applications. Doctoral dissertation. College Park: University of Maryland.

(5) Government publication: Author(s) or agency. year. Title. City, State, Province, or Country (only if needed to locate city): Agency. Type and number of publication.

Omit state or province after city if included in the agency name.

[EPA] U.S. Environmental Protection Agency. 1986. Quality criteria for water. Washington, D.C.: EPA. Report 440/5-86-001.

Gimbarzevsky P. 1988. Mass wasting on the Queen Charlotte Islands: a regional inventory. Victoria: British Columbia Ministry of Forests and Lands. Land Management Report 29.

(6) Contract report: Author(s). year. Title. Organization that issued the report (if different from the author) to Organization that received the report, Receiver's city, state, province, or country (only if needed to locate city).

Smith AB. 1986. Turbine-induced fish mortality at Highrise Dam, 1985. Report of Robertson Consultants to Prairie Utilities, Jonesville, Alberta.

(7) Internet: Author(s) or agency. year. Title. Publisher or Publication. [volume:page numbers]. Available: URL (month and year accessed). [DOI:]

Items in brackets are optional.

Baldwin NA, Saalfield RW, Dochoda MR, Buettner HJ, Eshenroder RL. 2000. Commercial fish production in the Great Lakes 1867–1996. Great Lakes Fishery Commission. Available: www.glfsc.org/databases/commercial/commerc.php (September 2000).

Villeneuve DL, Wang RL, Bencic DC, Biales AD, Martinovic D, Lazorchak JM, Toth G, Ankley GT. 2009. Altered gene expression in the brain and ovaries of zebrafish (*Danio rerio*) exposed to the aromatase inhibitor fadrozole: microarray analysis and hypothesis generation. *Environmental Toxicology and Chemistry* 28:1767–1782. Available: www.setacjournals.org/perlserv/?request=get-abstract&doi=10.1897/08-653.1&ct=1 (October 2009). DOI: 10.1897/08-653.1

(8) Other electronic sources: Author(s) or agency. year. Title. Medium: description [if necessary] (availability).

King, S. 2009. New parasite species in Irion County, Texas prairie dogs. 1 CD-ROM: color, 4¾ in. (from the author).

Smith, EH. 2009. Fewer salmon in the Pacific Northwest. Kindle DX version (retrieved from Amazon.com).

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- A picture can be worth a thousand words. Figures consisting of high quality photos of the species of study are strongly encouraged, especially interesting, cryptic, unusual, or lesser-known species (e.g., [Figure 1](#) in Halstead et al. 2011). We also encourage photos of lesser-known habitat types (e.g., [Figure 1](#) in Lynch et al. 2011), difficult to describe apparatuses (e.g., [Figure 2](#) in Kremetz et al. 2011) or any other interesting and informative subject that better informs and engages the reader. All Figures are published at no costs to authors. In some cases, we may request your permission to use your photograph for the cover image in your Issue.
- Minimum dpi (dots per inch) for Line Drawings is 1200 dpi; Combination Figures should be at least 600 dpi; Grayscale or Color Figures should be at least 300 dpi.
- Publishing images from Google maps (or other providers that are not in the public domain) is not permitted.
- Labels should describe the x- and y-axes clearly. Place the y-axis label to the left of the axis and orient it to read sideways from bottom to top of the graph. Photomicrographs may be reduced during printing and should contain a scale bar directly on the photograph; give the equivalent length either on the bar or in the figure caption.
- All letters should be at least 1.5 mm high (6-point type) after the figure is reduced; avoid bold fonts. A figure that is 20 cm wide when drawn can reduce to one column if the smallest original lettering is at least 4.5 mm high (18-point type). Letter size and line thickness (including axes) should vary no more than twofold on a figure. Reduction can cause pattern fill in charts to become distorted or to moiré; shaded fill or very simple, large patterns are preferred. Figure reduction can cause symbols and shadings to look alike, dashed lines to become continuous, and dotted lines to disappear, so choose elements that will retain their clarity and contrast when reduced and published. Keep graphics simple and uncluttered. Avoid unnecessary use of three-dimensional charts, black borders, and shaded fill. If shaded fill is used, keep it in the range of 30–70% of black for best reproduction. Keep blank space to a minimum by placing axis labels near the axes, multiple panels close together, and “outlier” words (compass directions,

scale bars, keys) within the margins of the figure. Carefully planned figures enhance a paper's message and can reduce publication costs.

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