

AFS Publications Style — Shorter Version

This document provides a quick reference to the most important elements of AFS publications style. The relevant sections of the more detailed style guide are noted.

Abbreviations and Acronyms (Chapter 1, Appendix B)

As a rule, spell out abbreviations and acronyms at first use:

Polymerase chain reaction (PCR) was used to . . .

The principal exceptions are well-known abbreviations and acronyms with entries in *Merriam-Webster's Collegiate Dictionary* (e.g., DNA) and the standard ones listed in AFS journals and books.

Abbreviations and acronyms should not be used at the beginning of a sentence:

Analysis of the specimen's DNA showed. . . . *not* DNA analysis showed. . . .

The following abbreviations may only be used in parenthetical expressions:

e.g. i.e. etc.

Certain abbreviations may be used in place names and addresses:

St. [Saint] Mt. [Mount] D.C. U.S. [as adjective] USA [as noun] UK
NE NW SE SW -st -nd -rd -th

All other elements of place names and addresses must be spelled out:

1234 Massachusetts Avenue Post Office Box 95 Augusta, Maine

Capitalization (Chapter 2, Appendix D)

Capitalize the names of genera, families, orders, classes, phyla, and kingdoms, along with the first component of species names:

Oncorhynchus Salmonidae (*but* salmonids) Salmoniformes *Ictalurus punctatus*

Capitalize the names of organizations, formal programs, places, topographical features, major structures, and ships as well as personal titles when they are used with the person's name:

U.S. Government (*but* Canadian government) the Chesapeake Bay Program
the Province of Ontario Catskill Mountains Grand Coulee Dam Lock 19 RV *Seth Gordon*
Secretary of the Interior Norton (*but* the secretary of the interior)

However, do not capitalize the names of topographical features if they are purely descriptive:

Hudson River valley upper Mississippi River

Do not capitalize generic terms used in the plural:

Rappahannock and Rapidan rivers

Capitalize the formal names of software programs and certain trade names:

Restriction Enzyme Analysis Package
Plexiglas Styrofoam *but* formalin petri dish

See *Merriam-Webster's Collegiate Dictionary* to determine which trade names to capitalize.

Do not capitalize terms relating to general concepts, even when they include a person's name:

index of biotic integrity Spearman's rank correlation coefficient

Capitalize such terms as "table," "figure," and "chapter" when they refer to specific items and such terms as "methods" and "results" when they refer to sections of a paper; do not capitalize other identifying labels:

Table 1 Figure 2 Chapters 5–7

For additional details, see Methods. As noted in Results, . . .

experiment 2 tank 3

Italics (Chapter 3)

Italicize genus and species names:

Acipenser spp. *Esox lucius*

Italicize single-letter mathematical and statistical terms except for Greek letters:

L_t L_1 r^2 F -value $P \leq 0.05$ β

Italicize all elements of gene and allele designations and all elements of microsatellite designations except Greek letters:

*mAAT** *EST-1** **150* *Oneμ3*

Italicize certain other technical terms and abbreviations (see Chapter 11 and Appendix B):

Taq chlorophyll *a* *g* [gravity] *F* [fishing mortality]

Mathematics and Statistics (Chapter 4)

Italicize single-letter mathematical and statistical terms except for Greek letters:

z s^2 W_r $y=f(x)$ t -test β L_{init}

Denote logarithms by the abbreviation “log” and indicate the base by a subscript:

\log_e \log_{10}

Hyphenate most terms in which “log” is used as a prefix but not terms with “log_e” or “log₁₀”:

log-likelihood function log-linear model log-transformed data *but* lognormal(ity)

log₁₀ transformation log_e transformed data

Use bold type for vectors and matrices:

x **U** **w** × **y** **z**·**x**

In equations, break lines before operators and use spacing, parentheses (etc.), and center dots or times signs to group terms logically:

$$\log_e(N_{t+1}) = \log_e(\alpha) + \log_e(N_t) - \log_e[1 + (N_t/\gamma)]^\beta$$

Use the sequence { [()] } for grouping terms.

If there are only a few variables, define them within a sentence in the text; otherwise use a vertical list.

Refer to numbered equations as follows:

equation (1) equations (2) and (3)

but The most reliable estimates (from equation 7) . . .

Present simple summary statistics as follows:

(mean, 2) (mean = 2) 3.2 ± 0.84 (mean \pm SD)

Present test statistics as follows:

were not different ($F = 0.93$; $df = 4, 22$; $P = 0.46$)

Specify the type of test (e.g., ANOVA) if it is not obvious or is not clear from the text.

Numbers and Measurements (Chapter 5)

NUMBERS

As a general rule, spell out numbers less than 10 unless they are used with units of measure:

four anglers six white bass 12 boats

4 cm 7 weeks

Always spell out numbers at the beginning of a sentence:

Twelve repetitions were. . . .

Use numerals for all numbers that apply to the same or similar items when any of those numbers are greater than 9 and they occur in close proximity to one another:

4 rainbow trout and 12 striped bass

Use commas in numbers of more than three digits unless they are coefficients, and use leading zeros with decimal numbers less than 1.00:

1,234 1829.*x* 0.05

Use scientific notation for very large or small numbers:

3.4×10^6 1.94×10^{-3}

Either the American or European convention may be used for dates:

March 29, 2002 *or* 29 March 2002

Use the 24-hour clock to express time:

1545 hours 0030 hours

MEASUREMENTS

Metric units (i.e., the units of measure included in the International System of Units) must be used in all AFS publications except the *North American Journal of Fisheries Management* and the *North American Journal of Aquaculture*. If English units are used, they must be used throughout the paper.

Units of measure are generally abbreviated when preceded by a number and spelled out otherwise:

3 km *but* a few kilometers

The following units are always spelled out:

acre ton year month week

Lists of acceptable abbreviations are available for the individual journals and books.

Operators such as =, >, and < may only be used in parentheses:

Trophy fish (>380 mm). . . *but* Fish weighed 2.9 ± 0.35 kg.

There is no space after the > in the first example because it is used adjectivally.

The unit of measure should be given only once if the measurement is written with a space between the number and the unit of measure:

from 6 to 10 mm in length between 2% and 4% (*but* 5, 6, and 7%)

Ranges may be expressed in any of the following ways:

from 72 to 84 s between 72 and 84 s 72–84 s (*not* from 72–84 s)

Ratios may be expressed in various ways:

12 h light: 12 h dark 4.29 mg/L 15 g·m⁻²·d⁻¹

At first mention, state concentrations precisely:

1 µg of gentamicin/mL of water *not* 1 µg/mL gentamicin

in a 10% solution of formalin *not* in 10% formalin

Salinity (measured as parts per thousand) is usually expressed by means of the per mille symbol (‰). Otherwise, parts per thousand, parts per million and parts per billion should be expressed as indicated in the following table:

Concentration	Weight : volume	Weight : weight	Volume : volume
Parts per thousand	g/L (mg/mL)	g/kg (mg/g)	mL/L (µL/mL)
Parts per million	mg/L (µg/mL)	mg/kg (µg/g)	µL/L (nL/mL)
Parts per billion	µg/L (ng/mL)	µg/kg (ng/g)	nL/L (pL/mL)

Punctuation (Chapter 6)

COLONS

A colon may be used to introduce a secondary clause that is closely related to the main clause when emphasis is desired:

This often leads to a serious problem: noncomparable data.

A colon may be used to introduce a list, provided that it does not come between a verb and its object or after an expression like “such as” and “namely”:

The following treatments were administered: x, y, and z. *but* The treatments were x, y, and z.

Certain substrates were preferred, namely, sand, gravel, and cobble.

A colon may be used to indicate a ratio:

strontium : calcium [note spaces] Sr:Ca 1:1

COMMAS

Commas should be used after items in a series:

egg, alevin, and fry stages *not* egg, alevin and fry stages

Commas should be used after introductory phrases:

After an acclimation period of 72 h, the fish. . . .

(See sections 6.5–6.7 for exceptions to this rule.)

Commas should be used with material of a parenthetical nature:

The dependent variable, y_n , was defined as. . . .

Use semicolons rather than commas to separate independent clauses that are joined by adverbs such as “however” and “therefore” (see section 6.8 for additional ones):

Tests showed no significant differences between groups 1 and 2; therefore, these groups were pooled in subsequent analyses.

ELLIPSES (DOTS)

Ellipses are used to indicate omissions in quotations (note the spaces and the fact that four dots are used at the end of a sentence):

“Fisheries management draws on bioenergetics, genetics, . . . and other specialties.

This finding was considered definitive. . . .

EM AND EN DASHES

Em dashes may be used to emphasize material of a parenthetical nature:

Determining the toxicity to fish—the principal goal of the experiment—was problematical.

En dashes are principally used to indicate a range of numbers or other sequential items:

6–10 mm May–July 1996 *but* Project 83-465

En dashes are also used as a replacement for “and,” “to,” and “at” in compounds:

Beverton–Holt University of Wisconsin–Madison *but* Smith-Root [trade name]

HYPHENS

Hyphens are used primarily in compound words (see Chapter 10 and Appendix A for additional details), compound names, grant and project numbers, and chemical names:

gill-net fishery Cavalli-Sforza Project FWS-97-12 glucose-6-phosphate dehydrogenase

SEMICOLONS

The most common use of semicolons is to connect closely related clauses:

The finding of . . . was highly unusual; as a result, we. . .

Semicolons may also be used to separate items in a list when they are lengthy or complex:

We obtained fish samples from the following reaches (indicated by river kilometers): 67–73, which is free-flowing; 47–51, which is impounded by the dam; and 6–11, which is largely regulated by dam operations.

In AFS publications, semicolons are also used to separate citations and to group items in parentheses logically:

(Smith 1999; Thompson 2001)

($F_{1,29} = 7.98$, $P = 0.034$; Table 1)

SOLIDI (FORWARD SLASHES)

In text, a solidus is equivalent to the word “or”—not the word “and.” To avoid ambiguity, spell out compound terms rather than using solidi:

morbidity and mortality *not* morbidity/mortality

Quotations (Chapter 7)

Quotations of three printed lines or less should be placed directly in the text and indicated by double quotation marks:

Smith (2000) found “a significant degree of hybridization” among the fish at this location.

Quotations of more than three printed lines should be separated from the text:

Thompson et al. (1999:57) reported that

[t]he incidence of parasitic infection was significantly ($P < 0.05$) greater in brown bullheads *Ameiurus nebulosus* from Hopkins Pond than in those from the Schuylkill River. However, the relationship between pollution and parasitic infection was unclear in the small samples that were taken.

Place periods and commas inside quotation marks, colons and semicolons outside.

Place dashes, question marks, and exclamation points inside quotation marks when they are part of the quoted material, outside when they apply to the entire sentence:

Many researchers have asked the question, “How do we proceed in the face of such uncertainties?”

How should fisheries biologists “sample selectively”?

Words used as words or in an unusual context may be put within double quotation marks (not italics or single quotation marks):

The term “eutrophic” generally refers to waters with excess nutrients.

These XX “males” were then allowed to breed with normal females.

References (Chapter 8)

AFS publications use the author–date system for references, with brief parenthetical citations in the text and full references in an alphabetical list at the end:

Text: . . . similar findings (Gorman and Karr 1978).

Mills (1989) states that. . .

Reference list: Gorman, O. T., and J. R. Karr. 1978. Habitat structure and stream fish communities. *Ecology* 59:507–515.

Mills, D. H. 1989. Ecology and management of Atlantic salmon. Chapman and Hall, London.

For a synopsis of the principal reference formats, see the “Guide for Authors” in any of the four AFS journals (first issue of each year).

Species Names (Chapter 9, Appendix C)

As a rule, give the accepted common and scientific names the first time that a species is mentioned in the abstract and text and use only the (full) common name thereafter. The format for the first mention is as follows:

gizzard shad *Dorosoma cepedianum*

As indicated below, however, there are numerous exceptions to this, depending on the particular species in question, the authority for the names, and the frequency with which they are used.

References to a genus that has already been mentioned may be abbreviated unless they occur at the beginning of a sentence or there is a possibility of confusion (e.g., two or more genera beginning with the same letter):

threadfin shad *D. petenense*

Where appropriate, genus and family names may be used in lieu of species names:

Lepomis spp. in the genus *Micropterus* ictalurids pikes (family Esocidae)

More general references to living organisms do not require scientific names:

coldwater fishes benthic invertebrates

If a common name is long or used frequently and there is no possibility of confusion, it may be shortened after the first use in each paragraph:

trout [for westslope cutthroat trout]

Alternatively, the general term “fish” may be used in such cases.

If the first mention of a species (apart from any in the abstract) occurs in a table or figure, the scientific name should be given there and not repeated in the body of the text, and vice versa. However, for the sake of completeness, a scientific name

that has previously been given in the text may be repeated in a table when the scientific names of other species are first given in that table.

Scientific names should not be used adjectivally unless the alternative is cumbersome:

populations of Chinook salmon *Oncorhynchus tshawytscha*

not Chinook salmon *Oncorhynchus tshawytscha* populations

but Chinook salmon *Oncorhynchus tshawytscha* fry

SPECIAL CONSIDERATIONS

For species in the AFS publication *Common and Scientific Names of Fishes from the United States, Canada, and Mexico* (Special Publication 29), use the accepted common and scientific names in the abstract and text but only the common name(s) in the title.

For species in other AFS publications (e.g., *World Fishes Important to North Americans* [Special Publication 21]), use scientific names in the title as well as in the abstract and text; common names are not required in the title, however, and alternative common and scientific names may be used.

For species in non-AFS publications, use scientific names in the title as well as in the abstract and text; throughout the paper, common names may be used but are not required.

The names of subspecies should be presented as follows:

coastal cutthroat trout *Oncorhynchus clarki clarki*

For species with different common names owing to differences in life history, the practice is as follows: When only one form is mentioned in the paper, it should be presented in the usual way:

steelhead *Oncorhynchus mykiss*

When both forms are mentioned, how they are presented 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, stocks, and runs should be identified as follows:

Seneca lake trout *Salvelinus namaycush*

Chesapeake striped bass *Morone saxatilis*

fall-run [or fall] chum salmon *Oncorhynchus keta*

Hybrids should be identified as follows:

tiger muskellunge (muskellunge *Esox masquinongy* × northern pike *E. lucius*)

When the sex of the parents matters, give that as well.

Either of the two common taxonomic systems (i.e., the Thys and Trewavas systems) may be used for tilapia species:

Nile tilapia *Tilapia nilotica* or Nile tilapia *Oreochromis niloticus*

As far as possible, the names of nonaquatic species should be treated like those of aquatic species:

Douglas-fir *Pseudotsuga menziesii* double-crested cormorant *Phalacrocorax auritus*

However, when there is no common name (e.g., the bacterium *Myxobolus cerebralis*) or no scientific name (e.g., infectious hematopoietic necrosis virus [IHNV]), use the accepted name or its acronym.

Daphnia and brine shrimp are usually identified only to the genus level:

daphnia *Daphnia* spp. brine shrimp *Artemia* spp.

After the first mention, either the common or scientific name may be used:

daphnia or *Daphnia*

The plurals of the names of fish and other organisms follow *Merriam-Webster's Collegiate Dictionary*. In most cases this entails adding an *s* or *es*, but see Appendix C for complete lists.

In some cases, the plural varies depending on whether one is referring to more than one (related) species or more than one individual of the same species:

14 rainbow trout *but* rainbow and cutthroat trout

A similar principle applies to the terms “fish” and “fishes”:

200 [individual] fish *but* many different fishes [i.e., species of fish]

Spelling and Compound Words (Chapter 10, Appendix A)

In AFS publications, the general authority on spelling is *Webster's Third New International Dictionary* (as updated by the current edition of *Merriam-Webster's Collegiate Dictionary*).

In some cases, however, sense or the customary usage in the fisheries profession requires deviations from the forms given in this dictionary. See Appendix A for a list of the accepted spellings of words and phrases commonly found in fisheries writing.

When a word has variant spellings, use the shorter one if they have equal weight (indicated by the conjunction “or” in the dictionary), the first one if they do not have equal weight (indicated by the conjunction “also”):

totaled *not* totalled [equal weight]

cancellation *not* cancelation [unequal weight]

Close up prefixes with the words to which they are attached unless the root word is capitalized or the unhyphenated form would be ambiguous or hard to read:

nonintuitive microorganism

but non-Canadian cross-sectional un-ionized

COMPOUND WORDS

When a compound word serves as a noun, it is generally open (i.e., with spaces between the words):

main stem open water radio tag

Some familiar compounds and technical terms are closed or hyphenated, however:

riverbed seawater age-class eye-up

When a compound word serves as an adjective, the way it is treated depends on the parts of speech of the words that make it up.

Compounds consisting of two or more nouns are usually open:

age structure differentials

Compounds consisting of an adjective and a noun or a noun and a verb participle are usually hyphenated:

main-stem reaches second-order stream oxygen-depleted waters

Compounds containing adverbs are hyphenated except for the adverbs “very,” “most,” “least,” and those ending in “-ly”:

well-written article very respected scientist rapidly changing situation

Compounds containing units of measure are hyphenated:

1.5-mg/L treatment

Compounds that come after the nouns they modify are usually open:

The article was well written.

There are no general rules for compounds that serve as verbs; consult Appendix A or the dictionary to see whether they are open, closed, or hyphenated:

run off dipnet mass-mark

Symbols (Chapter 11, Appendices A and B)

Symbols pertaining to mathematics and statistics are covered under that heading.

CHEMICAL TERMS

Standard chemical symbols may be used for elements, compounds, and equations without further explanation:

P H⁺ NH₃

If a sentence begins with the name of an element or compound, however, that name must be spelled out along with any others that occur in the sentence:

Phosphorus and nitrogen. . . . *not* Phosphorus and N. . . . *or* P and N. . . .

Compounds may also be indicated by their generic and “chemical” names:

formalin rotenone [generic]

17β-hydroxyandrost-4-en-3-one [chemical]

Generic names that appear in *Merriam-Webster's Collegiate Dictionary* or as main entries in the *Merck Index* or *Dorland's Illustrated Medical Dictionary* may be used without a chemical name. Other generic names must be accompanied by a chemical name at first mention.

Acronyms that appear in *Merriam-Webster's Collegiate Dictionary* do not need to be spelled out:

DDT EDTA

Compounds may be referred to by trade name, but the generic name or a general description must be given at first mention:

MS-222 (tricaine methanesulfonate)

the vaccine Furogen 2

Fatty acids may be indicated by name (e.g., linolenic acid) or by notation of the sort

18:2(n-6) *or* 18:2(ω-6),

where the number to the left of the colon is the number of carbon atoms in the compound, the number immediately to the right of the colon is the number of double bonds, and the number after the hyphen indicates the position of the first double bond from the methyl end.

The numerical notation must be accompanied by an explanation.

ENZYMES

At first mention, standard enzymes (those with names ending in “-ase”) are referred to both by name and by the numbers assigned to them by the Nomenclature Committee of the International Union of Biochemistry and Molecular Biology:

creatine kinase (enzyme number 2.7.3.2; IUBMB 1992)

Na⁺,K⁺-ATPase (3.6.1.36)

The following citation should appear in the list of references:

IUBMB (International Union of Biochemistry and Molecular Biology). 1992. Enzyme nomenclature 1992. Academic Press, San Diego, California.

After full identification, enzymes may be abbreviated according to the conventions adopted by the Fish Genetics Nomenclature Committee of AFS's

Fish Genetics Section (see J. B. Shaklee et al. 1990. Gene nomenclature for protein-coding loci in fish. Transactions of the American Fisheries Society 119:2–15, especially Tables 1 and 2):

CK [creatine kinase]

bGAL *or* βGAL [beta-galactosidase]

sAAT, mAAT [cytosolic and mitochondrial aspartate aminotransferase]

IDHP-1, IDHP-2 [isozymes of isocitrate dehydrogenase]

Restriction enzymes (also known as endonucleases) are derived from bacteria and have a different nomenclature that reflects their origin:

Taq *Acc* I *Hinc* II

GENETICS

Genes (also known as loci) are designated by the abbreviations of the enzymes they encode, with two typographic differences: (1) an asterisk follows the enzyme abbreviation, and (2) the entire expression (including the asterisk) is italicized:

*CK** *bGAL** *sAAT** *IDHP-1**

The following list shows the treatment of other genetic symbols:

Subunits:	<i>ND-4</i>
Haplotypes:	<i>MYS21</i>
Alleles:	<i>EST-2*1</i> <i>or</i> <i>*1</i> [when gene is obvious]
Microsatellites:	<i>Ots1</i> <i>One</i> μ3 [Greek letters not italic]
Filial generation:	<i>F</i> ₁
Fixation indexes:	<i>F</i> _{ST}

HORMONES AND ANTIBODIES

Hormones and antibodies may be denoted by their standard abbreviations or acronyms but must be spelled out at first mention:

luteinizing hormone releasing hormone (LHRH)

immunoglobulin A (IgA)

LETHAL CONCENTRATIONS AND DOSES

Terms indicating lethal concentrations and doses may be abbreviated but must be explained in full at first use:

the concentration [dose] that was lethal to 50% of the test organisms over the first 96 h (LC50 [LD50])

the dose that produced a cytopathic effect in 50% of the inoculated cultures (TCID50)

Note that the percentage of organisms affected and the time of exposure may vary and that numbers such as 50 are not treated as subscripts in AFS publications.

Tables and Figures (Chapter 12)

For a concise statement of the style requirements for tables and figures, see the “Guide for Authors” in any of the four AFS journals (first issue of each year).

Vendors and Commercial Products (Chapter 13)

AFS style gives authors a lot of leeway in referring to the commercial products (feeds, chemical compounds, equipment, and so forth) used in their research. The following formats are all acceptable:

- a backpack electrofisher
- a backpack electrofisher (Smith-Root, Inc.)
- a backpack electrofisher (Smith-Root, Inc.; Model 12)
- a backpack electrofisher (Smith-Root, Inc., Vancouver, Washington)
- a backpack electrofisher (Smith-Root, Inc., Vancouver, Washington; Model 12)

- a Smith-Root backpack electrofisher
- a Smith-Root Model 12 backpack electrofisher
- a Smith-Root (Vancouver, Washington) backpack electrofisher
- a Smith-Root (Vancouver, Washington) Model 12 backpack electrofisher

If detailed references to producers are given, they need only be given the first time that each producer is mentioned:

- . . . phosphate-buffered saline (Sigma Chemical Co., St. Louis, Missouri) [first mention]
- . . . an enzymatic glucose assay (Sigma) [subsequent mention]

Word Usage (Chapter 14)

AFS publications restrict the use of a number of words and phrases in the interest of clarity, technical accuracy, and professionalism (e.g., there is an important distinction between “compare with” and “compare to”). No concise statement of these restrictions is possible; see Chapter 14 of the more detailed style guide for the complete list.