Tips for Scientific Writing

General tips:

#1: Read the literature and pay attention to the structure of papers.

#2: Use your grammar and spell checkers. No excuses for misspellings.

#3: Buy and READ Strunk and White.

#4: Follow the general rules for authors of ESA journals()

#5: Have others read and critique your writing.

#6: Start with Methods, then Results, then Introduction, then Discussion

#7: Adhere, as much as possible to these general rules of structure:

Introduction:

What is the BIG question?

Why is this question important?

What is the history of research that led up to this question and identified it as important?

How is your study new and advancing the answer to the question? What sets it apart from previous work?

CITE that literature properly: (Bobo 2008, Bobo and Bubba 2008, Bobo et al 2008, Bubba 2009, Bubba and Bobo 2010) Cite literature in (1) chronological order, then (2) alphabetical order. More than three authors per article is always summarized as “First author et al.”
What general hypotheses are you going to test in order to answer your question?

What system/species are you going to test your hypotheses and why is it a particularly appropriate system to do so?

**Methods:**

Goal of the following structure is to tell the reader **WHY** you did what you did before you describe **WHAT** you did!!!!

**General approach:** Lab or field study? Observational or experimental (what constitutes an experiment?) Comparative? Combination of these?

“To test our hypotheses, we…” describe general approach.

**System description:** What is the ecosystem and species you are testing your hypotheses in? WHY is this an appropriate system (support more what you mention in Intro.)? Why these species, why this ecosystem? Describe location with lat, lon in sufficient detail so someone could revisit and resample your study system.

**Outline** by general hypotheses:

Use subheadings for EACH general hypothesis

To test this… we tested the **specific hypothesis** that IF this, THEN that.

**Design** of test of hypothesis: Test of differences among treatment levels (categorical variables). Test of a correlation of relationship (continuous variables). Test of response of multiple variables (multivariate variable).

Integrate the sampling and experimental design with the analytical/statistical design. Link the methods with how they will be used in a statistical analysis.

What constitutes a replicate sample, how are they independent, is the number and size of samples sufficient?
Describe the statistical analysis (e.g., parametric or non-parametric? T-test, analysis of variance (ANOVA), repeated measures, multivariate analyses).

Describe how you would interpret the results of your tests with respect to rejecting the alternative or null hypothesis.

Bottom line of all of the above… Tell the reader **WHY** you did what you did before you describe **WHAT** you did!!!!

**Methods** used to (1) create manipulations (e.g., cages, aquaria in lab) ans (2) sample (e.g., density or percent cover estimates along transects or in quadrats). How you collected and processed samples (in sufficient detail that the study could be replicated!)

**Results:**

Summarize general results with respect to hypotheses.

**Outline** by same hypothesis subheadings you create for the Methods.

State results and interpretation in context of each hypothesis, then state results of statistical analyses parenthetically (ANOVA; F= X, P= 0.07) (t-test: t= X, P= 0.02).

Emphasize effect sizes when stating results, NOT the results of a statistical analysis.

Example: “As predicted by the hypothesis, the survival rate of mussels in the predator exclusion was ten times greater than mussels exposed to predators (Figure 3, t-test: t=XX, P= 0.001).”

Cite Figures and Tables at end of sentence parenthetically.

Example: “Yada yada (Figure X).”

Do NOT refer to a figure within the sentence.

Example: “Figure 3 shows yada yada…”

Move on to next hypothesis…
Do NOT interpret the results… save for the Discussion section.

**Table and Figures:**

Dependent variable on Y axis, independent variable on X axis.

Order figure axes labels or table rows and columns to demonstrate order of response variables.

Axis labels need units of the variables that are graphed.

Sea Urchin density (Individuals per 10m²)

Look to the literature to see how it is done!

**Table and Figures legends: Mandatory…**

First summarize what the table or figure is depicting: “The positive relationship between Y and X.”

Second, explain the graphed variables.

Third, summarize results of statistical analyses.

**Discussion:**

Briefly summarize key results with interpretation. Do not simply restate the results section.

State why you think you did or did not get results predicted by the hypotheses. Were there problems that adversely affected the study? Describe them and how they may have affected your results and conclusions (e.g., insufficient sample size to detect differences between treatments… not just say “we should have sampled more”)

Suggest mechanisms for results (behavioral, species interactions, environmental drivers).

Describe results in context of previous work (with citations!) and how your results compare (similar or different and if different, why?).
State overall conclusions and their implications for our ecological understanding and for informing management.

**Literature Cited**

In alphabetical order.

Single author first, then by alphabetical order.

Last name and initial of first author, the first initial and last name of all other authors on the publication.

See exact structure of authors, year of pub., title of pub., Journal name, Issue of journal and pages of article.

Example: