Grazing Meta-analysis FAQ

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# Investigators

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# Q. What level of replication goes into the replication column. For example, if I have 25 traps, over two years, and in four treatments?

## A. Replication is any treatment or factor that has been repeated to increasing the validity in the reported findings. It is represent by the number of observations within a treatment block (i.e. “little” n). In the example provided, 25 traps would be the replication, while years and the treatments are factors. If not clear, sometimes looking into the calculation of standard error can help resolve what replication was used, because standard error = stdev / sqrt (n).

# Q. The study compares grazed to ungrazed, but are vague in the description of grazing or the measure is indirect. Should this paper be included?

## A. Indirect measures of grazing are acceptable, such as cow dung or track prints. Meta-analysis techniques compare within studies first before among studies allowing comparisons between different methodologies. However, there needs to be some explicit description of what a grazed treatment is and how it is quantifiably different from an ungrazed treatment. Generally, it is better to be more conservative in what is included, because even a smaller subset of the total studies we accept will be included in the final product. Parallel and consistent data structure is key.

# Q. What if a paper did not include error measures?

## A. Calculation of effect-size estimates requires mean, standard deviation (or standard error), and the number of replicates (n). If the authors report a count or percent abundance without error, these datasets cannot be used. The exception is if the author provides the original, raw data that these summary statistics can be calculated from.

# Q. I found the perfect paper, but it is missing data that I cannot extract!

## A. Contact the author using the template email provided. In the evidence spreadsheet, under the “excluded?” column put “contacted author” and fill out as much of the other columns as possible.

# Q. Do I include studies that compare different grazers in the same system.

## A. The study needs to compare the effects of grazer on another animal. Comparisons of different grazers on the plant community without any interactions is not usable.

# Q. What do I do with studies that included other treatments, such as fire or mowing.

## A. Only include the treatment that is the control (ungrazed) and the grazed treatment. The other treatments can be ignored.

# Q. Should there be separate columns with units in the template datasheet?

## A. The template dataset has only one column where units should be added. The “Grazing.estimate” column should present the units that the grazers were measured in (e.g. cattle/ha, heads/km2). The “Estimate” column is a description of the measured response variable (e.g. richness, abundance, density) and generally does not need to have units reported it is something different than a similar measurement in the same study. For example, if the same study had density of birds per km2 and density of plants per m2. The “last.grazed” column should always be in years and the other columns should not require units.

# Q. So if the same study uses different units for the abundance estimates for plants vs. small mammals (for example), you do or do not want us to record them?

## A. Correct! The comparisons will be plant-to-plant and animal-to-animal so units just need to be preserved between taxa. Comparisons of plant-to-animal will be handled in a different way and the units will not be relevant.

# Q. I found some studies report potential useful information that currently wouldn’t be recorded (e.g. different “functional groups” for nematodes, such as predator, frugivore, etc.). Do you want us to add a separate column to input this information in the template datasheet? What about studies that just look at plant functional groups (e.g. shrubs and forbs).

## A. Yes! If you find information that might be useful, but extends beyond the columns proposed on the template, please feel free to add. Preferably add these additional columns after the “value” column to preserve the original structure.

# Q. If the authors measured plant abundance/cover estimates but don’t report them, do you want us to contact the authors for this?

## A. No. The plant analyses are ancillary to our research project and the effort of rounding up plant measures are not worth it.

# Q. Difference between site and habitat. For example, one of my papers only looks at one site, but measures things within four habitats within the site...does my site # become 4 in this case?

## A. Tricky question! There is some subjectivity in the site measure and this will be used in our qualitative descriptions so it is okay if a bit imprecise. Site should be the largest unit that the different treatments or blocks are composed of. In the provided example, I would agree 4 sites would be the measure.

# Q. Are we excluding moss studies?

## A. Yes. Exclude any study that examines the effects of grazers only on the Plantae kingdom.

# Q. Does the study duration correspond to how long they took measures for or how long the exclosures have been established?

## A. How long the measures took place for. The “last.grazed” column, to some degree, captures the length of exclosures established.

# Q. What should we put for grazing frequency when grazer a wild/native grazer (e.g. deer)? More on this, if something is a wild grazer (non domesticated), do we automatically label this as native grazer? What if grazer not native (I don’t think I have the expertise to determine whether some wild grazers are native to an area or not).

## A. Good question! If there are naturally occuring grazers, then the frequency becomes a 3. Any non-domesticated grazer can be labelled as “indigenous” and in that definition we can include anything that is not domesticated.

# Q. Are we including wetland studies? My example looks at cattle grazing effects on wetland invertebrates (terrestrial arthropods)

## A. Another good question! Our study is examining multi-trophic effects. For a wetland or aquatic study to be included, the effect of the grazer must first impact the plants (even if not measured) and then impact the response species, i.e. indirect impacts. This would exclude papers that quantify the impacts of grazer on aquatic systems because of nutrient run-off, dung, etc.

# Q. What if studies look at indirect effects (e.g. measure effects of grazing on visual obstruction-- which is a measure of good habitat for bird nesting, but don’t look at the abundance/survival/performance of birds directly)?

## A. Proxy measures for animals including calls, visual evidence/tracks, or scat, are all acceptable as long as they are quantified with appropriate means, errors, and replication values. The great power of meta-analyses is the ability to compare among different sampling techniques. However, ordinal descriptions, such as Likert scales (e.g. good, medium, poor), often lack proper summary statistics, and tend not to be included.

Q. If the full text of a paper is not available online, but we have access to the abstract, can we decide that the paper is not useable based on the abstract (i.e. no indication of multitrophic data)?

**A. Yes! You can also contact the author if the abstract is insufficient for a copy of the MS.**

Q. How precise do Lat/Long measures need to be? A study has a map of the sampling sites within Alberta, I can go in and approximate the locations

**A. The Lat & Lon can be somewhat imprecise. If a site name is provided, you may be able to check it on Google Maps and then extract the lat, lon values from the URL. If it is on a map and you can confidently identify areas, then extract it that way. Otherwise, if you feel the lat and lon are too imprecise (>100 km error) then ignore.**

# Q. There is a paper here that is relevant, but I cannot figure out what should be extracted. For example, the number of replicates is ambiguous.

## A. There is a column called “Flagged.for.review”. Put a note in there for either Alex or JC to go through and check what the issue is with the paper.