ES 207 Spring 2016 Final Exam

The following information outlines the final exam for ES 207:

1) It is a take-home final, with the deliverable due by Wednesday May 11 at midnight.
2) You should **take no more than three consecutive hours** completing it. In other words, once you sit down and begin the exercise, you have three hours to complete it and turn it in.
3) It is open book / internet, but it is not "open friend".
4) You are encouraged to pull in additional information (e.g., research studies) as necessary to improve the deliverable, but the real gauge of your success is what you produce independently.
5) You are on your honor.

As the up and coming star in the eBird lab you have been given an impossible task: prepare a talk for the lab director, Dr. Busybody. Not only do you not have the time to do this right (as Dr. Busybody needs it in three hours), but also you have been handed some other student's field data from this past summer that has yet to be QA/QC'd (and now that student is in Nepal, or maybe Thailand, but regardless is not responding to your frantic emails despite routinely posting ridiculous elephant pics to Facebook), which means that deciphering the data will be difficult and there could be substantial error in the data (and no way of really knowing its source). Despite all of this, you are comforted by the fact that the presentation to the International Ornithological Union is only 12 minutes long. Doing some rough calculations of 1-1 ½ minutes per slide, you conclude that preparing nine total slides plus speaker notes will keep you in the good graces of Dr. Busybody and not diminish your future with the IOU.

You have been given two files. In the first file, you determine that the summer sampling crew used the "Variable Circle Plot" method developed by the USDA Forest Service and practiced by many IOU scientists[1]. In the second file, you determine that there are coordinates for the sampling locations in the first. Before getting too far ahead of yourself, you decide to make a plan for developing this talk in an efficient and professional manner. One, you outline your nine slides to include a title slide, a study overview slide, a summary slide, and an acknowledgements slide. This leaves only five substantive slides that need real development. You know that many talks show a map of the study site, and you have coordinates, so that could set up the analysis. You also know that the data have common names of bird species and counts, so a ranked histogram of the most common species could set up the analysis even further. This leaves three analytical slides that need to show that Dr. Busybody is no slouch. Before going to much further, you have been thinking that this where the scientific workflow you have learned so much about in that ES207 class comes into play: develop some working hypotheses (e.g., differences in abundance by species, detection type, dates; species richness driven by elevation, vegetation types, etc), outline some potential methods (e.g., t-tests, contingency tables, linear models), and sketch out some visual representations (e.g., histograms, boxplots, scatterplots, etc). Now, the rest seems relatively straightforward: upload the two csv files into RStudio, go to work, and deliver one presentation (MS Powerpoint *.pptx format or RStudio ioSlide HTML printed to *.pdf, etc) with speaker notes uploaded to CatCourses showing your best work (i.e., impress Dr. Busybody with your skills in environmental data analysis and show some intellectual discovery with these data).

[1] http://www.prbo.org/cadc/songbird/pc/pcprot.doc

General pointers on preparing presentations:

1. ***Title Slide***
    a. Have a good title.
    b. Include your name, affiliation, date, venue and contact info (these details come in handy).
2. ***Introduction***
    a. Provide a brief outline and share the main point(s) of the presentation.
        i. and/or foreshadow the logical development of the presentation
        ii. as you continue through the presentation, identify recognizable landmarks so the audience can chart progress
3. ***Body***
    a. Structure intermediate sections to follow the logical development. This should generally follow your scientific workflow.
        i. Each section and sub-section should represent one step of development in a train of thought.
    b. Omit un-necessary information.
4. ***Conclusions***
    a. Conclusions should briefly summarize and reiterate the presentation's key point(s).
    b. For short talks, including conclusions in the intro can be helpful.

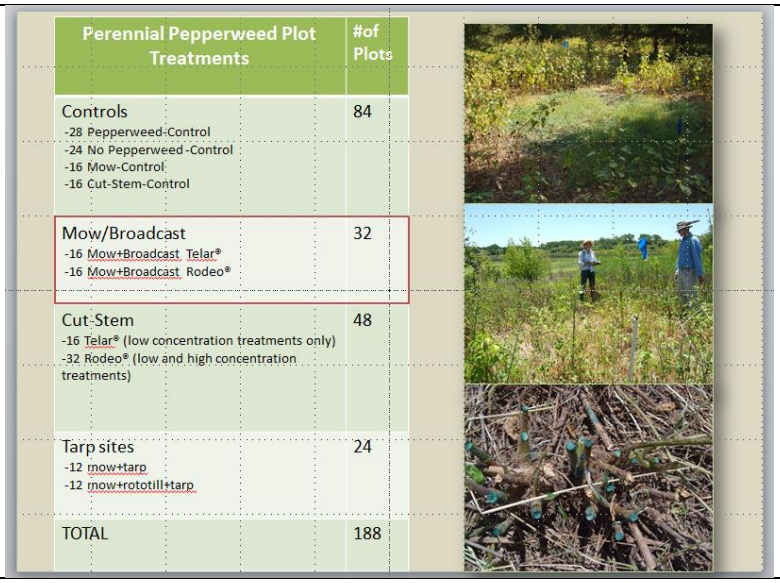
Other details worth noting:

1) There is an art to balancing text detail with brevity and readability.
2) There is an art to providing aesthetic appeal without too much visual distraction.

For how *not* to give a talk, this overview is pretty good:

http://www.casca.ca/ecass/issues/2002-js/features/dirobertis/talk.html

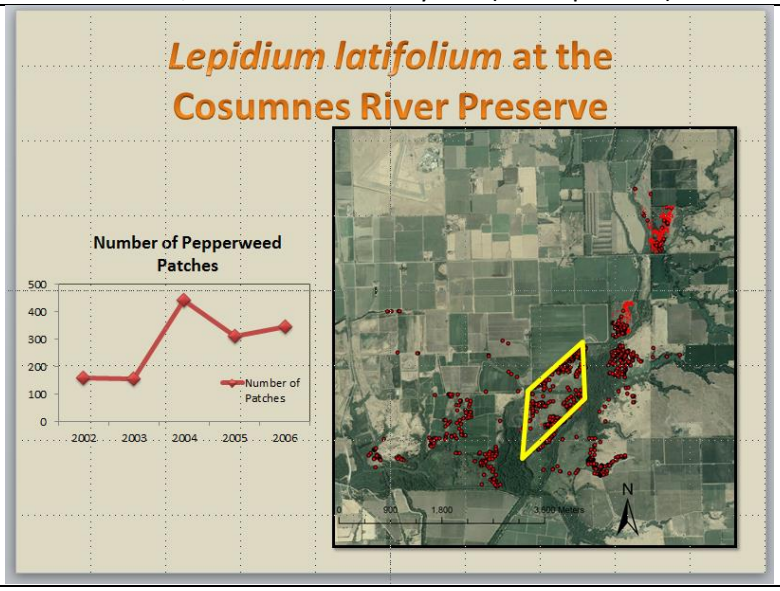
The following are *example* slide / speaker notes that someone (a stand in perhaps) could use to deliver the talk with less difficulty. They are not great, but should give you some idea if you are unfamiliar.



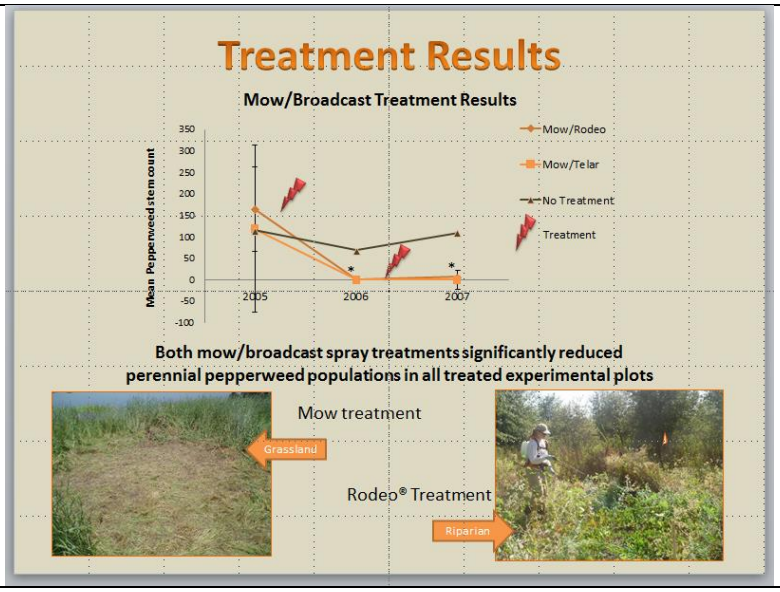
| Perennial Pepperweed Plot Treatments | #of Plots |
|---|---|
| Controls<br>-28 Pepperweed-Control<br>-24 No Pepperweed -Control<br>-16 Mow-Control<br>-16 Cut-Stem-Control | 84 |
| Mow/Broadcast<br>-16 Mow+Broadcast Telar®<br>-16 Mow+Broadcast Rodeo® | 32 |
| Cut-Stem<br>-16 Telar® (low concentration treatments only)<br>-32 Rodeo® (low and high concentration treatments) | 48 |
| Tarp sites<br>-12 mow+tarp<br>-12 mow+rototill+tarp | 24 |
| TOTAL | 188 |



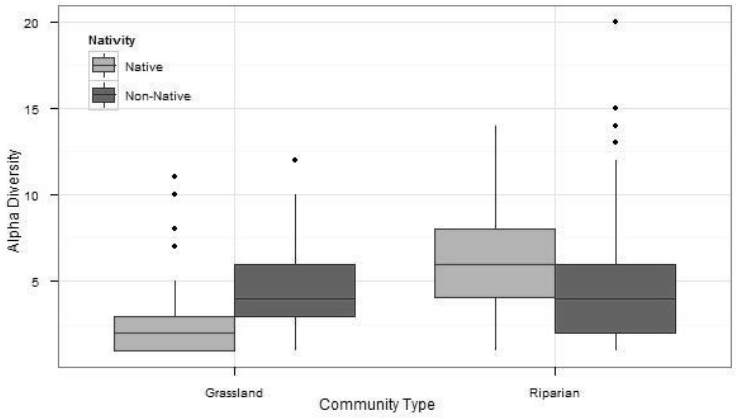
This table shows the experimental design with corresponding photos of treatments. Plots were distributed across two primary environments: floodplains and grasslands, resulting in at least six plot clusters in each environment. In all 188 plots were censused for total stem counts of pepperweed prior to experimental treatments, and for successive years (now up to 7+!)



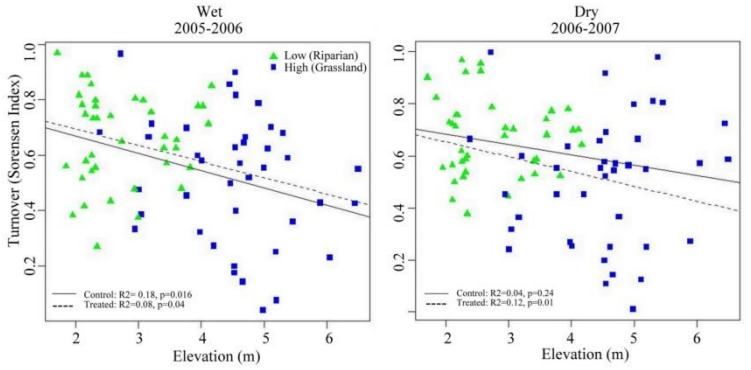

Map of infestation and core (shown in the diamond) area of treatment study. The site is located at the Cosumnes River Preserve is southern Sacramento County and consists of >50000 acres of riparian floodplain and grasslands. Restoration objectives include levee breaching, which may result in unintended infestation of pepperweed.




Graphical results from first three years of experiment. Bottom line: herbicides kill plants. But more detailed looks show differences across species and sites.




Native and non-native species counts (alpha diversity) of non-invaded reference plots in riparian and grassland sites. Native species are more prevalent in riparian areas while non-native species are prevalent in both.




Regression of Soresen Bray-Curtis distance and elevation for control and treated plots over two time steps. Turnover is more pronounced in lower elevation riparian areas in wet years (left) while there is no relationship between elevation and turnover in dry years (right).