**How to start a research project:**

*NOTE: This was initially created for undergraduates, but the general content is also appropriate for early graduate students*

1) READ – and this means active reading. If you read a book or paper – either take notes in the digital PDF or keep a notebook or word file with your notes. Reading a paper without making notes/highlighting is not very useful.

For each paper, make sure you understand:

- What they did, and why

- How it relates to your work

- Where the work took place, and how it might differ from your work.

2) Start using a citation manager (Mendeley is free, but many are available). Use folders and tags to organize papers.

3) Think about processes and mechanisms in your study. Some people do this best with words (writing out hypotheses), others do it better with images (creating a concept map). You may have a vague idea that birds will be more abundant in site x than site y, but why do you think that? Is it insect availability? Adequate habitat? Competition? Each of these highlights an underlying mechanism (and there usually isn’t just one!).

Within your first few weeks on a project, at least try to outline your hypothesis, and I suggest doing this (**see Figure 1 for an example!)**

4) Make a schedule/to-do list/goals list. There are many great ways to do this, so I encourage you to find what works for you. What works for me is to have both short and long term goals. For example, your long term goal might be a research poster 6 months out. To reach that goal, you likely need all the data entered at least 1 month out, and figures made at least 2 weeks out to make sure your supervisor has a chance to review the poster. If you’ve never done the analyses, before, you might move everything back to give yourself “buffer time”. If you haven’t read up on the study species, you should also plan for some time to do that. So a good semester to-do list for a project on camera trap detection of shrikes may look like:

**January**

Conduct google scholar search to determine if any similar studies exist

Read >2 papers about shrikes

Read >2 papers about camera traps

**February**

Enter data (~15 hrs total)

Read more about shrikes

Ask grad student for meeting to talk about occupancy modeling

**Early March**

Finish data entry

Figure out total # shrike detections, and total number of sites where shrikes were detected

Find a couple of good pictures for the poster

Create 3-sentence summary of what we did and why it’s important (this will help with writing introduction)

**Late March**

Create poster template with slots for pictures, figures, and text, ADD INTRO IF IT’S DONE

**First week April**

Intro DONE, insert figures and pictures into poster, draft discussion/conclusions

Send poster to supervisor for review

**Second week April**

Incorporate supervisor comments

Print poster

**Third week April**

Present poster!!!

Additional tips for success:

Try to hone your ability of knowing when to ask for help/instruction. Some people won’t ask for help until they’ve wasted a lot of time or made a mistake. On the other end of the spectrum, others will ask for help before they even try something on their own. Find which direction you tend towards, and work on training yourself to find a better balance. For example, if you realize that you don’t know how to identify a certain species, you shouldn’t immediately ask your supervisor how. A better approach would be to look up the species online, and search for “ID characteristics” – then, once you feel like you might understand, check in with your supervisor to see if you are correct. On the other end, if you realize you need to use a certain statistical test, don’t spend 20 hrs googling it and trying to do it all yourself. Look into it briefly, and if you can’t figure it out on your own after an hr or 2, reach out for help!

Please note, finding this balance is a MOVING TARGET and everyone struggles with it (grad students and faculty included!). You will get better with practice!

FIGURE 1. Ecological model and hypothesis testing, in 5 steps









