Handbook for the Forest Animal Ecology Laboratory

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Welcome

Welcome to the Forest Animal Ecology Laboratory! We are housed in the Department of Forest Engineering, Resources, and Management (FERM) and College of Forestry (CoF) at Oregon State University (OSU). Within FERM, we are located in the Silviculture, Fire, Forest Health, and Biodiversity Area of Concentration (AoC) based on the topical areas covered by our research.

This handbook houses information for members of the Forest Animal Ecology Laboratory (hereafter, the lab) to provide guidance on lab policies and expectations. Although the primary audience for the handbook is new graduate students, **all lab members are expected to read it upon joining the lab, review it annually for updates, and refer to it throughout their tenure**. New graduate students must also read the FERM Advising Guide closely so they understand the policies that are specific to the Sustainable Forest Management (SFM) Program. Note that although this handbook serves as the policy document for the lab, we also have a lab wiki (https://fael.forestry.oregonstate.edu) for lab members to reference with detailed descriptions of the procedures that we use regularly in the course of our work (e.g., purchasing, hiring, renting vehicles).

This handbook benefited from lab handbooks created by colleagues at OSU and beyond, including Mariam Aly, Courtney Conway, Mindy Crandall, Jonathan Peelle, Lauren Ponisio, Maureen Ritchey, Doug Robinson, Catalina Segura, John Thompson, and Leigh Torres. I thank them for openly sharing their handbooks and ideas regarding how to help graduate students prosper in an academic research group.

Types of graduate student positions in the lab

Graduate Teaching Assistantship (GTA). GTAs are funded through OSU and require the graduate student to assist in the delivery of an undergraduate course. The duties of a GTA can vary widely across different courses. For example, a GTA may teach a section of a lab-based course, run a discussion section, and/or grade for a lecture-based course. Being successful in a GTA position requires partitioning time for teaching duties, in addition to taking courses and conducting graduate research.

Graduate Research Assistantship (GRA). GRAs differ from GTAs in that graduate students are paid to assist in undertaking research, as opposed to assisting in teaching. GRA support comes from funded research proposals with specific project deliverables; these typically include datasets, presentations, and publications. Receiving GRA support requires that the student conducts work as outlined in the grant and often – but not always – that work is aligned with the student's thesis or dissertation research.

Graduate Fellowship. Fellowships are not considered to be employment-based positions by OSU; instead, they are categorized as awards and are granted in a manner that is similar to an undergraduate stipend. Fellowships can come from an outside source (e.g., NSF Graduate Research Fellowship) or internally from OSU (e.g., the Graduate School, College of Forestry, FERM Department).

GRA and GTA duties are determined for each term and on an individual basis. If a student is being paid as a GTA or as a GRA, my expectation is that they will be working during university breaks (except for staff holidays) as outlined by their GTA/GRA appointment. Regardless of the type of position a graduate student has in the lab, it is critical to note that "work" towards a student's thesis or dissertation research –including such things as proposal writing, data collection, thesis writing, among others – is not considered employment or "work" by OSU and thus is not compensated. Nevertheless, such activities are critical for making academic progress and must occur in conjunction with academic coursework.

My approach to advising graduate students

No two students are exactly the same

Experience has taught me that students differ from each another in many ways – their backgrounds, experience, skillsets, and career goals, to name just a few. Therefore, I tailor my advising approach to each student, which begins when a student first joins the lab. Starting early helps me to understand how I can help students attain the goals they set for themselves during their time in the lab so they have the skillsets they need to obtain a position of their choosing once they leave OSU. Given students differ in many ways, striving for equity in our group means that not all students will have the exact same experience, although they will have similar opportunities while in the lab.

Students are expected to lead their graduate work

I strive to work with students who are self-directed and empowered to lead their work, as this helps students to develop project management expertise, a skillset that is critical to success in the field of natural resources. This can be challenging for some students, especially those who are new to graduate school, because it requires a degree of independence that some students may have not yet experienced. That's OK, however, because that is where a lot of professional growth can occur. Thus, I don't expect my students to go through this process on their own, but I do expect them to be leaders and advocates for their work without prompting from me.

Graduate students have financial support for a reasonable amount of time

In nearly all cases I do not agree to take on a graduate student advisee unless I can provide funding assurance that allows them to complete their degree requirements in a reasonable amount of time. Although it can vary, this typically means 2 years for a M.S. student and 3-4 years for a Ph.D. student, as obtaining additional support beyond these program norms can be difficult to obtain. Support that I typically provide to students comes in the form of either a graduate research assistantship (GRA) or a graduate teaching assistantship (GTA), and it is common for students to have a combination of GRA and GTA support during their degree program. Because the amount of GRA and GTA funding is finite and limits how many students the lab can support at any one time, graduate students are expected to make good, regular progress to maintain financial support and continue their work in the lab.

Graduate students benefit from professional engagement

Professional scientific conferences are a great opportunity for students to share their research findings and network with colleagues and future employers, so I encourage my students to attend scientific conferences when time and resources allow. On some projects, we are fortunate to have funding that helps defray the costs of attending conferences for students who are giving a presentation on research they conducted within the lab. Nevertheless, conferences can be very expensive to attend (>$2000/person), so I expect my students to spend conference funding wisely and/or seek additional funding to help defray the costs of conference attendance, which includes taking the lead on drafting and submitting funding applications. If students are unable to secure funding for attending a conference that is crucial for their work, they should reach out to me and we'll work together to see if we can figure out a plan that would allow them to attend.

Constructive feedback is critical for developing scientists

One of the tenets of my advising philosophy is to provide my students with constructive feedback on their work, starting with the development of a research proposal and extending all the way to the final edits of manuscripts submitted for publication. This means that there are typically multiple drafts to review, whether it is on a research proposal, a thesis chapter, or a presentation. Although there is no

one single way to write a paper or give a presentation, the feedback I provide is based on my experience conducting research over many years and it is given in the spirit of improving the science and, more broadly, helping students to enhance their development as scientists. Therefore, my expectation is that students take my feedback and consider it critically to understand how it may improve their work. Although I provide feedback large and small, my expectation is that students should follow my advice on large, must-have changes – unless they can provide me with a well-articulated reason not to do so – yet take leadership on their work and decide on which finer-scale edits are necessary. It is also critically important that students recognize the motivation for constructive feedback, and that my comments are not about any flaws individuals might perceive they have. Instead, constructive criticism is a key part of a scientific career, and being able to receive and make use of such feedback to improve one's work is a critical skillset to have for success in science.

Students benefit greatly from peer learning

Despite the importance of constructive feedback from me, the idea of learning exclusively from a graduate advisor is an outdated model. Instead, there are significant benefits that students obtain from having regular interactions with other members of the lab, as well as colleagues in our department, our college, our university, and our research field. Although advisors have more experience than graduate peers, graduate peers can serve as sounding boards and informal teachers on a wide range of topics, from which courses to take (or avoid!) in graduate school to providing training needed to master advanced quantitative skills. Thus, it is critical for students to recognize the value of peer learning and to tap into this important network as both a receiver from and a provider to their peers. Doing so provides a huge boost to a student's development as a scientist, and it provides an opportunity to develop personal and professional relationships that can last a lifetime.

There are lots of things to balance in graduate school

Graduate school often marks a special time in one's career; it is a period of extensive, deep learning to become a subject matter expert and to develop a range of skillsets that will be used throughout one's career. It can also be a stressful time due to uncertainty about the future, a relatively short time for completing graduate degree requirements, and because one's personal life often vies for attention with the long hours needed for success in graduate school. I recognize this, and I encourage my students to make sure they are taking care of their physical, mental, and emotional needs as they progress through their graduate program. I also ask students to let me know when they are having challenges in their lives, both work and personal. It is important to note this does not mean that I need to know about the details of what is impacting a student's personal life; however, I do need to be informed if there are personal challenges that will require me to adjust my expectations for a student who is being impacted.

Characteristics of successful graduate students in the lab

Good communicator

Clear and regular communication with me is critical for a student's success in the lab. Although I expect my students to lead their graduate work, as the lab PI I am ultimately responsible for making sure that everyone in the lab delivers on the research products that we are contractually obligated to produce such as presentations, reports, and publications. That means it is critical that I stay informed about progress – or lack thereof – on research projects that are undertaken in the lab. Experience has shown that regular communication allows me to stay informed of my students' successes and struggles with their work, and it allows me to help them attain the short- and long-term goals they have set for themselves. Ultimately, this helps students to make sure they are on task, making progress with their degree requirements, and using their time effectively while they are in the lab.

Task-oriented with follow-through

As anyone who has undertaken field work in the field of natural resources can attest, conducting research is not a 9-5 job but instead requires a task-oriented approach. Graduate school is no different, as much of the work that graduate students undertake is not easily packed into a neat, regular schedule. Instead, graduate work occurs across days, months, and even years. At the same time, having follow-through on tasks is equally important to make sure that work is done well and completed in a timely manner. Graduate school is a time when many important tasks have a long future payoff and require many intermediate steps (e.g., submitting a manuscript to a scientific journal), so being task-oriented with having follow-through is critical for success in graduate school. Science is not easy, many tasks in graduate school are challenging, and distractions abound when work becomes challenging; thus, it is critical for students to stay on task despite all of the potential detractors to their success.

Self-directed problem solver

At any given time, the lab is likely to have at least a half-dozen active research projects that are at various stages of completion, with additional projects under development. As the PI, this requires me to develop novel research, pursue funding, recruit new lab members, and complete research obligations. At the same time, I teach several undergraduate courses every year, provide service to OSU and my profession, and have important family obligations. Because of these constraints on my time, students in my group must be self-directed, advocate for themselves, and lead their work without prompting from me. This means being a leader for their graduate research by being proactive and taking the initiative, such as scheduling regular meetings with me, communicating regularly (even when they are busy), and following through on expectations and commitments. This is not to say that I expect students to operate completely independently, but I do expect the motivation for completing graduate work comes from students and that they pull me along with them (as opposed to me having to push them to make progress). At the same time, I also expect my students to be good problem solvers and work at solving problems on their own and, when they get stuck, figure out who is best positioned to help them. In many cases, lab members share a wealth of knowledge that can – and should – be tapped into to help with routine problems that arise. Typically, someone in the lab besides me will be able to provide input and can help resolve a problem. If no one in the lab knows the answer and it is not a time-sensitive issue, then it should be brought up during one of our regular meetings. See p. 12 for a flow chart for how students are expected to proceed when going about getting their questions answered.

Scientifically curious

Science is all about discovering how the world works, so students who are scientifically curious with broad interests will have the most success in the lab. Part of this is because a well-known benefit of being curious beyond one's field of research is that broad thinking can provide novel insights that arise from approaches used in other areas of study. The other reason is that the topics we investigate in the lab are broad, covering basic and applied questions across a number of study systems and taxa. Thus, lab members that are scientifically curious and think broadly – or are willing to do the work to develop and hone this approach – have greater potential to adopt insights from outside their research focus that benefits their work, as well as helping them to develop and hone the critical thinking skills that are crucial for success in a scientific career.

Field-tested

Nearly all of the research we do in the lab requires graduate students to arrive in the lab having already obtained sufficient field experience that allows them to be successful when undertaking their graduate research. Field work is different from other forms of work in myriad ways, and thus there is no

substitute for real-world field experience. Skills needed for field work can vary widely in their degree of specialization; some require extensive training (e.g., mist-netting) whereas others can be learned rather quickly (e.g., radio telemetry). Because I expect my graduate students to lead their field research, it means they need to arrive at the lab having already developed the specialized skillsets required for collecting field data in the course of their graduate program, and they need to be able to learn the less specialized skillsets they can be learned quickly that they may lack. This is important as there isn't enough time to learn specialized field skills during graduate school because a student's time is already dominated by graduate coursework, serving as a GTA/GRA, becoming a subject matter expert, and developing and executing research. Thus, students must have – or be able to quickly gain – the skillsets that are critical for successful field work as it pertains to their graduate program.

Resilient against setbacks

Earning a graduate degree has been likened to running a marathon because it plays out over a long period and takes a large amount of mental and physical energy. That means there will be highs and lows during the process, times of frustration and doubt, and even periods where students may ask themselves whether going to graduate school was a good decision. Compounding these challenges, rejection is a large and regular part of undertaking science, and it takes time to develop the "thick skin" that is needed for a scientific career. Thus, students who understand that constructive criticism, rejection, and failure are an inherent part of science – and are willing to learn ways that help them become resilient to these forces – are those that will have the most success in the lab and in graduate school.

Kind and thoughtful

Too often in high-pressure work environments, such as graduate school, individuals focus on their own needs and fail to take the time to consider how their actions affect others around them. Therefore, it is important that lab members are mindful of their actions and work to act kindly towards others. This can take many forms, such as taking care to recognize and acknowledge the contributions of other lab members or collaborators, or being willing to assist a peer in need of help. Being kind and thoughtful helps to support a friendly, mutually support environment and allows all lab members to do their best work.

My expectations for graduate students in the lab

Provide regular updates

With as big of a group as we have in the lab, it can be challenging for me to keep track of where all of my students are with their work. Therefore, having regular 1-on-1 meetings with my advisees provides me with an opportunity to discuss each student's progress and the challenges they may be facing. The frequency of these meetings varies depending on several factors that can include the person's time in the lab, our workloads, and the time of the year, among other things. It is typical for me to meet more often with graduate students when at the start of their program and when they are getting close to wrapping up, with longer intervals between meetings once students are up and running. I usually hold regular meetings in fall and winter terms, with meetings during spring term and over the summer being semi-regular because of the field work obligations that many of us have. Given the importance of regular communication, I expect that my students will take the initiative to set up a regular time prior to the start of each fall, winter, and spring term and before starting field work. Even though field work is

very time-demanding, I still expect my students to provide regular updates when they are in the field so I'm kept aware of how their work is proceeding.

For regular advisee meetings, students are expected to follow the lab-specific format that is detailed in Appendix 1. Briefly, at least 2 days prior to our scheduled meeting the student sends me a summary email that highlights their accomplishments since our last meeting, outlines the issues they are facing, and lists their planned work for after our meeting. Because of my schedule, I reserve the right to cancel the meeting if I do not receive the agenda at least 2 days prior to our scheduled meeting time to have adequate time to brainstorm solutions to their issues. During our meeting students should take notes on the items we discuss and then email me a brief summary of their notes within 1 day of our meeting for me to review. Experience has shown me that this approach gives me time to consider each student's questions and make the most of our time together; it also makes sure that the student and I are on the same page with respect to any important decisions that were made during our meeting. If students need input on something that can't wait until a regular scheduled meeting, they can always stop by my office or send me an email. If they have something that is time-sensitive, they can send a text (preferred) or give me a call on my mobile phone; they should not email if something is time-sensitive because I do not keep work email on my mobile phone.

Keep a regular work schedule

Graduate school is different from most other jobs, but nevertheless it is still a job and should be approached as such. Because graduate school often has large periods of unstructured time, it is critical for students to be organized and establish a regular work schedule. Although students vary in terms of when they are most productive, my expectation is that students are available during regular working hours (9am-5pm, Monday-Friday) in the event I need to get in touch with them on short notice. I also expect that students spend the majority of their time working on campus during fall, winter, and spring terms because there are many benefits that are provided when students are working together in a shared work setting. As noted above, peer-to-peer learning is a large part of one's growth as a scientist in graduate school, so being physically present in the environment of a lab group is important to facilitate that process. In terms of taking extended time off/vacations, everyone needs a break from work to recharge and replenish, but there are periods when taking time off is impractical, such as during the field season. Thus, extended time off should be discussed with me and approved well ahead of time, with a follow-up email sent to me by the student that summarizes our discussion so I have it for reference. As noted above, if a student is being paid as a GTA or as a GRA, my expectation is that they will be working during university breaks (except for staff holidays) as outlined by their GTA/GRA appointment.

Manage time efficiently

Graduate school goes fast, and that means students must be efficient at managing their time if they are going to complete their degree in a timely manner and within their funding timeline. In general, I expect M.S. students to have 2 publishable research-based chapters for their thesis and that Ph.D. students to have at least 3 publishable research-based chapters for their dissertation; note this is in addition to one short introduction chapter and one short summary chapter for each thesis/dissertation. To accomplish this, students must stay on task to make the most of their time in the lab, hit key milestones, and keep up momentum. To do otherwise reduces opportunities for other deserving folks to join the lab and may lead to concerns about a student's ability to be efficient with their time in post-lab positions.

An important step that has proven useful to help students manage their time effectively is for them to create a schedule for their entire graduate program when they start in the lab. This important aspect of

work planning and goal setting transcends graduate school, and it serves as a useful reminder of where students should be at any point in their graduate program. Working backwards at the start of their program also helps students to consider all of the nuances required to finish their degree and meet deadlines ahead of time. One truism of graduate school is that everything takes more time than expected, especially data analysis and manuscript writing, so it's helpful for students to develop realistic estimates of how long those components will take from the start of their program; a good rule of thumb is everything will take 2x as long as expected when done for the first time. In addition to making a schedule, getting degree requirements (e.g., courses, exams) completed early in their program helps students to stay on track and frees up time towards the end of their program for tasks that take extra time, such as data analysis and manuscript writing. This also allows students to have flexibility in when they finish their program that can be helpful for obtaining positions, especially for those that may come up unexpectedly. It is important to note that graduate students should not plan on taking classes during the term(s) they will be collecting field data, which is typically spring term for most students in the lab.

The following are major steps in a graduate student's program and when they should generally occur:

- Schedule out milestones across entire graduate program (by end of 1st term)
- Assembly of graduate committee (by end of 1st year)
- Approval of program of study (by end of 1st year)
- Write and present research proposal (by end of 5th [M.S.] or 6th term [Ph.D.], including summer)
- Written and oral preliminary exams (by end of 2nd year; Ph.D. students only)
- Final draft of thesis/dissertation distributed to committee (at least 2 weeks before defense)
- Final defense

Become a subject matter expert

Having a solid understanding of the research that has been conducted in one's field of study is critical for success in graduate school and beyond. Although students aren't expected to become an expert in every single aspect of the fields their work touches upon, they do need to develop an advanced understanding of the main topical areas that are central to their graduate research. This is best achieved by developing a digital reference library, reading the literature in the field (including older, foundational work), and taking good notes when they read papers. Science is an iterative process that proceeds one study at a time, so a deep understanding of one's subject matter is critical for identifying contemporary knowledge gaps, articulating why a student's graduate research is important and timely, and understanding how a student's research fits into the broader body of work being undertaken in the field. In addition to using tools that help identify past published work (e.g., Google Scholar, Web of Science), it is critical that students keep up on new literature by signing for automated alerts that flag new publications of interest, such as Google Scholar alerts and the electronic Table of Contents (eToC) alerts that nearly all journals provide.

Develop a research proposal and present it publicly

Towards the end of the first year (M.S.) or the middle of the second year (Ph.D.), students should have drafted a research proposal that provides a concise literature review, introduces the knowledge gap(s) in their field, the hypotheses and associated predictions they plan to test, and the methods they will employ to collect their data. Students are also expected to give a public presentation that summarizes their proposed work with the goal of getting feedback on their ideas. This is a critical step that helps to make sure the proposed work is as strong as possible while also providing an opportunity for students to hone their public speaking skills. Students should plan on giving a succinct public presentation of ~30 minutes, and have it be followed by a closed-door discussion with their graduate committee.

Take courses that support graduate research and future goals
By the time they finish their degree, I expect my students to display fundamental knowledge regarding animal ecology, forest management, and statistical analysis, in addition to other topical areas that are important for their graduate research. Fortunately, we have a lot of flexibility in coursework in our AoC, so the courses that students take should be tailored to their graduate research topic(s) and future goals. For most students, this means a focus on quantitative courses (e.g., statistics, GIS) while avoiding lecture courses, as the latter is often an inefficient method of learning new material.

Be an active participant in the lab
A lab is only as strong as its individual members, and I expect all students to participate in regular lab activities – including weekly lab meetings – and be supportive of their fellow lab members. Lab meetings are important because they offer a chance to get to know what lab members work on while provide feedback on their work, so regular attendance is critical for the success of everyone in the lab. An additional expectation is that all students document the routine procedures they regularly undertake in the lab that are likely to benefit others via the lab wiki (https://fael.forestry.oregonstate.edu). This includes such routine things as making purchases, hiring technicians, rental vehicles, and submitting conference abstracts, among others. Thus, I expect to students to either (1) create a new wiki page for a new procedure that is not currently documented or (2) update a documented procedure as new information is learned. Such documentation not only saves time for everyone in the lab, but it also provides a way of having continuity in how we undertake routine tasks in the lab given the relatively short period most graduate students are in the lab. Having an updated wiki is also of critical importance in helping new lab members get up to speed quickly on the procedures that are critical to how the lab operates.

Follow-through on research obligations
Even if students don't plan to go on to research positions after they leave the lab, I do expect them to follow through on their research obligations. In almost all cases that means publishing their graduate research in peer-refereed publications to disseminate findings to other scientists, which is also crucial for fulfilling grant obligations and ensuring the continuity of funding to the lab. Academic publishing is a long process that requires follow-through that, for nearly all students, extends past their defense date. This means that most students will have papers and/or data that are unpublished by the time they leave the lab. Although my hope is that students will continue to put some of their time towards preparing publications after they leave, I recognize that is not always possible or even desirable for some students. In those cases, it is critical that students leave their thesis/dissertation files organized in a manner that their work can be published by the lab. Given the importance of publishing, it is also important that students discuss their level of interest in publishing their findings early in their graduate program, and that they take the steps necessary to ensure that their findings can be shared via scientific journals, even if they aren't involved with the publication of the work they lead.

To facilitate follow-through on projects, students are expected to keep files related to their graduate project in a well-organized folder on Box that I create, as being the owner allows me to maintain ownership and continuity of files after students leave the lab. Folders should be organized in an intuitive manner so that I can find files efficiently and they should contain, at a minimum, subfolders that contain files related to proposals, data collection protocols, datasets and statistical code, presentations, and manuscripts; a sample folder is shown in the lab wiki. It should go without saying that project files should be backed up regularly to avoid catastrophic data loss. Finally, it is important to note that data from funded projects are not owned by students or by me, but instead they are owned by OSU and

managed by the lab because the university is the body that ultimately receives the research funding. Most funding agencies require data to be managed in a way that they can be leveraged by other researchers in the future, which serves as another way to follow-through on research obligations. Thus, one of the most important things that a graduate student can do is to ensure that the data they collect is collected and stored in a manner that fulfills grant requirements and is stored in a manner that allows it to be used by other scientists.

Get research products approved before sharing them outside the lab

In general, I will serve as the senior author (i.e., last author on the authorship line) on the research products that stem from research that is undertaken in the lab – including presentations, reports, and manuscripts, among others – unless we have discussed something separately. Serving as the senior author is a recognition of the role that I have played in contributing to the intellectual development of the research, obtaining funding, undertaking project administration duties, and being involved with the writing and/or editing process. Students should use my full name (James W. Rivers) when adding me as an author for continuity. Importantly, all research products should be approved by me before they are shared outside of the lab group, with adequate lead time for me to review them; this includes conference abstracts, manuscripts, and presentations, including those being shared with members of graduate committees. If there are additional co-authors, they should also have adequate time to review and provide feedback. What constitutes adequate time depends on the extent of the material being reviewed, but in general should be at least 1 week for smaller items (e.g., conference abstracts) and at least 2 weeks for larger items (e.g., refereed manuscripts). For oral presentations, students should plan to go over their presentation at least 1 week in advance to have adequate time to incorporate feedback.

Key things to know when starting in the lab

The following is a general description regarding things to know when starting in the lab. Note the lab wiki has the details of the regular procedures of the lab, so be sure to consult it as well.

Office, lab, and storage space

Students must be in OSU's system before they can get an ID card or obtain keys to labs and offices. Thus, it is critical that students get their paperwork taken care of as soon as possible. Our group currently shares lab space in 269 Peavy Forest Science Center (PFSC) with several other PIs. The 3 main PIs in the lab have divided up the lab such that the dedicated long-term space for our lab members is the stand-alone middle lab bench. Thus, we need restrict our use to the center lab bench for longer term projects, with the side benches serving as shared space among all lab groups and available for shorter term use.

We have several locations where research gear is stored; these include the Mouse House (shared space with the Betts lab), a portable storage container near the Mouse House (the "MAMUnit"), and a locker at the Oak Creek Barn, all of which are in the vicinity of the Oak Creek Building close to the corner of SW 30th Street and SW Western Boulevard. We also have limited storage space in our shared lab in PFSC 269 and in a research cage in the basement of Peavy Forest Science Center (PFSC 014). Finally, we have -20°C and -80°C freezers located in one of the side rooms in PFSC 006 for storage of samples and specimens.

Research permits

Lab members work as subpermittees under my research permits, which include those issued by OSU, state and federal agencies, and private landowners. If students are working with vertebrates for their research, there is additional (and extensive) training required by the OSU Institutional Animal Care and Use Committee (IACUC). Working as a subpermittee on my permits requires that students undertake all training requirements, adhere to all permit conditions, ensure that anyone working under their direction does the same, and provide me with information needed for annual reporting requirements. Keep in mind that permitting bodies are widely variable in the amount of time they take to create or amend a permit for a new project, so be sure to plan out what is needed for permits well ahead of time so that there isn't a time crunch close to the start of the field season.

Required readings for new graduate students

The lab wiki has links to required readings for new students to make sure they get off to a strong start in graduate school. Many of these are reading multiple times to glean all the valuable information in them.

Getting questions answered

This handbook is just a starting point, and new graduate students will have many more questions that can be covered in a handbook; some of those will be specific to OSU/CoF/FERM/FAEL, and some will be broader in nature. To find answers to their questions, students should use a scientific approach and tap into the knowledge networks they have access to, as noted above. Below is a recommended decision tree that students should use for getting their questions answered:

1. Check the lab handbook.
2. Check the lab wiki. → if it's not in the lab wiki, please update the wiki with new info!
3. Check with a graduate student in the lab.
4. Check with Google.
5. Check with other members of the College of Forestry community (e.g., grad students).
6. Check with me during one of our 1-on-1 advising meetings.

Appendix 1. Required format for 1-on-1 advisee meetings

Experience has shown that having short, regularly scheduled meetings are useful for several reasons:

1. It provides regular opportunities for students to discuss their work, the progress they are making, and the hurdles they may be encountering.

2. It provides students with accountability and structure that helps make regular forward progress, which is especially helpful for complex tasks with deadlines out on the horizon.

3. It helps me learn where progress is (and is not) being made so that I can provide timely input.

STEP 1. At least 2 days before our meeting, email me a bulleted agenda that covers the following questions, along with an estimate for how much time we will spend on each topic during our meeting. Be sure to put this in the body of an email, and not as an attachment.

1. What have you accomplished since our last meeting?
2. What questions/issues do you have that require my input?
3. What do you plan to accomplish prior to our next meeting?

STEP 2. Take notes during our meeting to have an ongoing record of what we have discussed. This gives us an opportunity to quickly go back through past conversations if we need to.

STEP 3. Within 1 day of our meeting, send me a follow-up email with the meeting notes that were taken, making sure to highlight the items that require action from me (red text or highlighting work well). As in step 1, be sure to put this in the body of an email, and not as an attachment. This is important because it helps to make sure that we are on the same page with what we discussed the next steps to be taken.

STEP 4. I will look over the follow-up email and either confirm that we're on the same page or I will provide any clarifications that are needed.

Sample meeting agenda

Meeting Agenda for December 1, 2023 at 3pm

1. Accomplishments since our last meeting
    a. Presented FWHMF talk
    b. Revised intro and discussion of *Oikos* paper

2. Questions/issues that require input
    a. Confused about slope estimates for burn severity paper
    b. Need to decide vendor for *Osmia* cocoons

3. What will be accomplished before our next meeting
    a. Meet with Ariel to double-check stats and adjust paper accordingly
    b. Submit our revised paper to Oikos by the end of the year
    c. Email BLM contacts to see if they want to join us for a field visit

Sample meeting notes

Notes from 22 May 2023 meeting at 11:00 -- Action items for Jim are in red

PART 1: FPH Project

- Discussed *Osmia aglaia* (I also talked with JC about this topic today, so I'm including info from him here)
    - Going to set out cocoons in a subset (10-20) of stands this year and see how it goes
    - Should get them out by mid-June
    - It is not possible to predict sex of cocoons based on size like with *lignaria* (JC's best estimate was only 70% correct based on location in the tubes and size)
- The crew is in the lab Friday.
    - They will be taking turns entering data or pinning/ID'ing specimens throughout the day.
    - We will also set out some BVTs/pan traps and go through the protocol together.
    - Will you be joining us for anything on Friday?
- Next week, we are running passive trapping.
- I am going to check with Dionne about Milda to make sure that she really is okay in the field
- We need to set dates for paper discussion/beers with the crew! Let me know what you think of the following dates/topics:
    - Discussion #1: Friday, June 8th
    - Discussion #2: Thursday, July 19th (I know you are gone this day, but we will only be in Corvallis on the same day for 3 days in July!)
    - Discussion #3: Friday, August 17th

PART 2: URSA students

- We are meeting with Kendra and Nicole at 4pm on Friday
- Nicole is working on pollen processing.
    - Andy has some updated slides that we want to get his input on
- Two nests/block have officially been processed for pollen (frass stored, not made into slides yet) and survival. We also froze 5 additional nests/block in case we need additional information. Extra nests were distributed among friends and colleagues. I gave a bunch to Andony.

Signature page

Please write your name and sign below to indicate you have read the handbook, understand its content, and agree to follow the policies that it outlines.

Date	**Printed name**	**Signature**