

PRACTICING ECOLOGY IN NOVEL ECOSYSTEMS

SHARING LESSONS LEARNED FROM URBAN FIELD WORK ON PRIVATE PROPERTY

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INTRODUCTION

Research taking place on private property is essential to the future of urban ecology. However, much of what we know about urban ecosystems is based on remotely sensed data (e.g. [1], [2] [3]), or public parks (e.g. [4]). When researchers have looked at private property on the ground, they frequently limit their study to publicly viewable front yards on single family residential property (e.g. [5]), despite research showing that front and back yards differ [6]. Other types of private property, including multi-family residential, commercial, and industrial, lack representation in the literature.

This gap is particularly problematic for urban ecology research addressing ecosystem function and processes. Most of the land management decisions that impact ecosystem function and processes are made at the parcel level, and most of the land in urban systems is in private ownership—but this is precisely where we are most blind.

Performing more urban ecology research on private property is the best way to address this gap in our knowledge. Many ecologists avoid working on private property because of the additional complications involved [7]. This workshop was put together to address these concerns. The workshop's goal is to provide suggestions and lessons learned for ecologists considering conducting urban ecology research on private property. The workshop is aimed at urban ecologists who have research questions about private property but are unsure or hesitant about how to practically approach private property research.

KEY POINTS

This workshop covers three key points for managing urban ecology research on private property. They are:

1. The need to adapt your research (particularly sampling and research design) to the reality of working on private property;
2. The importance of communication with property owners from first contact (for permission) to post-data collection; and
3. That every researcher on private property will run into problems at some point. The researcher should anticipate issues and adapt when they occur.

The selection of these three points is based on personal experience and discussions with other researchers that have successfully completed private property research.

Please note that this workshop does not address certain topics because they are outside the scope and/or good information is available elsewhere. These topics include:

1. How to come up with a good research question.
2. Survey design. Many guides for designing surveys already exist; e.g. [8], [9].
3. Citizen science and volunteer management. While these approaches overlap, other resources exist; e.g. [10], [11].
4. Rural private property, including farm and forest plots. Research in these areas use many of the same approaches, but they have their own unique problems.

DISCUSSION QUESTIONS

Here are some questions about your private property research to think about during the workshop:

1. What type of research questions are you trying to address?
2. What do you want to learn from this workshop?
3. What problems do you foresee or have you encountered? (e.g. What methods might you not be able to use? Potential hazards in data collection? Potential issues with sampling design?)
4. What do you think you'll be able to apply to your own work?
5. What is the most interesting or important thing you've learned?

DIAGRAM OF PROCESS



BACKGROUND

In urban areas, private property ownership is fragmented both in space (multiple owners/managers over spatial gradients) and in time (property turnover to new owners or managers). This is the underlying reason why so little private property research is done in urban areas at the parcel scale [7].

In the United States, there are four broad types of urban property management: public, private single-family residential owner-occupied, private single-family residential renter-occupied, and private point-of-contact for multifamily residential/commercial/industrial properties. This last category includes property management either by the property owner or by a third party management company (e.g. CBRE). This framework forms the foundation of interacting with private property in urban areas.

RESEARCH DESIGN

Working on private property imposes limits on research study design. Specifically, it limits the use of research methods that are invasive or those that may result in liability for the researcher or property owner. You must structure your questions and methods appropriately to account for these limitations.

For example, in my own research I chose not to core trees to determine their age. I made this decision based on the difficulty of explaining to property owners why coring their trees was necessary and the potential for injury to the tree or being blamed for any problem with that tree later on, regardless of the true cause [12]. Other researchers I have spoken with have tackled this issue by taking only one core where they would usually take two. Other examples of risky research methods include soil metals analysis (finding lead and other heavy metals may lead to property owner liability) and any method involving digging (irrigation systems can and have been damaged by researchers and are costly to fix).

You should also determine if you need human subjects review (e.g. via an institutional review board, ethical review board, or research ethics board) and any local nuances to private property access (e.g. right to roam).

SAMPLING DESIGN

You need to account for rejections in their sampling design where accessing private property requires permission.

There are two main approaches: mail enough requests to ensure n are accepted, or continue mailing rounds of requests until reaching n . With the prior approach, there should be a protocol in place for site selection if the number of acceptances is greater than n prior to sending access requests. Researchers using either technique frequently generate a list of potential sites larger than their target n with the proper sample characteristics (proportion of land uses, ownership, etc.). The goal should be to end up with an unbiased set of sample sites (in terms of their characteristics) that will effectively address the research questions.

MAILINGS/CONTACT

The most common approach to request property access is to send mail to the physical address associated with the property or with the property tax bill. For homeowners, these addresses are usually the same. Commercial and industrial sites are usually managed by agents employed by the property owner. For these land uses, the address associated with the property tax bill is more likely to elicit a response. In the United States, both of these addresses are accessible with publicly available tax assessor's data (note: non-commercial use only). One frequently used mailing protocol is the Dillman approach [13].

Alternative approaches for requesting property access include contacting property owners or managers by phone or in person. In person approaches may be particularly risky in some contexts. In the United States, researchers have been threatened in exurban areas where private property defense and gun ownership are common. Conversely, researchers in other countries and contexts (e.g. approaching businesses instead of homeowners, more urban residential settings) have had no issues with in person requests for property access.

Regardless of the method used, you should look for differences between property access acceptances and rejections as there may be a consistent trend that could bias your results. For example, homeowners may be biased towards accepting your request based on their environmental leaning, interest in gardening, level of education, socioeconomic status, and their relationship with your institution (e.g. prestige and reputation of the university). For commercial properties, some management companies have a blanket 'no access' policy and may manage their property differently.

ACCEPTANCES AND NEGOTIATIONS

Once you've started to receive acceptances, you may find that some property owners or managers attach conditions for access.

Some owners or managers may require you to sign a waiver of liability, particularly on commercial property. You should read these and other documents carefully. You may need to get legal counsel or decline property access if the requirements are too onerous.

On commercial properties, the property owners or manager may also require you to sign in with security or the front desk before and after conducting your research.

Some properties also require advance notice of research visits. For commercial properties, 24 to 72 hours' notice is standard. Even when it is not required, it is polite and highly recommended to communicate with the owner or manager prior to visiting their property (via email or phone). For residential properties, this may require setting up appointments with the homeowners. This does cause issues with weather dependent studies (e.g. bird observations) but is possible with the aid of modern forecasting tools and flexibility of rescheduling for unexpected weather.

These requirements may create bias in your results. For example, I had some sites that preferred weekend visits and one site that required weekday visits. If patterns in your study animals are sensitive to day of the week, this could be an issue. However, this is simply one of the challenges of working on private property, and needs to be adapted to as best as possible.

ONGOING RELATIONSHIP MANAGEMENT

For multi-visit or -year studies, you need to maintain cordial relationships with property owners or managers in order to ensure continued access to their research sites. This means that you must continue to execute on the property owner/manager's rules and requirements agreed to at the start of the process, as well as any additional conditions added later. If you do not, you may risk legal implications and make it harder for other researchers in the future.

The most important thing for you to keep in mind is that there will be year to year turnover in both property owners and managers. For residential properties, some of your homes may get sold. For commercial properties, some properties will be sold to new owners. There may also be turnover in property managers, who are your primary point of contact. This is entirely out of your control, but it will happen and an important part of managing a multi-year research project will be maintaining and fostering new relationships when necessary.

When properties are sold, you will need to re-negotiate with the new owner for continued access. This process may be easy—for example, in one case a property was sold to someone else who was already part of my study. This process may also be intractable—in another case I was unable to contact the new property owner, despite months of attempts.

Changing from a friendly to hostile manager or owner is one of the biggest challenges to ongoing research. In some cases, you may need to drop the site from your study or only collect limited data. For example, at one property I ended up forgoing soil and fungal sampling and only collecting bird observation data (the parking lot was deemed 'public' enough). However, I was helped in this case by a friendly owner who allowed access for the bird surveys.

Bringing new owners/managers on board, especially midway through the research, may require them to digest a large amount of information. To make this transition easier and to build rapport, there is significant value in setting up face-to-face meetings with property managers/owners that are new to your project, either because they replaced someone or because you've recently reached out to them for access to their property.

Be sensitive to the new owner or manager's preferences for communication as they may differ significantly. This may mean changing how you schedule sampling between years. For example, two of my sites were managed by the same person. When this person changed roles, the new manager requested I cluster multiple requests. Therefore, I went from randomly determining the order of the visits to needing to survey both sites on the same day.

If it has been a few months since your last contact (e.g. between field seasons), it is a good idea to contact properties 6-8 weeks in advance of the next required visit. This allows you to iron out any issues that arise or renegotiate access before data collection needs to begin.

DATA COLLECTION

Note that data collection is generally concurrent with the ongoing relationship management required for accessing private property.

There are a number of considerations with data collection in private property urban ecology research that are unique, and others that are shared with ecology research generally.

Working on private property, from residential to commercial, means coming into frequent contact with residents and tenants. I find it helpful to frame these interactions on a four point scale:

- Level 0: You will frequently be asked to field questions about what you're doing along with related (or unrelated) ecology questions. People may also volunteer information about the site and its history. Frequently, these interactions are positive and residents and tenants can offer information that is valuable to your current and future research. However, they can also be very time consuming or awkward. Each researcher will need to balance the need to get work done vs. the need to be polite in their interactions.
- Level 1: Some of your interactions will be with people challenging your right to be on the property. For these interactions, I've found that the best approach is to be friendly, engage, and explain what I am doing and why. Usually their concerns are quickly ameliorated when you can demonstrate that you know

the property owner or manager and have their permission to be on the site. They may then become interested in your research and ask questions (Level 0).

- Level 2: Almost every researcher has a story about a neighbor or concerned tenant either calling or threatening to call law enforcement on them. When law enforcement or private security is called, researchers have diffused the situation by showing proof that they have permission to be on the property (signed letter, email, etc.) and explaining their research. When an irate neighbor is threatening to call law enforcement, it may be more prudent to retreat and re-negotiate a later sampling date. Asking the property owner to reach out to the problem neighbor may also be helpful.
- Level 3: These are direct, credible threats to the researcher's safety. Get to safety. Consider dropping the site from your study.

As a result of our experiences, other researchers and I have found it necessary to carry permission to be on site (digital or hard copy).

These interactions will be colored by local attitudes and your place in their social context—particularly influenced by gender and race. You know your own situation best! Use your learned coping mechanisms.

To improve personal safety, it may help to dress to communicate intent (high visibility clothing, clipboard, obvious research equipment) or to fit in (nicer professional clothing or as a field ecologist). Other key actions include conducting research in pairs where possible, letting someone know the addresses where you are going and checking in regularly/when finished, and 'borrowing' trusted helpers (boyfriends, husbands, friends) so that you aren't alone when visiting sites.

Access to any type of property also comes with the risk of observing illegal activity. There are well known stories of finding drug operations on federal lands, and I have heard of recreational drug use etc. observed by urban ecologists on private property in urban areas. Generally, people conducting illegal activity on their property are unlikely to let you on their property. If you encounter something illegal, use your individual discretion.

In addition to adults, you will need to deal with children and animals on residential property. Small children may interfere with sampling and you need to be careful not to inadvertently let them into areas where they shouldn't be. Dogs are a particular issue for researchers accessing private residences—both because they can be dangerous and because you don't want to let them escape. Urban livestock, including chickens, goats, horses, and pigs may also be present, and urban beekeeping is growing in popularity. Be sure to ask if there are any small children or animals present and how they should be handled when setting up appointments with residential property owners. However, still be cautious as residents may not communicate the presence of children or animals. Generally, these are not an issue for commercial property, although research on school grounds is a special case.

Biting insects (mosquitos, chiggers, etc.) are also a problem on all types of property. Bug spray, sunscreen, and protective clothing are just as important when conducting urban field research as in other settings.

Additionally, be aware that certain properties and land use types in urban locations may have unique concerns. For example, in England you may need clearance from the Criminal Records Bureau (CRB) in order to conduct research on school property.

RESULTS AND POST STUDY

Many participants will be interested in the results of your study generally, and in the information you gather from their property specifically. You should strongly consider providing updates about their research to the owners and managers that have made the research possible by providing access to their property.

Property managers and owners may be particularly interested if you have collected information about the soil nutrient balance, pH levels, or species on site. Sharing this information with managers and owners (and potentially tenants as well) is an engaging form of public outreach. For example, I received many positive comments and questions about local species after I provided all of the property owners and managers with a summary of the birds and fungi found on their site after the first field season.

SOURCES

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