



Ecological consulting as a career option



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It was a warm afternoon in the Liwonde Forest Reserve in southern Malawi, and I was with a team of botanists and foresters, field-testing a methodology for rapid botanical surveys. We would be using this methodology in our consulting work for the Shire River Basin Management Program, funded by the World Bank through a grant to the Malawi Ministry of Agriculture, Irrigation, and Water Development. In addition to the botanical surveys, we were conducting studies on globally rare plants, birds, butterflies, large mammals, and the condition of the tropical forests and woodlands in the basin. Our goal was to bring updated scientific knowledge about the relationships between biodiversity, ecosystem functioning, and ecosystem services to bear on the goals of the overall program.

Another typical day in the life of an ecological consultant? Well, not really. Ecological consulting usually requires a range of skills, and any given day might involve doing background research online, interviewing key informants, meeting with communities, conducting field surveys or site visits, writing reports, or making presentations.

Ecological consulting involves working for a client to apply ecological science to solve problems in social-ecological systems (Redman *et al.* 2004) and to make those systems more resilient (Walker *et al.* 2004). Ecology is a systems science, concerned with understanding the processes, interactions, and relationships between organisms – including humans, of course – and the physical environment (Cary Institute of Ecosystem Studies 2017). The complexity of those interactions means all ecosystems have emergent properties that make them inherently difficult to fully model and predict, which in turn means that the precautionary principle always applies in trying to conserve or manage ecosystems. The challenge and creativity of ecological consulting lies in helping clients understand and apply those fundamental ecological principles.

The term “consultant” describes the work relationship: consultants are not permanent employees of their clients, which may be government agencies, non-governmental organizations (NGOs), or private companies. Ecological consulting can be through short-term contracts (in my case often of around three to six months), intermittent assistance to an ongoing project, or full-time work over several years. Ecological consultants can be independent small-business owners who “freelance” for multiple clients (as I do) or employees of companies that provide consulting services. These can range from small companies with only a few employees to very large firms. The

consultant–client work relationship often gives consultants more independence and flexibility than regular employees. That independence sometimes comes as a trade-off with financial stability, especially for independent consultants. Some people are not comfortable with the financial planning and confidence needed to weather the normal gaps between consulting contracts; in that case, working for a consulting firm may be a better option.

The potential range of consulting tasks is wide, and includes ecological assessments, analyses, surveys, applied research, evaluations, and strategic planning and project design. All can involve domestic or international work, or a mix of both. Ecological consultants sometimes also teach at colleges or universities as visiting, part-time, or adjunct professors (as I do), and some full-time professors consult on the side.

Who might employ you as an ecological consultant? The range of potential clients is wide and diverse. Your clients could be corporations; government agencies at the local, state, or national level; international agencies or donors; or domestic or international NGOs. Ecologists often work as consultants to carry out tasks required by US federal or state environmental laws and regulatory permitting processes, such as wetland and stream delineation, Clean Water Act permitting, and surveys for endangered or invasive species. A companion article in this *Exploring Ecological Careers* series (Nuttle and Klemow, in preparation) will focus on careers in ecological consulting for regulatory compliance. There are undoubtedly more consultants employed for those types of relatively routine and prescribed tasks than for more complex “big picture” ecological consulting assignments. But even routine, regulatory environmental compliance consulting should be done with full recognition that ecosystems are complex systems and that reductionist views of their management just don’t work.

The academic training, experience, and skills needed for ecological consulting depend in part on what types of tasks and challenges interest you, and whether you want to pursue a graduate degree. With only an undergraduate degree you could find job opportunities working for consulting firms or companies, most likely doing relatively routine tasks such as surveys related to domestic regulatory compliance. With a master’s degree or PhD you would have the research and communication skills needed for more complex and integrative ecological consulting, or for launching your own independent consulting business. Almost any subdiscipline of ecology – community ecology, restoration ecology, conservation biology, or landscape ecology, among others – can pro-

vide relevant knowledge. Some formal academic background in the social sciences is relevant and useful, so try to include some political science, sociology, anthropology, psychology, and economics in your coursework. A good understanding of the scientific method, experimental design, and statistical analysis is also required, and fieldwork experience is invaluable.

Communication skills will give you an edge in ecological consulting. You will need to communicate decision-relevant ecological information to people with (sometimes) no interest in or experience with nature and natural systems, and to motivate decision makers and stakeholders to use and apply the relevant ecological information. That means honing your skills in logic, persuasion, organization, speaking, and writing, and maybe photography, visual communications, and social media. Interpersonal networking, negotiation, strategic thinking, and diplomatic skills help too.

For international ecological consulting, cross-cultural experience is important. Many international consultants I know served in the Peace Corps. Foreign language ability is a plus there; Spanish and French are the most useful for work in the developing world.

Ecological consultants need to keep up on the latest scientific findings in the field so they can apply those in their work as quickly as possible. Reading peer-reviewed journals and attending and presenting at ecological meetings should be routine activities. Ecological consultants can also weave fellowships and scholarships (eg Fulbright Scholarships) into their careers to expand their geographic or subject-matter areas of expertise.

When students or colleagues ask me for tips about how to get into ecological consulting, I usually describe the general elements of my own career path as advice:

- First, get an undergraduate or graduate degree in some field of ecology;
- During or after that, take some time to figure out whether consulting fits with your personality, passions, and mission in life;
- Find ways to get practical experience applying ecological science to social, political, and economic decisions and solving problems in human development; and then
- Find a niche – or create one – for making a living; set yourself up as an independent consultant, or look for a job in a consulting firm.

Although my own career path has been somewhat indirect and idiosyncratic, it followed those general steps. After abandoning the academic career I'd expected, I found my way into ecological consulting, and it has been



Figure 1. Team of foresters and botanists from the Forest Research Institute of Malawi and National Herbarium and Botanic Gardens practicing a rapid botanical survey methodology, in the Liwonde Forest Reserve, Malawi (June 2015).

so rewarding and enjoyable that I've never looked back. If you think you would be interested in ecological consulting, avoid becoming narrowly specialized and don't be afraid to maintain broad interests in ecology. With a strong academic background and solid research skills, you will be able to apply yourself to a range of ecological topics. Get practical, applied experience – complete an undergraduate or graduate thesis on a topic involving ecological applications, or pursue internships, fellowships, or volunteer opportunities with government agencies, NGOs, consulting firms, or corporations. Obtain work experience inside the government agencies, NGOs, or companies that hire ecological consultants; this will provide useful contacts and experience for consulting with them later. Cultivate contacts with potential clients and develop your networking skills. Publish and present your work to establish your reputation as an expert in one or more aspects of ecological consulting. Practice and strengthen your ability to see interconnections, analyze complex systems, and synthesize complex multidisciplinary information.

If you are creative and entrepreneurial you can create a career in ecological consulting and apply your passion for nature and natural systems to help solve societal problems.

■ Supporting Information

References and an author biography may be found in the online version of this article at <http://onlinelibrary.wiley.com/doi/10.1002/fee.1800/supinfo>