

# The Role of Universities in Protected Area Management: Considerations for the Future

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## Introduction

IN NOVEMBER 2014, the International Union for the Conservation of Nature (IUCN) convened the sixth-ever World Parks Congress, a global forum about conservation, management, and development of protected areas around the planet. As an event which occurs only once every 10 years, it is considered a seminal occasion that brings together thousands of individuals from all types of institutions (e.g., government, nongovernmental organization [NGO], private sector), roles (e.g., ministry official, NGO director, herder, fisherman) and areas around the globe to engage in discourse and learning about local actions that address pressing global issues affecting protected areas. It is a pivotal forum in which information and lessons learned over the past decade, typically at a local or regional scale, can feed into a bigger picture of conservation.

In the United States, 2015 represents the 125th anniversary of the Morrill Act, the second of two bills of that name passed in the late 1800s which gave grounding and support to establish land grant and agricultural academic institutions. These institutions were mandated to integrate agriculture and mechanic arts in their teaching and research, and, from that, other land-focused disciplines emerged within the same institutions over time (e.g., natural resources management). In the 1890 Morrill Act, the United States Congress extended funding for development of additional land grant institutions focused primarily in the southern part of the country. Today, land grant universities, some more than 200 years old, are institutions in which teaching, research, and service related to protected areas is arguably most relevant in higher education in the United States.

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*The George Wright Forum*, vol. 32, no. 3, pp. 308-316 (2015).

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In 2016, the United States will commemorate the centennial anniversary of its National Park Service (NPS), the second-ever such agency in the world situated at a national level of government (Parks Canada, founded in 1911, was the first). The National Park Service manages over 400 units across the country for a variety of cultural, historical, and ecological values, and many are recognized around the globe—Yellowstone, Grand Canyon, and Yosemite national parks, for example. Of all the responsibilities of the federal government, management of national parks is arguably among the most cherished by residents of the United States.

Thus, the United States is preparing for the 100th anniversary of the National Park Service in the year following the 150th anniversary of legislation that established land grant institutions that are imperative to the training of protected area managers and research. And, shortly before thousands of people from around the world convened in Sydney to discuss bigger-picture issues around protected area management, we convened a group of individuals from universities and protected areas to address how universities can continue to support protected areas effectively into the future.

Levitt's (2014) *Conservation Catalysts: The Academy as Nature's Agent* highlights how universities and colleges have aided in large landscape-scale conservation. The purpose of this paper is to keep this conversation going and look for ways to improve how and what we are doing as national parks enter their second century. We ask: What have we learned about how universities and protected areas can support one another with their respective missions? What might that support look like into the future, given today's challenges, including biodiversity loss and climate change, which create tremendous uncertainty for protected area managers?

We began this discussion in Sydney at the World Parks Congress with approximately 50 international participants, and also reviewed relevant literature about the topic, and continued to deliberate about it months afterward. Subsequently, we facilitated a second conversation at the George Wright Society Conference in April 2015 with approximately 25 land managers and academics (largely US-based), examining specific opportunities for improving the role of universities and potential barriers to enabling the fruition of these concepts. The George Wright Society Conference convenes over 700 managers and scientists from parks and protected areas alongside researchers from academic institutions to facilitate an interdisciplinary forum to discuss the status of protected area research and management.

### **Principles and suggestions for good partnerships**

Based on the results of comparative, thematic content analysis (Creswell 2007) on the discussion data from the World Parks Congress and George Wright Society Conference, and through a study of prior literature, we have compiled principles and suggestions for the role of universities in protected area management now and for the future. Furthermore, we searched for and researched examples that illustrate each of these principles, highlighting the types of roles universities have and can have with protected areas. Many of these principles have been at the heart of university protected area work already, and their inclusion here represents the endurance of those principles over time, as we believe they will continue to be important into

the future. Other principles are more recent, demonstrating how universities can support protected areas, which we hope will stimulate additional discussion and brainstorming.

### **Universities can provide diverse research expertise that informs decision-making**

Universities are uniquely resourced in that they have disciplinary experts and future land stewards (i.e., students) who can lead inquiry to provide scientific approaches and knowledge needed to untangle complex socioecological challenges. Universities have biologists, sociologists, ecologists, anthropologists, historians, and dozens more experts, typically sharing the same physical campus where they have the opportunity to collaborate to address the research needs and management challenges in protected areas. The refrain that our natural resource issues, including those in protected areas, need interdisciplinary approaches is widely accepted. University researchers must remember this unique opportunity they have, take advantage of it to address our natural resource challenges, and leverage the capacity of students to help address these issues.

Cooperative Ecosystem Studies Units (CESUs; <http://www.cesu.psu.edu>) are consortiums of federal and local government agencies, NGOs, and academic institutions that facilitate and provide a mechanism for collaborative problem-solving. CESUs help facilitate research-based partnerships between protected areas and universities, as well as provide resources for university partners to collaboratively explore and inform current challenges, and train the next generation of scientists and leaders.

For example, recently, a 10-year CESU-affiliated collaboration between the NPS Natural Sounds and Night Sky Program and the Park Studies Unit at Penn State University was given the National Network Award by the CESU Network. At the university, protected areas researchers created the Natural Sounds Working Group, comprising experts from the College of Engineering, College of Health and Human Development, College of Arts and Architecture, and College of Liberal Arts. This group facilitated experts from medicine, psychology, physics/acoustics, recreation and park management, philosophy, ecology, and bio-behavioral health to conduct studies examining the interaction between acoustic energy and humans, with the focus on national park soundscapes. This partnership, and collaborative teams like it, can help NPS think through complex issues and provide data to managers in the field making tough decisions.

### **Universities can anchor long-term ecological research for protected areas**

Universities can serve as a steady source for consistent and ongoing long-term research at protected areas. The Long Term Ecological Research (LTER) Network, started by the National Science Foundation in 1980, is one such example of universities collaborating with protected areas to conduct multi-decade research and monitoring.

For example, in the United States, the Harvard Forest (a parcel of land as well as a team of experts hosted at Harvard University since 1907 and supported by the LTER Network) is home to a team of researchers from universities across New England who pursue social-ecological research in conjunction with undergraduate and graduate students participating in summer internships, master's degrees, and PhD programs. One of their most innovative ini-

tatives is the Wildlands and Woodlands Vision, a program aimed at conserving 70% of New England's forests from development, with an emphasis on long-term monitoring of the conserved protected areas. This model of research and outreach has proven particularly relevant in a region where much of the land is privately owned, requiring protected area managers, land trusts, and universities to collaborate with landowners to integrate science and management to appropriately monitor land change over multiple generations (Foster et al. 2014).

A similar model of collaborative research has been adopted by the James Hutton Institute and Cairngorms National Park in Scotland (Blackstock et al. 2011), where researchers specifically work with the park and associated stakeholders to provide meaningful, cooperative results. Furthermore, new partnerships between the University of the Highlands and Islands in Scotland, the United Kingdom Environmental Change Network, Centre for Ecology and Hydrology, the James Hutton Institute, and Scottish Natural Heritage recently resulted in a memorandum of understanding, creating the first long-term social-ecological research platform (LTSER) in the United Kingdom, through Cairngorms National Park. This initiative will foster holistic, interdisciplinary research approaches that can better inform park management and regional conservation efforts.

### **Universities can be objective third-party thought leaders for protected areas**

Universities have a unique opportunity to challenge the status quo by providing an objective critique regarding socioecological health. Parks and protected area managers make decisions in a politically charged environment whether they are confronting issues of wildfire or climate change. Decisions can be swayed by science but also by political pressures in cases where agencies seek funding from a legislative body with a political agenda. Universities should have (and protect) academic freedom, and therefore they have the opportunity to play a role in objective data gathering and analysis, and help in decisions where controversy can be fueled by perceptions of the public or by political leaders with differing views. Furthermore, universities should provide a policy-related curriculum that enables future scholars and land managers to develop research that can objectively inform policy (Clark 2001).

Government officials in Florida were recently in the US national news for allegedly banning the use of terms such as “climate change,” “global warming,” and “sea-level rise” to limit associated political controversies (Korten 2015). In response, long-time climate researchers at the University of Miami's Department of Geologic Sciences and their colleagues, with extensive research relationships with NPS and other federal agencies, were willing to speak out publicly against the abolition of such terms. It is imperative that academics with this level of expertise in a given area, such as climate change science, be willing to stand behind sound research, to provide guidance without being swayed by political pressures.

Another example of proactive use of resources and research around this controversial topic is the recent publication addressing climate change resilience, collaboratively developed by academic units at Wageningen University in the Netherlands, the IUCN Regional Office of West Asia, and various other regional partners. The toolkit discusses the challenges associated with, and suggested strategies for, mitigating climate change through practical plans and policies that can be adopted across local and national levels (IUCN 2014). Collaborative

publications such as this extend beyond the controversies surrounding climate change, by providing practical, scientifically driven suggestions for mitigating associated impacts.

### **Universities should prepare managers to address contemporary challenges**

To address contemporary protected area challenges, universities should prepare future protected area managers with the necessary suite of skills and knowledge, including traditional biological and ecological sciences as well as disciplines related to communication, conflict, planning, and leadership. Many, if not all, of the biological and ecological challenges in protected areas have a social aspect to them, whether it be part of the greater context of the issue, the cause of the issue, or a combination of both. Consequently, preparing students to address challenges and issues in protected areas requires more than biological and ecological competencies. They must know how to facilitate processes with stakeholders, communicate science to non-science audiences, and understand the social–ecological map of an issue. They must have the skills to mobilize people to do something different, and translate a bigger vision of ideal conditions into day-to-day activities.

As a result, universities should train students to be equipped to communicate and collaborate across disciplines and across cultures. Students should be well versed in other languages and cultural norms, and should evaluate case studies from both local and global perspectives. Universities should provide opportunities for testing new methodologies, technologies, and adaptive management strategies that incorporate systems-wide inclusivity. Finally, universities must foster teaching, associated research, and outreach that applies these tested best-practice adaptive monitoring and management tools.

In addition, many universities with conservation programs are geographically and strategically situated to implement field-based experiential approaches for teaching the diverse skills needed for effective protected area management. Some institutions even have their own protected areas, and others are located in close proximity to areas with natural, cultural, and/or historic significance. Universities should take these opportunities to integrate nearby protected areas in instruction.

At Colorado State University, the Conservation Leadership through Learning (CLTL) master's program teaches students about conservation and protected area management through the lenses of economics, political science, anthropology, sociology, and conservation biology. Students complete coursework in collaborative conservation, systems thinking, leadership, and policy, in addition to that in biological diversity and ecosystem sciences. Students put their coursework into action, with weeklong intensive projects centered on a current issue, as well field components consisting of four-to-six-month immersive partnerships with protected areas, conservation NGOs, and stakeholders.

For more than a decade, faculty members at California State University–Channel Islands have worked collaboratively with Santa Monica Mountains National Recreation Area, which closely borders the campus, as well as nearby Channel Islands National Park to facilitate mutually beneficial partnerships. Since the creation of the university, the institution and Channel Islands National Park has strived to create a “park–university learning community,” where shared spaces (e.g., NPS offices on campus, and student research stations on federal

land) foster a united vision for teaching and learning about protected areas. For example, the university offers an interdisciplinary undergraduate course, “The National Park,” where curriculum is jointly taught by the superintendent of the park and by faculty in environmental science, resources management, and political science. The course includes student projects focused on engaging peers in the park experience, as well as a four-day experiential trip to Yosemite National Park. Finally, the university and NPS have established the Santa Rosa Island Research Station, a living-learning laboratory on the island, where students aid the park by conducting inventory and monitoring research while simultaneously expanding their understanding of the unique natural and cultural resources of the area.

### **Universities can facilitate citizen science**

Protected area managers rely more on citizen science, and thus universities can facilitate research and evaluation about viable and successful models of it, and help build practitioners’ professional development in this contemporary option for data collection. Citizen science, or engagement of nonprofessional volunteer scientists in research, is a methodological strategy that allows for local or global-scale ongoing ecological-based data collection. This form of data collection and engaged research will be increasingly vital to monitor socioecological health locally and globally. However, currently the validity of these data is frequently questioned because of the means in which they were collected. To address this, universities can and should facilitate the development of legitimate citizen science strategies. Universities can enlighten the professional scientific community by edifying non-expert scientist-students to develop solid methodological approaches (i.e., those that are rigorous, ethical, replicable) through engaged learning opportunities.

For example, scientists at Colorado State University’s Natural Resource Ecology Lab developed the CitSci.org platform to create a standardized method that any protected area can adapt and implement to establish a citizen science data collection program that can result in usable and trustworthy data. Through CitSci.org, practitioners can create their own customized citizen science webpage, engage volunteers in all stages of research from project design and data collection to result analysis, recording and collating data, receiving support from other researchers, and coordinating projects. To date, over 150 projects have been contributed with over 30,000 observations on subjects as diverse as wildlife monitoring, air and water quality, and energy use.

### **Universities should help develop communication strategies for informing policy**

Universities are uniquely situated to positively influence public understanding and acceptance of science, and they are often perceived by the public and many (though hardly all) policy-makers as trusted sources of scientific information. Effectively communicating science to non-scientists can be tricky, yet it has important implications for influencing public policy and what the public demands from its policy-makers. The public encompasses a high diversity of demographics, values and attitudes toward nature, prior experiences, and belief systems. Universities can help protected areas understand their specific target audiences, and how important, valuable scientific findings and outcomes can be communicated to, and un-

derstood by, critical audiences. This can ultimately help shape human attitudes, behaviors, and policies that support the conservation of protected areas.

The Northern Climate Network (NCN) at Northern Michigan University, on the south shore of Lake Superior in Marquette, Michigan, is a campus–community collaborative brain trust sponsored by the university’s provost and vice president of academic affairs. The NCN has more than 100 members, including faculty, staff, and students; local government offices and elected officials; representatives from nearby US Forest Service, US Fish and Wildlife Service, NPS, and state natural resource management offices; and several NGOs, including The Nature Conservancy and a regionally recognized organization, the Superior Watershed Partnership. The NCN is a catalyst for numerous collaborative and applied research projects related to climate change adaptation and community climate literacy in the region. A dozen members serve as representatives to Marquette County’s Climate Adaptation Task Force, which is developing a public information campaign about the local impacts of climate change on the county’s natural resources. Ultimately, the NCN has linked dozens of academics with practitioners, and elected officials with scientists, in order to enhance public literacy about climate change and, ultimately, better inform local natural resource policy.

### **Universities should provide accessible professional development**

Universities should leverage their online learning platforms to provide protected area professionals with accessible professional development and trainings about contemporary issues, skills, and techniques. Nearly every university now has an online platform from which to deliver instruction. This is an opportunity to reach students beyond the confines of the physical campus, and expand the reach of people who can learn from academic experts, to communities in which higher education and professional development was previously inaccessible. Many protected areas are in remote locations, perhaps hundreds of miles from the nearest university. Online education brings the classroom to them, a classroom that, in close partnership and ongoing discussion with protected area personnel, can address the skills and competencies needed to address contemporary protected area issues (Dawson 2007).

For example, the Eppley Institute, an outreach program within Indiana University, demonstrates how a university can provide practical distance education opportunities to protected area professionals at local, regional, and national organizations. The institute has collaborated with NPS, other agencies, and even professional organizations such as the Society for Wilderness Stewardship to develop tailored online courses for employees regarding natural asset management, interpretation and visitor engagement, philanthropy, administration, and safety. In partnership with the Arthur Carhart National Wilderness Training Center, the Eppley Institute has developed online training courses for federal employees on topics such as climate change, wilderness management, and cultural stewardship. Many courses are accredited through continuing education credits, and all are evaluated for learner satisfaction, transfer of knowledge, and performance improvement.

### **Conclusion**

Protected area management has reached and celebrated many milestones. The World Parks

Congress is a once-a-decade example of such a milestone, and the mere fact that we have such an event represents the importance and stature of protected areas in contemporary society. In addition, universities have evolved to foster the development of land managers, and informed scientific monitoring practices within these invaluable places for more than 125 years. During this time, policies and management strategies have changed, as have university curricula and methodological approaches. The World Parks Congress in 2014 and the recent George Wright Society Conference in 2015 not only commemorated the past but also demonstrated the exciting future of protected areas management. This future lies to a large degree within the hands of universities and the education, service, and research they provide. The principles, and the associated examples we have offered in this paper, highlight some of the current roles universities play in protected area management, as well as suggestions that should be considered for the future. We are optimistic about the future, and welcome the challenges ahead. Yet we realize that universities must continue to evolve to adequately inform management despite unforeseen social and ecological changes and challenges. To close, we hope this paper stimulates contemplation of your role, as an academic, land manager, stakeholder, or other related constituent, to continue allowing universities to work as the conduit through which our actions aid in the future preservation of our protected areas.

### Acknowledgments

The authors would like to thank the organizers, group discussion leaders including Ana Porzecanski, Eleanor Sterling, Gary Machlis, Matthew McKinney, Steve Morris, Vinod Mathur, and Tara Teel, and participants in our sessions at the World Parks Congress and George Wright Society Conference. We would also like to thank Don Rodriguez and Jessica Thompson for their valuable input regarding the principles and associated examples provided in this manuscript.

### References

- Blackstock, K., L. Dinnie, H. Trench, and G. Miles. 2011. Co-researching the Cairngorms: Supporting the aims of, not just researching in, the Cairngorms National Park. *Scottish Geographical Journal* 127(1): 40–60.
- Clark, T.W. 2001. Developing policy-oriented curricula for conservation biology: Professional and leadership education in the public interest. *Conservation Biology* 15(1): 31–39.
- Courter, J.R. 2012. Graduate students in conservation biology: Bridging the research–implementation gap. *Journal for Nature Conservation* 20(1): 62–64.
- Creswell, J.W. 2007. *Qualitative Inquiry and Research Design: Choosing among Five Approaches*. Thousand Oaks, CA: Sage.
- Dawson, C.P. 2007. New opportunities for educating future wilderness and wildland managers in a changing technological world. *International Journal of Wilderness* 13(3): 36–39. Online at <http://ijw.org/wp-content/uploads/2007/04/Dec-2007-IJW-vol-13-no-3small.pdf>.
- Foster, D., D. Kittredge, B. Donahue, K.F. Lambert, C. Hart, and J.N. Levitt. 2014. The Wildlands and Woodlands Initiative of the Harvard Forest, Harvard University. In *Con-*



*ervation Catalysts: The Academy as Nature's Agent*, J.N. Levitt, ed. Cambridge, MA: Lincoln Institute of Land Policy.

IUCN [International Union for Conservation of Nature]. 2014. *A Guiding Toolkit for Increasing Climate Change Resilience*. Gland, Switzerland: IUCN.

Korten, T. 2015. In Florida, officials ban term 'climate change.' Online at <http://fcir.org/2015/03/08/in-florida-officials-ban-term-climate-change/>.

Levitt, J.N, ed. 2014. *Conservation Catalysts: The Academy as Nature's Agent*. Cambridge, MA: Lincoln Institute of Land Policy.

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