Dissecting Credibility: Components of Credibility for Science/Resource Management Professionals

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Background/purpose

The National Park Service (NPS) is developing the Career Field Academy, a learning and development program for employees in all career fields. Seven career field tracks are being developed, including one for natural resource professionals. Development of the Career Field Academy's curriculum for natural resource professionals began in earnest in 2010, building on several previous efforts that included the assessment and identification of important career field competencies (NPS 1996).

One of the important competencies identified by NPS for natural resource professionals was "professional credibility," defined as "not only scientific knowledge and abilities, but also contributions to science and scientific endeavors which are recognized by peers in government agencies and the academic community as providing a solid foundation and leadership in the level and type of natural resource work performed." The following associated sub-competencies were identified:

- Ability to develop an active network of professional interaction with peers in the scientific community;
- Ability to publish articles in peer-reviewed publications and/or make presentations at scientific meetings;
- Ability to maintain a level of scientific knowledge and skill in application that are recognized by peers in government agencies and the academic community as credible and providing a basic foundation for work provided;
- Ability to carry out peer review of scientific reports, and to participate in developmental assignments as a member of teams reviewing natural resource programs;
- Ability to establish and maintain networks in fields outside own discipline as directed or with guidance; and
- Ability to participate in professional meetings in field of expertise.

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Teaching "credibility" to build competencies requires study, planning, and curriculum development. The authors were part of a natural resources work group coordinated by the natural resource career field training manager, National Park Service, Washington Office of Learning and Development.

Credibility of scientists/science professionals

Scientific credibility has been the subject of numerous papers. In the politics of science, truth and credibility are not one and the same (Shapin 1995). Credibility is the product of complex and contingent social and cultural processes. There can be no one recipe for how to produce credibility. The means by which credibility is developed, maintained, distributed, contested, and lost are often believed to be too complex and contingent to generalize. However, there are elements of credibility to consider regardless of circumstance.

Some see a more simplistic interpretation in which their knowledge is enough to establish their credibility. However, no claim of knowledge has inherent credibility (Alagona 2008). All claims of knowledge must win their credibility through social and cultural processes, and conditions under which all claims of knowledge achieve credibility may differ depending on subject matter. As Shapin notes, knowledge alone is not power. Statements of fact mean different things to different people. The truth does not "shine by its own light."

Scientists often make the mistake of believing that credibility and objectivity are directly linked—that credibility derives from the transcendent power of unbiased science, and that the appearance of advocacy can only damage their professional reputations (Gill 2001). And while that objectivity contributes to credibility, the literature offers no evidence for a clear universal relationship between credibility and objectivity. Alagona observes that scientists with the most public credibility are not those who have cultivated a reputation of objectivity among their peers. Rather, they are the ones who have devoted their time to public service and participation in collaborative planning efforts, articulated their biases and opinions, worked to find common ground among their fellow citizens, and respected the ideas of non-experts who have every right to participate in a democratic decision-making process (Rigg 2001).

The role of scientists and science professionals is often described using several models. The traditional understanding suggests that where science is relevant to policy processes, the role of the scientist is to facilitate management decisions by providing objective scientific information to managers and policy-makers, who in turn have the primary responsibility to debate management options, interpret scientific information, and make decisions (Lach et al. 2003). In this model, scientists lose their credibility if they cross the line between science and policy or management. In natural resource management, however, the emerging model has scientists engaged in public decisions, actively involved, interpreting the scientific data and findings, and thus, finding themselves in a special position to advocate for specific management policies and alternatives. Wagner (1999) indicates that ecologists should avoid advocacy of public policy options. Scientists can help lay out the value implications and consequences of policy alternatives, but they should keep their environmental value judgments to themselves.

The traditional tools used by scientists for judging credibility in the scientific arena—conceptual models, quality of journals, and even data generated—are not strong factors for

managers, interest groups, or members of the public in determining a scientist's credibility (Lach et al. 2003). For these groups, a scientist's credibility appears to be based on his or her disciplinary reputation, on the practical nature of the research conducted, and on the experience and knowledge of place-specific sites. His or her credibility is the ability to deliver research results that managers and others can use, and to communicate with other groups. The scientific culture values publication and peer review; managers and the public value communication of research results, on-site trips, and demonstrations (Lach et al. 2003).

Being credible to all camps—other scientists, managers, the public, and others—requires different complementary emphases, integrated and balanced.

Teaching credibility

How would we help employees understand credibility? How can we help them understand the elements of credibility, and the investments they need to make in these elements, and how to build credibility with different audiences?

Prior to curriculum development, the work group assessed how the competency—credibility—would manifest in "tasks" and what those tasks would look like when performed well. What does "credibility" look like? How do we build credibility in individuals, teams, collaborations, and organizations?

The authors assessed, analyzed, and discussed these tasks and "pictures" of credibility, and drew conclusions included in the Credibility Model (below). They also consolidated current guidance related to scientific integrity, including the code of conduct.

Building credibility

Professional credibility is larger than scientific credibility, but certainly scientific credibility is core to performance in the natural resources job series.

For NPS natural resource professionals, their credibility will ultimately define them professionally. It will either give them great opportunities or limit their options. The National Park Service and other agencies need their natural resource professionals to be credible, because opportunities and options extend to these organizations as well.

Each of the authors knows examples of science professionals who were not at the top of the professional credibility scale. Yes, some of these were because of less-than-stellar science, but most were because of missed opportunities, lack of effort, or unawareness of the need to demonstrate certain things related to credibility. Some may not put in the effort to remain current in their science. Others may think anything other than their science is unimportant. As Alagona (2008) noted, some think knowledge should be enough to be seen as credible.

Things happen in the course of a career. Some things are planned, some are not. Some people are deliberate about their science and scholarship, and may or may not be deliberate on other matters that reflect upon their professional credibility, such as interactions with managers and the public. Building proficiency at something, and eventually becoming recognized as credible, can be happenstance or it can be planned out as part of a career, and diligently built, maintained, and protected.

Science professionals need to be active in their science community. That means being current, networking, publishing, getting and participating in peer review, knowing and abiding by the code of conduct, etc.

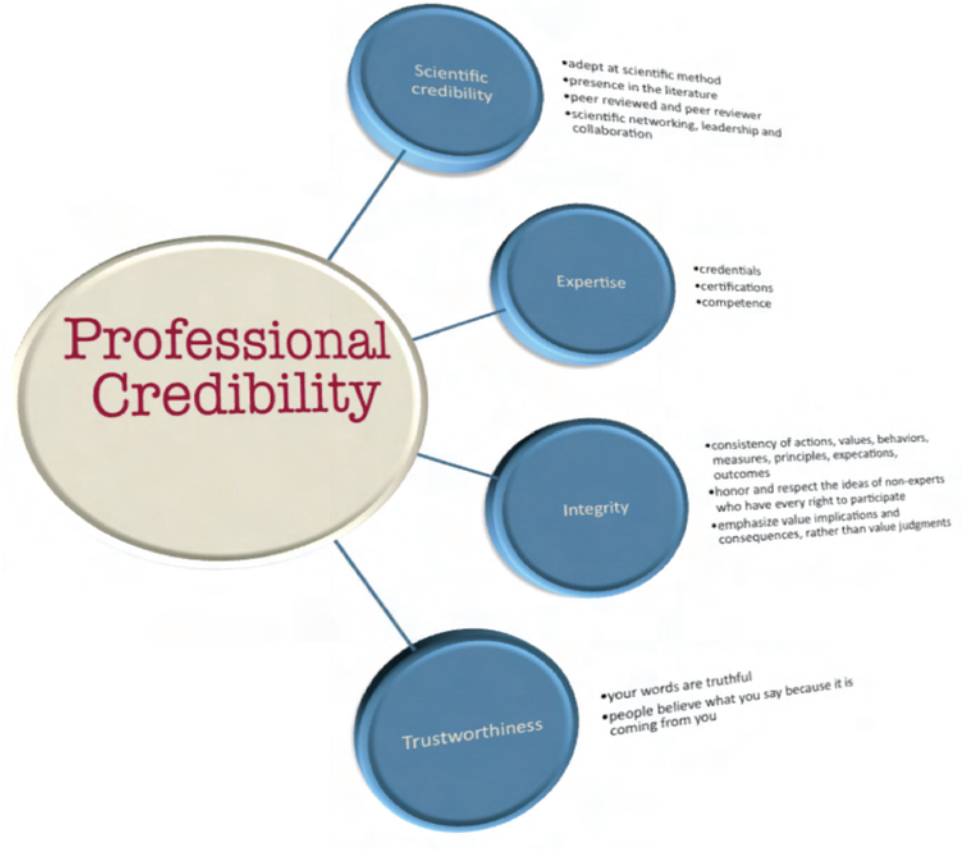
But there is more to professional credibility. The Credibility Model (Figure 1) and accompanying table (Table1) illustrate and discuss the various components/elements of credibility for natural resource professionals.

Most new natural resource professionals in the NPS (and other agencies) have an intuitive understanding of what may be required to build some level of credibility. However, knowing the elements of credibility and being more deliberate in building that credibility will aid them not only early in their career, but also as they plan for the next phase of their career, when their jobs will become more complex with more responsibilities.

A few points for consideration:

- Natural resource stewards may have a better chance of achieving credibility if they begin building a clear picture of how to remain current in their discipline, and also advance their science and scholarship as leaders and participants in a wide variety of professional activities, including how to collaborate in professional organizations and societies (G. Davis, personal communication 2012). Natural resource professionals will

Figure 1. The Credibility Model: Components of credibility for scientists and resource management professionals.



benefit from knowledge of how to be fully functioning members of professional communities, ranging from local associations, through regional and national societies, to international and honorary/elected academies (such as American Association for the Advancement of Science and National Academy of Sciences). Service to these societies is likely most effective if woven into career plans, not only to remain current, but to help

Table 1. The components of credibility and their attributes: scientists and resource management professionals.

Professional Credibility		
Components/	**Attributes**	**Related Characteristics**
Scientific Credibility	Adept at scientific method and follows scientific standards	Showing scientific and scholarly integrity including code of conduct
	Publications	Maintaining professional skills through publications
	Peer Review	Participating in peer review process
	Scientific networking, leadership and collaboration	Using networking and collaboration to amplify and extend personal and program capabilities
Expertise	Credentials	Knowledge/Expertise, arising from your college education and independent studies
	Certifications	Being recognized through a formal procedure by an accredited or authorized person or agency, as having the attributes, characteristics, understanding, experience, qualifications and/or status, to meet requirements or standards needed to conduct or carry out an activity
	Competence	Able to effectively, efficiently and/or successfully put those credentials and certifications to work, and be relied upon to do so.
Integrity	Consistency	Consistency of actions, values, behavior, measures, principles, expectations, outcomes. That consistency strengthens your reputation; inconsistency erodes it. Whom do you respect for their integrity? Why? Watch them under difficult circumstances and see what you can learn from them.
Trustworthiness	Trust	Your words are truthful. People believe what you have to say because it is coming from you.

them remain aware of credentials and collaborations needed to get there. If early in a career individuals have awareness that at some point in their career, they may be called upon to contribute as leaders in these professional communities (through planning and service), they will be prepared to do so.

- Natural resource professionals will benefit significantly if they have the knowledge, skills, and abilities to interact and communicate effectively with a variety of audiences, including managers, co-workers, and the public. Credibility is likely to grow if they interpret the results of their own work and explain science, scientific findings, applicability to management, and relevance to a site or place, and do so in a way that preserves their reputation for objectivity and adherence to appropriate scientific conduct. They also will benefit through a willingness to build and maintain a reputation for integrity and trustworthiness with these audiences.
- Natural resource professionals can best grow their careers if there is transparency and understanding of the career ladders arching to the highest levels in federal service, such as senior technical positions equivalent to senior executive service positions. There are myriad career opportunities for scientists and scholars, and those new to their careers need to know the opportunities, risks, and pathways. Opportunities to shoulder levels of responsibility, complexity, internal and external politics, and public visibility at future stages of a career can arise or disappear due simply to credibility.
- The process of building credibility requires analysis and reflection upon many things. The Career Field Academy for natural resources will emphasize including this analysis and reflection in career planning.

Conclusions

Although this is often offered as a complex topic or an over-simplified one, the concepts of credibility are multifaceted and can be distilled down to some fundamental elements, for learning and practice.

If science professionals are deliberately aware of, plan for, and intentionally build around these components of credibility, they are likely to significantly increase their effectiveness in early career phases, and build a foundation for credibility in subsequent, more complex assignments. The ability to apply the components described above in combination with career ladder opportunities will aid in the development of professionals and their successes in being fully-functioning members of professional communities at local, regional, national and even international levels. A willingness to serve, and prepare themselves to lead when called upon, will be career-defining characteristics.

The NPS Career Field Academy for natural resources will emphasize components of the model (presented) in its training and development curriculum.

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