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A Mental Model of Science Informed by Public Lands Managers: Increasing the Chances for Management Based on Science



Keywords: Science planning; Wilderness; Manager survey; Sustainable management

Background & Management Issues: Public lands science planning has mostly focused on answering specific discipline-oriented questions. An alternative approach is to guide research planning with a more complex analysis of the collective purpose of multi-discipline research topics. From over 1200 responses received in 2014, a mental map of research needs, prioritized by the purpose of the research, led to proposal of 5 major strategic science planning dimensions: (1) basic research to understand effects of various threats; (2) integrated research on “big” emerging issues that lend themselves to larger than wilderness issues; (3) applied research to evaluate stewardship effectiveness; (4) applied research to support stewardship tool development and; (5) applied research to support inventory and monitoring. A strategic science plan that identifies targets according to this mental model will increase likelihood of science being used to guide management.

Project Objectives:

- ✓ Demonstrate how management can inform science.
- ✓ Change how we view science needs and, consequently, create long term impacts on stewardship direction and accomplishments.
- ✓ Guide research planning with a more complex analysis of the collective purpose of multi-discipline research topics.
- ✓ Obtain input from managers to consider in strategic sustainable planning for research to support the National Wilderness Preservation System (NWPS)

Project Description:

Updating science goals and objectives requires identifying today’s and tomorrow’s most pressing stewardship issues. A Wilderness Manager Survey (WMS) was developed and administered to managers in all four federal agencies that manage the NWPS. The emphasis of this national survey was to have managers think about the most pressing challenges likely to face wilderness stewardship in the future.

This paper next proceeds with a review of the history of wilderness management and science strategic planning. Section three describes methods of the WMS and the unique analysis and evaluation criteria that serve as the foundation of the resulting mental model. In Section four, the results of the analysis are presented, and finally, Section five concludes with a discussion of the benefits of a new mental model that could facilitate a shift in thinking from only the traditional approach of management based on science to include one of science informed by management.

Results:

Analysis of a survey of 368 federal wilderness managers demonstrates how management can inform science. From over 1200 responses, a mental map of research needs, prioritized by the purpose of the research, led to proposal of 5 major strategic science planning dimensions:

- ✓ Basic research to understand effects of various threats
- ✓ Integrated research on “big” emerging issues that lend themselves to larger than wilderness issues
- ✓ Applied research to evaluate stewardship effectiveness
- ✓ Applied research to support stewardship tool development and
- ✓ Applied research to support inventory and monitoring. A strategic science plan that identifies targets according to this mental model will increase likelihood of science being used to guide management.

Management Implications:

- ❖ Guide research planning with a more complex analysis of the collective purpose of multi-discipline research topics.
- ❖ Reconceptualization of wilderness science in a way that is more visionary.
- ❖ Identifying today’s and tomorrow’s most pressing stewardship issues.

Publications / Products:

 Watson, A. E.; Armatas, C. A. A Mental Model of Science Informed by Public Lands Managers: Increasing the Chances for Management Based on Science.

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<i>Major themes</i>	<i>Narrative summary</i>	<i>Basic or Applied</i>	<i>Short-term, Medium-term or Long-term</i>
Research on Understanding	Science for wilderness	Basic	Long-term
Research on “big” emerging issues	Wilderness for science	Integrated Basic	Long-term
Research on stewardship effectiveness	Science to sustain wilderness in larger systems	Applied	Medium-term
Research on stewardship tools	Science to develop and test tools	Applied	Short-term
Research to support inventory & monitoring	Science to produce baseline data and guide monitoring protocol	Applied	Short-term

This summary prepared by M Snyder 06/2018.