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Science Review for Forest Plan Revision in the Southwestern Region

Version 2.1

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Submitted by the
Science Review Work Group

USDA Forest Service
Southwestern Region

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Operational Draft: This document is prepared to provide guidance to forest plan revision teams. As this guidance is implemented we expect to learn improved ways to do this work. As we learn, this document will be updated.

Introduction

Between 2005 and 2008 all national forests in the Southwestern Region will likely initiate Forest Plan Revision under the 2005 planning rule. The Rule outlines the role of science[1] in the planning process and requires the Responsible Official to take into account and document the use of best available science. This will be accomplished by instituting a science review process as described in Forest Service Directive FSH 1909.12, Chapter 40, Section 41. The Responsible Official will determine and document how scientific findings, including any which may be contrary, are considered and used in forest plan revision products, processes, and approved plans. At a minimum, the Responsible Official must assess the scientific credibility of the: 1) Methods selected and applied to evaluate plan components, 2) Information gathered and applied for these evaluations, and 3) Synthesis, interpretation, and inferences drawn from these evaluations.

Purpose

The purpose of this paper is to outline a science review process for the revision of R3 forest plans that is consistent with the 2005 planning rule and directives. This paper defines the levels of scientific review and reviewer requirements, and provides examples and guidelines for consideration by Responsible Officials undertaking forest plan revision in the Southwestern Region. This process will help ensure that planning documents and processes have appropriately considered the best available science.

What is Science Review?

Science review is a process to determine whether scientific information of appropriate content, rigor, and applicability has been considered, evaluated, and synthesized in the documents that underlie the approval of a revised forest plan. Science review does not advise the decision maker for or against a particular course of action, nor does it add to the body of scientific knowledge. The directives[2] state that "The purpose of science reviews is to enhance and maximize the quality and credibility of plans and planning evaluations."

Background

Under the 2005 Planning Rule, the Responsible Official conducts science reviews according to the process outlined in FSH 1909.12, Chapter 40, 41.2. There are four steps to the review process which include planning, conducting, responding to, and documenting the review. The Responsible Official may choose among several methods to conduct the reviews. These include but are not limited to the use of independent peer reviews, local and regional resource specialists, a science advisory board, and review by regional experts or other methods. The method chosen will depend on the level of review that is needed

[1] See 36 CFR 219.11
[2] See FSH 1909.12, Chapter 40, 41.1

There are four levels of science review outlined in the directives[3]. Region 3 will use varying levels of review based on factors outlined in FSH 1909.12, Chapter 40, 41.21, Exhibit 02. These include state of knowledge, data availability, controversy, risk, and spatial and temporal scales of issue. The science review involves evaluating whether current and appropriate scientific information has been adequately considered, interpreted and summarized: and if consequences, uncertainties, and risks are disclosed in documents supporting forest plan decisions.

Responsibility

It is the Responsible Official's decision to determine and document what level of science review is appropriate, at which phases of the planning process, and if the cost of the review outweighs the expected benefits of the review. [4] At the forest level, the Responsible Official is the Forest Supervisor. For regional direction and assessments, the Director of Ecosystem Analysis and Planning (EAP), in consultation with other directors, determines the appropriate level of science review. R3 plan revision processes were regionally developed and will be applied consistently across the region; therefore most science review will be conducted at the direction of the Director of EAP.

As required in 36 CFR 219.11, the Responsible Official shall address and must document, if and how:

- The best available science was taken into account.
- Substantial uncertainties were identified and evaluated.
- Substantial risks were identified and evaluated.
- Science was appropriately interpreted and applied.

The Southwestern Region revision strategy is to provide the forests with assessments and plan revision direction that have already had sufficient review, including any needed science review, at the regional level. When the need occasionally arises at the forest level to conduct science review, regional reviews of regional direction and assessments will provide reference points and examples for forests. Forest science review shall be coordinated with the Region to assure that unnecessary repetition is avoided and that undesirable precedence is not established.

Levels of Science Review

If the Responsible Official determines that a science review is needed, he/she should define the scope, the relevant issues, and what needs to be reviewed. The directives[5] provide for four levels of review and detail the requirements of each level to accommodate for varying levels of complexity. The level of review should be commensurate with the complexity of the material and scientific questions involved.

[3] See FSH 1909.12, Chapater 40, 41.21
[4] See FSH 1909.12, Chapter 40, 41.21 and 41.22
[5] See FSH 1901.12, Chapter 40, 41.21 – Exhibit 01

Level 1 Informal Discussion—Level 1 is an informal discussion to solicit advice on the use of models, concepts, methods, or other tools in the planning process and to assure that all pertinent scientific literature is properly assessed and synthesized. This review should occur early on before a task or document is completed. A Level 1 review includes having a meeting or discussion to solicit review or input on materials. Resource specialists familiar with the applicable science information can provide Level 1 reviews and their input may be in the form of oral comments. Adjustments to the material are then made as appropriate. The minimum level of documentation for a Level 1 review includes a summary of the contact, the topic discussed, and the results of the interaction. Documentation may be kept with the supporting documents.

Level 2 Informal Review—Level 2 is an informal review of models, concepts, methods, or draft documents or products to assure that relevant science information is considered and reasonably interpreted and applied with consequences, uncertainties, and risks identified. This review should occur during or after the preparation of a draft document. A Level 2 review includes sending materials to individuals for review, or hosting a meeting to solicit review or input on materials. Forest resource specialists or regional specialists familiar with the applicable science information can provide Level 2 reviews and their input may be in the form of oral or written comments The minimum level of documentation includes a summary of the science questions asked, who provided the review, and a summary of the review and results. Documentation may be kept with the supporting documents.

Level 3 Formal Review—Level 3 is a more formal review and should be utilized when emerging science is involved or there is data insufficiency or a higher level of uncertainty, risk, or controversy about the information being reviewed. It involves the review of models, concepts, methods, or draft documents or products to assure that relevant science information is considered and reasonably interpreted and applied with consequences, uncertainties, and risks identified among plan components. This review should occur after the preparation of a draft document. A Level 3 review includes a more formal process of sending materials to individuals along with a written request for review Input from reviewers should be in the form of written comments. The Responsible Official then responds to the reviewer comments. Regional or national subject matter experts familiar with the applicable science information, including Forest Service research scientists or external scientists and science organizations can provide Level 3 reviews. The minimum level of documentation includes detail on the science questions asked, who provided the review, a summary of the review, and the responses to reviewer comments. Documentation should be part of the plan set of documents.

Level 4 Formal, Structured Review—Level 4 is a formal structured review and should be utilized when emerging science is involved or there is data insufficiency or a higher level of uncertainty, risk, or controversy about the information being reviewed. It involves the review of models, concepts, methods, or draft documents or plans to assure that relevant science information is considered and reasonably interpreted and applied with consequences, uncertainties, and risks identified among plan components. A Level 4 review includes a formal review process such as the "Science Consistency Review" (Guildin, et al 2003[6]). This type of review is more complex and involves the review team providing their review in the form of a

[6] See U.S. Department of Agriculture, Forest Service. 2003. The Science Consistency Review: A Tool to Evaluate the Use of Scientific Information in Land Management Decision Making. FS-772.

report. Regional or national subject matter experts familiar with the applicable science information, including Forest Service research scientists or external scientists and science organizations can provide Level 4 reviews. The minimum level of documentation required is outlined in "The Science Consistency Review" (Guildin et al. 2003) and includes a formal report from reviewers with findings, conclusions, and a cover letter. A formal reconciliation letter outlining how managers incorporated review comments is required. Documentation should be part of the plan set of documents.

Reviewers

There are various types of reviewers that meet the requirements for the different levels of science review. The requirements for reviewers are outlined in FSH 1909.12, Chapter 40, 41.23. All reviewers must have 1) expertise, 2) credibility, and 3) be independent from the planning process. A reviewer is not required to have an advanced degree but they must have the knowledge needed to adequately review the subject matter requested. Reviewers can be Forest Service research scientists, university faculty members, scientists associated with other groups or agencies, or Forest Service staff or technical specialists not associated with the particular unit under review. Reviewers can also be experts or scientists from consulting firms, private companies, or nongovernmental organizations. To avoid the perception of a biased review, the collection of reviewers should be independent with balanced viewpoints.

Factors to Consider in Selecting the Level of Science Review

In determining what level of review is needed for a particular facet of the planning process, a variety of factors need to be considered. These factors are outlined in FSH 1909.12, Chapter 40, 41.21 – Exhibit 02 and include State of Knowledge, Data Availability, Controversy, Risk, and Spatial and Temporal Scales of Issue. It is up to the Responsible Official to weigh the factors and determine the appropriate level of science review at any point during the planning process. It is anticipated that the majority of science review will occur at Levels 1 and 2, and that Level 3 and 4 reviews will be rare. At the forest level, the determination of level of science review needed shall be coordinated with other forests and with the regional science review processes.

Development of Science Questions

The Responsible Official should develop science questions that are appropriate for the nature of the content under review. These questions set the sideboards to facilitate the review. Review questions should focus on validating the use, acknowledgement, and documentation of science in the analysis or decision. The science questions should be framed to identify a specific facet of the planning process or documentation that needs review. The greater the focus of the question, the easier it will be to focus and contain the scope of the review. Below is a list of some appropriate example review questions as outlined in FSH 1909.12, Chapter 40, 41.22. These are example questions only and are designed to show the types of questions that may be asked during a science review.

Example Science Review Questions

1. Is the breadth and depth of the scientific information in the planning documents thorough enough to include the scientific consensus as well as any contradictory or conflicting views?
2. Are the sources of information referenced and synthesized adequately?
3. Are the citations accurate, credible, and appropriately used?
4. Is the documentation of how the scientific information was taken into account objective, useful, relevant, and with integrity?
5. Are the inferences drawn from the science information sound?
6. Is uncertainty in the scientific information acknowledged, adequately disclosed, and appropriately described?
7. Are unplanned disturbances, that may cause a departure from desired condition, identified appropriately?
8. Has scientific information been taken into account to identify and assess the likelihood that the desired conditions and objectives will contribute to sustainability?

The review should avoid asking questions that seek the opinion of scientists on components of the plan decision or seeking scientist approval for the use of science. Science reviews need to remain impartial on the nature of the plan decisions. Questions should not be posed to invite a deviation from such impartiality.

Literature Cited

Guldin, James M.; Cawrse, David; Graham, Russell; Hemstrom, Miles; Joyce, Linda; Kessler, Steve; McNair, Ranotta; Peterson, George; Shaw, Charles G.; Stine, Peter; Twery, Mark; and Walter, Jeffrey. 2003b. The science consistency review: A tool to evaluate the use of scientific information in land management decisionmaking. United States Department of Agriculture Forest Service. FS-772.

36 CFR 219.11 – National Forest System Land Management Planning, Role of science in planning

FSM 1920 – Land Management Planning, January 31, 2006

FSH 1909.12 – Land Management Planning Handbook, Chapter 40, January 31, 2006