CHAPTER 5. PRESENTATION OF EVALUATION RESULTS

5.1 INTRODUCTION

The first three chapters of this guidance presented techniques for the collection of information. Data analysis and interpretation are addressed in detail in Chapter 8 of EPA's *Nonpoint Source Monitoring and Evaluation Guide* (USEPA, 1996). This chapter provides ideas for the presentation of results.

The presentation of MM/BMP compliance evaluation results, whether written or oral, is an integral part of a successful compliance survey. The quality of the presentation of results is an indication of the quality of the survey, and if the presentation fails to convey important information from the compliance survey to those who need the information, the compliance survey itself might be considered a failure.

The quality of the presentation of results is dependent on at least four criteria—results must be complete, accurate, clear, and concise (Churchill, 1983). Completeness means that the presentation provides all necessary information to the audience in language that it understands; accuracy is determined by how well a researcher handles the data, phrases findings, and reasons; clarity is the result of clear and logical thinking and a precision of expression; and conciseness is the result of selecting for inclusion only that which is necessary.

Throughout the process of preparing the results of an MM/BMP compliance survey for presentation, it must be kept in mind that the survey was initially undertaken to provide information for management purposes—specifically, to help make a decision (Tull and Hawkins, 1990). The presentation of results should be built around the decision that the compliance survey was undertaken to support. The message of the presentation must also be tailored to that decision. It must be realized that there will be a time lag between the compliance survey and presentation of the results, and the results should be presented in light of their applicability to the management decision to be made based on them. The length of the time lag is a key factor in determining this applicability. If the time lag is significant, it should be made clear during the presentation that the situation might have changed since the survey was conducted. If reliable trend data are available, the person making the presentation might be able to provide a sense of the likely magnitude of any change in the situation. If the change in status is thought to be insignificant, evidence should be presented to support this claim. For example, state that "At the time that the compliance survey was conducted, forest harvesters were using BMPs with increasing frequency, and the lack of any changes in program implementation coupled with continued interaction with forest harvesters provides no reason to believe that this trend has changed since that time." It would be misleading to state "The monitoring study indicates that forest harvesters *are* using BMPs with increasing frequency." The validity and force of the message will be enhanced further through use of the active voice (*we believe*) rather than the passive voice (*it is believed*).

Three major factors must be considered when presenting the results of MM and BMP

implementation studies: (1) identifying the target audience, (2) selecting the appropriate medium (printed word, speech, pictures, etc.), and (3) selecting the most appropriate format to meet the needs of the audience.

5.2 AUDIENCE IDENTIFICATION

Identification of the audience(s) to which the results of the MM and BMP implementation study will be presented determines the content and format of the presentation. For the results of implementation monitoring studies, there are typically six potential audiences:

- Interested/concerned citizens
- Forest land owners and harvesters
- Media/general public
- Policy makers
- Resource managers
- Scientists

These audiences have different information needs, interests, and abilities to understand complex data. It is the job of the person(s) preparing the presentation to analyze these factors prior to preparing a presentation. The four criteria for presentation quality apply regardless of the audience. Other elements of a comprehensive presentation, such as discussion of the objectives and limitations of the study and necessary details of the method, must be part of the presentation and must be tailored to the audience. For instance, details of the sampling plan, why the plan was chosen over others, and the statistical methods used for analysis should be recorded even if they are not part of any presentation of results because of their value for future reference when the monitoring is repeated or similar studies are undertaken, but they are best not included in a presentation to management.

5.3 PRESENTATION FORMAT

Regardless of whether the results of a monitoring study are presented in writing or orally, or both, the information being presented must be understandable to the audience. Consideration of who the audience is will help ensure that the presentation is particularly suited to the audience's needs. Selection of the correct format for the presentation will ensure that the information is conveyed in a manner that is easy to comprehend.

Most reports will have to be presented in both a written and an oral form. Written reports are valuable for peer review, public information dissemination, and future reference. Oral presentations are often necessary for managers, who usually do not have time to read an entire report, have need for only the results of the study, and are usually not interested in the finer details of the study. Different versions of a report—for the public, scientists, and managers (i.e., an executive summary)—might well have to be written, and separate oral presentations for different audiences—the public, farmers, managers, and scientists at a conference—might have to be prepared.

Most information can most effectively be presented in the form of tables, charts, and diagrams (Tull and Hawkins, 1990). These graphic forms of data and information presentation can help simplify the presentation, making it easier for an audience to comprehend than if explained exhaustively with words. Words are important for pointing out significant ideas or findings, and for interpreting the results where appropriate. Words should not be used to repeat what is

already adequately explained in graphics, and slides or transparencies that are composed largely of words should contain only a few essential ideas each. Presentation of too much written information on a single slide or transparency only confuses the audience. Written slides or transparencies should also be free of graphics, such as clever logos or background highlights—unless the pictures are essential to understanding the information presented—since they only make the slides or transparencies more difficult to read. Examples of graphics and written slides are presented in Figures 4-1 through 4-3.

Different types of graphics have different uses as well. Information presented in a tabular format can be difficult to interpret because the reader has to spend some time with the information to extract the essential points from it. The same information presented in a pie chart or bar graph can convey essential information immediately and avoid the inclusion of background data that are not essential to the point. When preparing information for a report, a researcher should organize the information in various ways and choose that which conveys only the information essential for the audience in the least complicated manner.

5.3.1 Written Presentations

The following criteria should be considered when preparing written material:

- *Reading level or level of education* of the target audience.

- *Level of detail necessary* to make the results understandable to the target audience. Different audiences require various levels of background information to fully understand the results of a study.

- *Layout*. The integration of text, graphics, color, white space, columns, sidebars, and other design elements is important in the production of material that the target audience will find readable and visually appealing.

- *Graphics*. Photos, drawings, charts, tables, maps, and other graphic elements can be used to effectively present information that the reader might otherwise not understand.

5.3.2. Oral Presentations

An effective oral presentation requires special preparation. Tull and Hawkins (1990) recommend three steps:

1. Analyze the audience, as explained above.

2. Prepare an outline of the presentation, and preferably a written script.

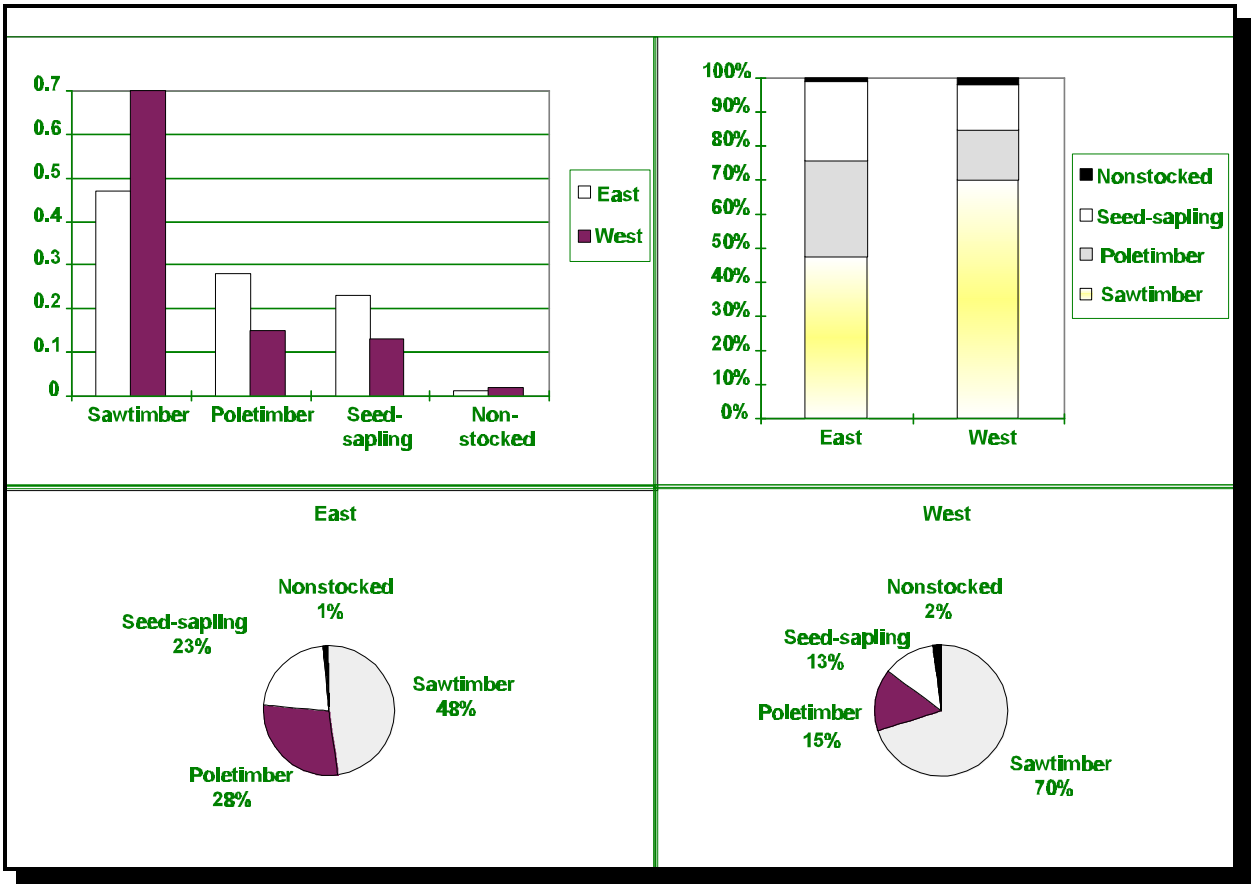

Figure 5-1. Timberland area by stand size class, East and West, 1992, represented graphically in three ways. (After Powell et al., 1994)

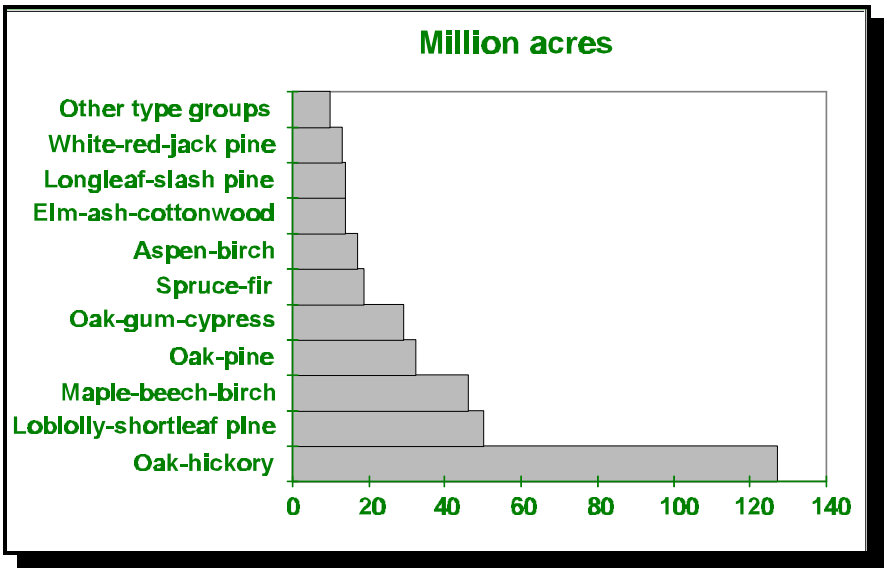

Figure 5-2. Forest type groups on unreserved forest land in the East, 1992, represented graphically. (After Powell et al., 1994)

FOREST LAND AREA

- Increased 0.1% between 1987 and 1992
- 33% of U.S. land area (737 million acres)
- Clearing forests for agriculture largely halted by 1920
- 34% is federally owned
- 6% is reserved from commercial harvest (47 million acres)

Figure 5-3. Example written presentation slide.

3. Rehearse the presentation. Several dry runs should be made, and if possible the presentation should be taped on a VCR and analyzed.

These steps are extremely important if an oral presentation is to be effective. Remember that oral presentations of ½ to 1 hour are often all that is available for the presentation of the results of months of research to managers who are poised to make decisions based on the presentation. Adequate preparation is essential if the oral presentation is to accomplish its purpose.

5.4 FOR FURTHER INFORMATION

Providing specific examples of effective and ineffective presentation graphics, writing styles, and methods of organization is beyond the scope of this document. A number of resources that contain suggestions for how study results should be presented are available, however, and should be consulted. A listing of some references is provided below.

- *The New York Public Library Writer's Guide to Style and Usage* (NYPL, 1994) has information on design, layout, and presentation in addition to guidance on grammar and style.

- *Good Style: Writing for Science and Technology* (Kirkman, 1992) provides techniques for presenting technical material in a coherent, readable style.

- *The Modern Researcher* (Barzun and Graff, 1992) explains how to turn research into readable, well-organized writing.

- *Writing with Precision: How to Write So That You Cannot Possibly Be Misunderstood*, 6th ed. (Bates, 1993) addresses communication problems of the 1990s.

- *Designer's Guide to Creating Charts & Diagrams* (Holmes, 1991) gives tips for combining graphics with statistical information.

- *The Elements of Graph Design* (Kosslyn, 1993) shows how to create effective displays of quantitative data.