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# Values, Beliefs, and Attitudes Technical Guide for Forest Service Land and Resource Management, Planning, and Decisionmaking

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## **Abstract**

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In recent years, the Forest Service and the public have placed increasing priority on making sure that management of public lands takes into account the needs of nearby communities, regional residents, national residents, and even members of the public who may not currently visit public lands. As awareness and commitment to this wide range of stakeholders grows, so does the need for forest managers and planners to understand the dynamic linkages among the forest, surrounding communities, and other stakeholders, including the national public. Knowing about public values, beliefs, and attitudes (VBAs) relevant to public land management is one foundation for understanding these linkages. Managers and planners aware of the systematic differences in values, beliefs, and attitudes held by the public and stakeholder groups are in a better position to define resource issues, develop alternative ways of addressing them, assess their social and cultural impacts, identify acceptable management measures, and monitor the results. The VBA technical guide is designed to acquaint Forest Service staff and line officers with the concepts of values, beliefs, and attitudes; to demonstrate ways in which VBAs and associated concepts can be measured and analyzed; and to suggest methods for applying VBA information to decisions about projects and plans.

**Keywords:** Attitudes, beliefs, values, qualitative research, quantitative research, human dimensions, stakeholders, social aspects of forest management.

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## Introduction

Values are important for managers to examine because they predispose attitudes and ultimately behavior...By understanding the forest values that people hold—whether as individuals or as political constituents, special interest groups, or activity user groups—forest planners and managers are better equipped to refine or establish policies, programs, and goals; mitigate potential conflicts among stakeholders; and plan effective implementation strategies [Tarrant and others 2003: 26].

*Effective resource management requires an understanding of public expectations and needs. An incomplete understanding of “what the public wants” undermines the goals of the agency and fosters tension between the public and the agency. As a result, social science research has become invaluable to the Forest Service in order to assess these questions. In the case of ecosystem management, questions include, “Who exactly is ‘the public’?” and “what does this public want?” Furthermore, is ecosystem management compatible with what the public wants? [Rogers 1996: 66].*

The human dimensions of federal wildland fire management are inextricably linked to public attitudes, values, and behaviors. How the general public (as well as specific publics such as stakeholders and interest groups) values resources and responds to federal wildland fire management activities can have a significant effect on fire management at the local, regional, and national levels. An understanding of public attitudes, values, and behaviors related to federal wildland fire management is essential and valuable [Machlis and others 2002: 167].

*Taken together, these papers paint a picture of a growing and vital area of research on the human dimensions of natural resources and the environment. Computer-aided text analysis is a powerful new set of tools that enable social scientists to explore in depth and detail the many attitudes, beliefs, values, motivations, and meanings related to natural resource issues [Bengston 2000: III].*

To effect a change in public attitudes and knowledge of fire and fire management in wildlands and adjoining areas, a concerted education and outreach program will be necessary. However, any programs designed to effectively change public attitudes will first require more in-depth knowledge of these attitudes and preferences [Bowker and others 2005: 3].

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*The findings of this study underscore the notion that the term “forest health” has important social dimensions, and that beliefs and opinions regarding forest health management must be made explicit. Members of the public possess a wide variety of views about what forest health threats are the most pressing and what actions are appropriate for achieving forest health. These views may differ widely from the forest health perceptions of land managers. Unless these various understandings are specifically explored, we can expect continued miscommunication as people use the same term, “forest health,” in reference to vastly different goals and expectations [Abrams and others 2005: 503].*

For decades, many have noticed that nonmarket values related to recreation, science, culture, and aesthetics are just as important as traditional, market-based values. As a result, conflicts are common among competing interests, and the values of different stakeholder groups are continuously changing. A shift to focus more on the importance of such values in forest management may help the manager to identify policy directions that benefit both natural resources and humans [Bright and others 2003a: 5].

This report provides guidelines for acquiring and using information about public and stakeholder values, beliefs, and attitudes (VBAs) in Forest Service land and resource management, planning, and decisionmaking. The use of VBAs contributes to sound planning and management decisions by national forest line and staff officers, planners, and National Environmental Policy Act (NEPA) coordinators. Such VBA information can help agency personnel to:

- Interact with the public.
- Understand what the public wants the agency to do and why.
- Prioritize and justify (or mitigate) potential actions.
- Develop and evaluate alternative ways to implement a decision.

This VBA technical guide is directed primarily to U.S. Department of Agriculture, Forest Service interdisciplinary teams, especially members working with the human dimensions aspects of a forest plan revision, NEPA project, or program planning process. The guidelines are fully applicable to other agencies that have responsibility for managing public lands or marine areas. Stakeholders—in this case, people who use or care about Forest Service management of public lands, including the public—also will find this report useful. After all, they are the ultimate customers; it is their values, beliefs, and attitudes that are being measured and considered.



The VBA technical guide is appropriate for readers whose skills range from “beginner” to “expert” in social science theory and methods. It should be useful at many levels of decisionmaking:

- District personnel wanting a better understanding of how people in local communities think about projects under consideration.
- Forest supervisors and staff working on forest plans and public involvement.
- Regional staff assigned to develop regional overviews or human dimensions sections of environmental impact statements.
- National leaders who can provide direction to local and regional efforts regarding measuring public VBAs and incorporating them into planning and management.

The VBA technical guide has several purposes: to acquaint Forest Service staff and line officers with the concepts of values, beliefs, and attitudes; to demonstrate ways in which VBAs and associated concepts can be measured and analyzed; and to suggest methods for applying VBA information to decisions about projects and plans.

We do not expect that, after reading the VBA technical guide, non-social-scientists will be able to design surveys measuring VBAs or to serve as principal investigators on social research projects. However, the increased familiarity with VBAs should permit Forest Service personnel to structure their conversations with stakeholders to develop a better understanding of public values, beliefs, and attitudes regarding agency actions.

Readers should also be able to participate in analyses and discussions of public comments and other sources of information to better understand public VBAs and their application to forest planning and decisionmaking. Agency personnel also should be better able to understand the extensive VBA literature written by research station social scientists and others and to apply the results, thus helping to bridge the gap between research and management. Finally, readers should be in a better position to serve as contracting officer’s representatives for social assessments, social impact assessments, or other applied social science contracts involving collection and analysis of VBAs and related information.

We are not trying to develop new social scientists, but to increase the capacity of staff and line officers to understand and incorporate public VBAs into all levels of planning and decisionmaking activities.

The VBA technical guide consists of eight sections, plus an appendix. The first two sections explain the guide’s purpose and why land managers should consider

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and incorporate public values, beliefs, and attitudes into their decisions. Then, a section defines the terms “values,” “beliefs,” and “attitudes” in detail, describes how they fit into behavioral frameworks, and provides examples of how they have been measured. The next section shows how to extract values, beliefs, and attitudes from existing documents or materials, such as public comments. The following two sections describe primary data collection of VBAs, first using qualitative studies and then using quantitative studies. These approaches are presented separately to emphasize the benefits of each, although when possible, researchers use multiple sources of VBA data to ensure the reliability and validity of the information. Another section describes critical issues and protocol associated with implementing any type of VBA study. Finally, the last section provides guidance on how to document VBA information and apply it to planning and management activities; for VBA information to be useful, it not only has to be available, but planners and managers must be aware of it and know how to apply it. The appendix includes an example of an interview guideline for qualitative research.

## **Purpose and Overview**

In recent years, the Forest Service and the public have placed increasing priority on making sure that management of public lands takes into account the needs of nearby communities, regional residents, national residents, and even members of the public who may not currently visit public lands. As awareness and commitment to this wide range of stakeholders grows, so does the need for forest managers and planners to understand the dynamic linkages among the forest, surrounding communities, and other stakeholders, including the national public.

Knowing about public values, beliefs, and attitudes (VBAs) relevant to public lands management is one foundation for understanding these linkages. Having a sense of the range and type of public VBAs helps us to correctly interpret behaviors we see on the national forests and during the planning process. Agency personnel regularly receive and evaluate information about public VBAs through a variety of means: conversations with members of the public; public meetings; field studies; and formal public comments and responses involving a National Environmental Policy Act (NEPA) process.

Less common, however, have been efforts to measure VBAs and incorporate them into Forest Service decision processes in a systematic manner. The VBA technical guide is one tool in the agency toolbox to help the agency and its collaborators work across agency and administrative boundaries to accomplish the common goal of providing for healthy, productive lands, and sustainable public benefits.

Values, beliefs, and attitudes are important components of what is known as human dimensions information, which has assumed increased importance as the agency has adopted an ecosystem-based approach to forest management:

There is a growing emphasis on the science of human participation in ecosystem processes. Integrating social science information into the decision-making process and weighing it equally with information from the biological and physical sciences produces balanced solutions. Human dimensions inquiry has been described as seeking to understand the human demands on, values and perceptions of, and interactions with ecosystems; and a means of integrating those into ecosystem-related policy, programs, and management (Bright and others 2003a).

**Values:** relatively enduring conceptions about the important principles of life, such as what is good or bad and desirable or undesirable; people in a given society or culture share values as well as beliefs. As used here, values also refer to people's orientations to nature and public lands management, specifically what types of public land opportunities or benefits are viewed as the most desirable.

**Beliefs:** judgments about what is true or false—what attributes are linked to a given thing. Beliefs can be based on scientific information, feelings and intuition, or cultural norms. As used here, the term refers to an individual or group's beliefs about the agency, about conditions of land and resources it manages (including causes of change in those resource conditions), and about the consequences of agency actions.

**Attitudes:** learned tendencies to react favorably or unfavorably to a situation, individual, object, or concept. As used here, attitudes indicate people's level of support for or opposition to agency actions, or indicate individual or group preferences for a certain activity or course of action.

Values, beliefs, and attitudes are only part of human dimensions information potentially available for making decisions. We are also interested in peoples' behavior—what they actually do when visiting or using Forest Service lands, as well as how they behave in other settings. We are interested in the history of a

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given community or population and its relationships to Forest Service lands and actions. We are interested in the demographic makeup of the population of stakeholders for a given Forest Service action, such as the types of communities associated with a forest and how residents would be affected by the action, or whether low-income or minority populations would be affected differently by agency actions. In most planning situations, we need to know about the local and regional economies, their relationship to management of the associated forest(s), and the level and type of peoples' economic dependencies on flows of benefits from the forest(s).

Other related and overlapping concepts that help in describing the human dimensions of natural resources and public lands include local knowledge, traditional environmental knowledge, ethics, morals, perceptions, and opinions. In some ways, VBA can be seen as a code word for this entire set of lenses through which people, alone and in groups, perceive and evaluate the world around them.

The VBA technical guide focuses on values, beliefs, and attitudes because they are critical in understanding public orientations to land use planning and management and because they have tended to be overlooked in Forest Service planning and management activities.

The goal is to describe the importance of this subset of social information and how to measure and incorporate it into land use and project planning. The goal is not to describe how to conduct social assessments or social impact assessments, or how to design and conduct social research. There are already ample sources for those purposes, for example:

- *Questions and Answers When Designing Surveys for Information Collections. Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), January 2006.* This document was issued as a memorandum for the President's Management Council, dated January 20, 2006. Its main value is its use in helping researchers prepare information collection submissions to OMB as required by the Paperwork Reduction Act of 1995. The Act requires any Federal agency information collection to employ effective and efficient survey and statistical methodologies appropriate to the purpose. It requires OMB approval of any collection of the same information from 10 or more individuals, a lengthy process described in greater detail later in this guide. However, the document also discusses choice of research methods, sampling procedures, the advantages and disadvantages of different methods of collecting information, questionnaire design and development, statistical

standards, confidentiality and informed consent procedures, response rates and the use of incentives, analysis and reporting issues, and a special section on stated preference questions (used to estimate economic value of nonmarket resources). This is a wealth of useful information prepared by the agency that will be reviewing your proposals.

- *A Human Dimensions Framework: Guidelines for Conducting Social Assessments* (Bright and others 2003a). This Southern Research Station publication contains a wealth of information directly applicable to acquiring and using VBAs. It begins with a set of principles and definitions for addressing human dimensions of ecosystem management and demonstrates how a social assessment is used to integrate the various types of information. It then proposes a framework for determining relevant characteristics of the social environment.
- *U.S. Principles and Guidelines for Social Impact Assessment* (Interorganizational Committee on Principles and Guidelines for Social Impact Assessment 2003); *A Community Guide to Social Impact Assessment* (Burdge 2004). These two publications address the goals and methods of social impact assessment—in this case, how we measure and display the effects of forest plans and projects from a social perspective. The first publication is strong on principles, and the second is more of a workbook that leads the planner through the various steps needed to conduct a social impact assessment at the community scale.
- *The Practice of Social Research* (Babbie 2006). This comprehensive text, now in its 11<sup>th</sup> edition, is an example of one of the many books on social research that cover every aspect of the research process, from formulation of the research idea and hypotheses, to selecting an appropriate research method, to analyzing and presenting the data. It is valuable not only for its descriptions of social research techniques, but for its discussions of the ethical and political aspects of social research, the structure of scientific inquiry, causal relationships among variables, and other issues related to research design and analysis.
- Web sites, such as the developing **HD.gov**, provide a compendium of literature, principles, and methods related to understanding, documenting, and applying information about the human dimensions of natural resources and public land and water management. Another example, specific to coastal and marine systems but very applicable to terrestrial settings, is the National Oceanic and Atmospheric Administration (NOAA) Coastal Service Center Web site, Applying Social Science to Coastal Management, [http://maps.csc.noaa.gov/socialscience\\_2/](http://maps.csc.noaa.gov/socialscience_2/), and a companion site, Social Science Methods for Marine

Protected Areas, <http://www.csc.noaa.gov/mpass/>. These sites are designed with the non-social-scientist in mind, so they contain easy-to-understand explanations of research and techniques available to study VBAs and other social variables.

Instead of trying to be a step-by-step primer on social research methods, the VBA technical guide focuses on the special methodological considerations and principles associated with measurement and use of VBAs. The services of a consultant, local university, or agency expert will usually be required to design and conduct a series of interviews with stakeholders in a way that will be defensible, to lead a series of focus groups addressing topics of interest to forest planners, or to design and conduct a survey to assess VBAs present in a population of interest.

There are some less-technical types of VBA analyses described in the guide that could be done by a variety of non-social-scientists, such as analyzing public comments to understand VBAs or asking about VBAs in regular communications with the public, and we believe their use is appropriate. For other analyses, we outline the primary options for collecting VBA information, describe their advantages and disadvantages, discuss issues associated with their implementation, and refer the reader to sources for more information.

First, however, we need to describe why VBAs require a technical guide. This is important because many managers and planners remain unconvinced that VBAs have a role in the decision process, or can be measured systematically using scientific methods. Even if VBA information is available, planners may struggle with how to apply it. The following section demonstrates how VBAs are a critical component of the human dimension of natural resources and public lands management—and why planning processes must consider them.

## **Why Values, Beliefs, and Attitudes Matter**

Managers and planners aware of the systematic differences in VBAs held by user or stakeholder groups are in a better position to define resource issues, develop alternative ways of addressing them, assess their social and cultural impacts, identify a preferred alternative, and monitor the results. Information on VBAs has value during each phase of the planning process.

Even for those unfamiliar with acquiring and using VBAs, it should not be difficult to understand their importance and role in natural resource management. Consider for example, the familiar concept of culture. We know that individuals are shaped by their culture—they are members of larger groups that have things

in common. Most definitions explain culture in terms of the shared values, beliefs, and attitudes held by its members to explain their view of the world. Thus, understanding VBAs is key to understanding people's orientations to national forests and the Forest Service.

One important aspect of the 10<sup>th</sup> International Symposium on Society and Resource Management, held in Keystone, Colorado, in June, 2004, was development of a text summarizing knowledge available to the field (Manfredo and others 2004). The volume includes many studies describing various populations' VBAs concerning natural resources and their management.

The concept of attitude has been one of the most pervasive topics not just in social psychology, but in the human dimensions of natural resources (Manfredo and others 2004). Attitudes have been measured not just to help describe the views of different stakeholder groups or types of recreation visitors, but to predict behavior and test hypotheses about relationships among values, beliefs, attitudes, and behavior.

Values have also been studied extensively in the human dimensions of natural resources (Manfredo and others 2004). Many human dimensions researchers have adopted Rokeach's definition of values as "basic, evaluative beliefs about appropriate modes of conduct and desired end states" (Manfredo and others 2004: 275). Note that this definition of values also incorporates the evaluative element of attitudes. Values can help to explain stakeholders' "desired future conditions" of forest resources and their uses, as well as preferences for methods of achieving those conditions.

As we will see when VBAs are explained in detail, their primary utility comes from understanding them as part of a broader behavioral system. When an attitude toward an agency action is expressed, it is often viewed as a vote for or against the action; what we really want to understand is why someone favors or opposes the action. Those underlying causes provide opportunities for education, for development of new alternatives, for explaining why an action is preferred. Values and beliefs are not always the basis for attitudes, but they typically play a role.

The following sections demonstrate how VBAs are a critical component of public land management.

## **Social Assessments**

Social assessments are descriptions of the human environment relevant to a Forest Service project or plan. The purpose of a social assessment is to characterize the social and economic environment of a National Forest System unit by showing

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the relationship and linkages between National Forest System land and the social organizations (counties, towns, communities) most closely tied to those lands. It is best applied at the early stages of forest planning and in the pre-NEPA stages of project work. The assessment typically forms the basis for the Environmental Impact Statement's (EIS's) human dimensions section of the affected environment chapter, but also feeds into issue identification, analysis of the management situation, and development of alternatives.

Assessments are intended to help the Forest Service and the public (1) better understand the relationship between public lands and communities, (2) aid in identifying specific elements of the current forest plans that may need to be changed, and (3) assemble the information needed to evaluate tradeoffs between options for future forest management. The goals for a social assessment are therefore similar to those of VBA studies, but the information used in a social assessment usually is compiled from secondary sources such as the U.S. census and the Bureau of Economic Analysis. A social assessment highlights a forest's unique position and clarifies its role in and key contributions to the local community, the state, and the Nation. It may use previously acquired VBA information along with other sources to do so.

A social assessment should be broadly useful to the forest and the public as a basis for well-informed consideration of future alternatives within and beyond the planning process.

The Forest Service training course *Social Analysis for Planning and Decisionmaking* offers guidance on the selection of variables for a social assessment, using the acronym SALLED; this listing shows how VBA information is a necessary—but not sufficient—component of the social setting and environment:

- Social organization
- Attitudes, beliefs, and values
- Lifestyles
- Land use
- Economy
- Demographics

Furthermore, VBA information is especially well-suited to help describe the public and stakeholder groups associated with a forest. The U.S. census, the Economic Profile System (EPS) and other existing sources of demographic information tell us much about a population and the well-being of its members. However, too many social assessments have relied on demographics to describe the



surrounding population simply because that information is current and readily available. Yet it can also be devoid of meaning relative to the forest, how forest resources and opportunities are used by that population, their attitudes toward current and future management, and what they value about forest opportunities and benefits. This richness that characterizes peoples' relationships with the forest is obtainable only through collecting information centered on peoples' experiences and their associated values, beliefs, and attitudes. For example, the Forest Service has conducted public surveys including VBA variables to assist with its strategic planning (Shields and others 2002).

## Social Impact Assessment

Social impacts are defined as:

The consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society [Interorganizational Committee on Principles and Guidelines 2003].

In our context, social impact assessment (SIA) is the identification, analysis, and presentation of the social impacts associated with Forest Service actions, as described in an environmental assessment (EA) or an EIS. Social impact assessment is a method of gauging the social consequences of alternative management actions or policies. The purpose and logic of the SIA is the same as for other elements of environmental impact analysis and assessments:

- To determine (social) conditions in areas or (human) populations likely to be affected by the action or policy (if a social assessment exists, it provides this type of information).
- To project future (social) effects of continuing the status quo.
- To estimate social effects that will result at local, regional, and national scales if the management alternative is implemented.

Two subcomponents of SIA include the Civil Rights Impact Analysis (CRIA) and Environmental Justice (EJ) Analysis. Although they differ in their sources of requirements (the Civil Rights Act and the Executive Order on Environmental Justice, respectively), both of these analyses look for disproportionate impacts specific to minority or low-income populations.

Value, belief, and attitude information is necessary to estimate the effects of forest plan allocations and changed opportunities on populations of interest. Information on VBAs is critical to the process of social impact assessment, which requires not just identifying changes in the human environment, but describing the **meaning** of those changes to affected populations. It is difficult if not impossible to evaluate impacts to social well-being or quality of life without describing the values, beliefs, and attitudes that define and determine quality of life (Allen 2000, Burdge 2004). Much of this work takes place at the community level; community residents and leaders are always concerned about changes in forest plans and activities that will affect the quality of life in their communities.

Having information about the VBAs of stakeholders and the public also makes it possible to explain alternatives and their social effects in terms that are meaningful to stakeholders. Perhaps a stakeholder group's opposition to a management alternative is grounded in mistaken beliefs about the prevalence of a technique relied on by the alternative, or its effects on the landscape. We can discuss the belief and explain why it is unfounded as part of the SIA. Another common occurrence is that people oppose an action because they believe it will have dire consequences. If we have a systematic understanding of the belief and why people feel that way, we can search for case studies of similar activities, and present data relevant to peoples' beliefs.

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**Social acceptability refers to public judgments about the appropriateness of a given management practice or environmental condition.**

### Social Acceptability

Social acceptability refers to public judgments about the appropriateness of a given management practice or environmental condition. Policies and practices lacking social acceptance and approval may ultimately fail (Shindler and others 2002). Acceptability clearly has an attitudinal component because it involves an **individual** making a favorable or unfavorable judgment about, say, fire management practices, timber harvest levels or locations, or off-road vehicle management. **Social** acceptability also has this evaluative component, but reflects **social norms** or levels of agreement about those management practices.

Brunson (1996) offered a deeper definition that captures the complexities involved:

Social acceptability in forest management results from a judgmental process by which individuals (1) compare the perceived reality with its known alternatives; and (2) decide whether the "real" condition is superior, or sufficiently similar, to the most favorable alternative condition. If the

existing condition is not judged to be sufficient, the individual will initiate behavior—often, but not always, within a constituency group—that is believed likely to shift conditions toward a more favorable alternative.

This definition is interesting in the context of the VBA technical guide for several reasons. The judgmental process is clearly an attitude, yet one that has a behavioral component; if an individual views a practice or condition as unacceptable (a type of negative attitude), he or she will be more likely to take action that is believed to lead to a more desirable outcome. The definition also mentions that the behavior is likely to take place within a constituency group, suggesting that this group and social norms play a role in an individual's judgment process.

Another interesting facet of social acceptability is that acceptability varies by situation and context; in other words, it is highly individual and difficult to predict. For example, practices and conditions are judged in a geographic context; an example of this is the NIMBY (not in my backyard) syndrome (Brunson 1996). A practice judged acceptable in general may be viewed as unacceptable if it is being implemented close to one's residence or to a place on the forest to which someone is attached.

It cannot be assumed that increasing someone's level of education or knowledge about a topic will lead to a different judgment regarding acceptability, because judgments are informed by a variety of factors in addition to science, including personal experience and knowledge, ethical concerns, and "values, attitudes, and beliefs" (Stankey 1996).

Social acceptability matters to resource managers because they can fail even if they are attempting to use the best available science, implemented carefully, if they are not successful in engaging their stakeholders—also known as voters and political animals. The history of natural resource management is replete with examples where natural resource policies that proved unpopular were not only amended, but recognized as inappropriate and damaging:

Decisions that fail to adequately account for public values are unlikely to succeed, if they are implemented at all...however...learning is a key element of the acceptability process. Thus, as we consider social acceptability and its relation to management and decision-making, it can be seen as an opportunity for discussion, debate, and learning about the complex dimensions of the issue at hand [Shindler and others 2004: 153–154].

This statement reflects another characteristic of attitudes, and one that has perhaps inspired more applied research than any other—the idea of attitude change

which, to many, means the opportunity for persuasion. This should not be equated with the goal of learning people’s attitudes, beliefs, or values about natural resource management only so that we know how to change them. The above quote suggests that, rather than one-way education, mutual learning should be the goal. We cannot address social acceptability without measuring attitudes—and for more complete understanding we also need information about why a condition or practice is viewed as acceptable (values) and what set of beliefs is associated with those practices or conditions.

## Fire Management

Machlis and others (2002) developed a social science research plan for federal wildland fire management that incorporated a policy analysis, literature review, needs assessment, and research agenda. The research agenda was designed to provide usable knowledge to federal managers and their partners; usable knowledge was defined as relevant, timely, and defensible information that managers can use in making decisions, planning, evaluating programs, and solving problems. The research agenda was categorized by several major topics that demonstrate the range of issues that could benefit from increased understanding:

- Social, economic, and cultural variables as contributing factors to wildland fire.
- Social, economic, and cultural impacts of wildland fire.
- Firefighter health and safety.
- Public health and safety related to wildland fire.
- Organized capacity, decisionmaking, and coordination.
- Public values, attitudes, and behaviors.
- Pathways of public communication related to wildland fire.

The authors were emphatic about the importance and utility of the “public values, attitudes, and behaviors” problem area:

The human dimensions of federal wildland fire management are inextricably linked to public attitudes, values and behaviors. How the general public (as well as specific publics such as stakeholders and interest groups) values resources and responds to federal wildland fire management activities can have a significant effect on fire management at the local, regional, and national levels. An understanding of public attitudes, values, and behaviors

related to federal wildland fire management is essential and valuable [Machlis and others 2002: 167].

They identified four main areas of research under the “public values, attitudes, and behaviors” problem area:

- Developing a comprehensive understanding of public values, attitudes, and behaviors.
- Understanding public preferences related to federal wildland management.
- Understanding relationships with key publics through ethnographic research.
- Understanding the history of communities at risk.

This agenda suggested that VBAs associated with fire should be understood using both quantitative (“comprehensive understanding of public...”) and qualitative methods (ethnographic research), and that additional information (“history of communities at risk”) was needed to complement information on VBAs. Fire management, like other forest issues, is a multidimensional issue that requires many ways of knowing. Values, beliefs, and attitudes information is a critical component of the socioeconomic dimension of fire management, but must be supplemented by other information to tell the whole story.

One project synthesized results from a set of research studies to demonstrate the utility of VBA information:

As the October 2003 fires in Southern California clearly demonstrated, a critical component of the current wildfire problem in the United States is the growing number of people living in high fire hazard areas. The active involvement of the public will be central to efforts to mitigate the wildfire hazard... Topics explored include what influences homeowner willingness to mitigate wildfire hazard on their property, what elements make prescribed fire and mechanical thinning more or less acceptable fuels management practices, how different demographic characteristics shape beliefs, and how the public responds to post-fire restoration efforts. Findings from the studies, which are ongoing, will provide fire managers, planners, and educators at the national, state, and local level with useful guidelines about the most effective means of fostering public support for and participation in pro-active fire management activities [McCaffrey 2006].

## Sense of Place

Sense of place is a topic particularly well-suited for studies of VBAs. Sense of place refers to the human connections to place—an entire range of cognitions and affective sentiments held about a particular geographic location and the resulting meanings of that location to people (Farnum and others 2005). Forest Service planners and managers already know that people can value the same piece of land in very different ways—this is typically a source of conflict over public land management. We intuitively understand that a given piece of land does not mean the same thing to all people. People look at that piece of land or water through their individual, social, and cultural lenses:

Place is not an inert physical container for biophysical objects and human actions. Places are, in and of themselves, social constructs that defy ready definition, categorization, and measurement. Each place has a unique history among its inhabitants and visitors [Cheng and others 2003].

Place attachment, which may be especially strong for local community residents and repeat forest visitors, contains an emotional component that can really only be measured by talking to people about how they perceive certain places. These emotional components could be viewed as combinations of values and attitudes. Sense of place has also been measured by studying place names. It is not unusual for different groups of people to have different names for the same place; by learning about these names and their origins, managers have a better understanding of the meanings of that place to the different groups.

Although sense of place is typically discussed for specific locations, it is also a useful concept at a broader ecosystem scale and can therefore be incorporated into broad ecosystem planning efforts such as the Interior Columbia Basin Ecosystem Management Project (Galliano and Loeffler 1999).

However fascinating the topic, it is not the intent here to explore the entire literature on sense of place and place attachment; this was recently done and documented in a Forest Service report (Farnum and others 2005). However, it should be clear that it is impossible to understand sense of place without studying the values people have toward places on the forest, what they believe about those places, and their attitudes toward possible management actions that could affect those places.

The complexity and holistic nature of sense of place and place attachment do not lend themselves to simple descriptive statistics (Farnum and others 2005). That

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**It is impossible to understand sense of place without studying the values people have toward places on the forest, what they believe about those places, and their attitudes toward possible management actions that could affect those places.**

is why many researchers have adopted qualitative approaches to studying sense of place. Forest Service researcher Herbert Schroeder (1996, 2004) has conducted a series of qualitative studies to obtain information about sense of place for use in forest planning. For example, he used an open-ended, qualitative survey to identify “special places” within the Black River area of the Ottawa National Forest on Michigan’s Upper Peninsula, and to learn what kinds of experiences and environmental features were related to strong feelings for these places.

Sense of place, or the values people attach to specific landscape locations, can also be studied in a more quantitative manner. Greg Brown, Pat Reed, and colleagues, for example, have successfully mapped public values associated with specific places on public lands (Brown and Reed 2000).

## Human Dimensions of Wildlife and Fish Management

Values, beliefs, and attitudes are also emphasized in the literature on the human dimensions of wildlife management. In fact, a key contribution of social science to wildlife management has been to identify the values, attitudes, norms, and motivations of different segments of the public (Decker and others 2004). Studies have been conducted on public values regarding wildlife and their management, attitudes toward wildlife management alternatives, the role of social norms in determining both attitudes and behavior, and recreation visitors’ motivations and factors affecting satisfaction.

Fish and wildlife managers have developed a better understanding of the behavior and management preferences of hunters, fishermen, and wildlife viewers as a result of research measuring VBAs. They have been in a better position to design wildlife management options, evaluate their effects, and communicate with the public as a result of understanding the market segments of fishermen and hunters—a task that would be difficult if not impossible without measuring VBAs.

One study of several wildlife user groups (Tarrant and others 1997) explored the links among attitudes, values, and knowledge, finding that attitudes toward wildlife species protection reflected environmental values, general attitudes toward the environment, and levels of knowledge regarding wildlife. However, these relationships were not generalizable to all groups of wildlife users. For example, increased knowledge reduced the effect of values on specific attitudes for combined consumptive/nonconsumptive user groups. The authors believed it made sense that people who participated in both consumptive and nonconsumptive wildlife activities relied more on knowledge than values to form specific attitudes about wildlife,

because they may have held conflicting values about wildlife activities, and therefore sought to reduce cognitive dissonance by relying more heavily on knowledge to form their attitudes. This example illustrates the importance of not relying on attitude measures alone to measure public opinion, but to incorporate other types of VBAs and behavioral information.

### Limits of Acceptable Change Planning

The Limits of Acceptable Change (LAC) process for managing recreational use impacts in wilderness and other natural settings (Stankey and others 1985) provides another example of the critical role of VBAs. The LAC process is one of the better examples of how social norms regarding acceptable conditions (or unacceptable conditions) can be measured and used to develop and choose among management alternatives. Thus LAC depends on beliefs (such as whether a certain set of management actions will produce a certain outcome); values (such as evaluations of whether that outcome is desirable based on one's orientation to the resource), and attitudes (such as whether an individual favors or opposes a regulation desired to produce the outcome).

Researchers have found that, in wilderness and a variety of outdoor recreation settings, members of groups tend to agree on what conditions are acceptable or unacceptable in order to have a satisfactory experience. Measurements such as the number and type of other visitors, the presence of certain types of site modifications, evidence of past users, and the level and type of management presence can all play a role in the acceptability of a given recreation setting. Different groups, such as anglers floating and fishing a river as a private party compared to commercially guided anglers, have different standards for what is acceptable.<sup>1</sup> These differences in judgments about acceptability, often grounded in differing values, are one reason why resource conflicts develop at the individual or social level (Graefe and Thapa 2004). Studies of perceptions of scenic beauty (Daniel and Schroeder 1979) also rely on attitude measures.

### Communication Planning

Values, beliefs, and attitudes play yet another critical role in agency efforts to design, deliver, and evaluate communication strategies with visitors, the general public, stakeholders, and others (Absher and others 2004). Much research has

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**Values, beliefs, and attitudes play yet another critical role in agency efforts to design, deliver, and evaluate communication strategies with visitors, the general public, stakeholders, and others.**

<sup>1</sup> Allen, S.D. 2004. Differences in motivations, experiences, and acceptability of resource and social conditions between guided and non-guided river anglers. [Presentation]. In: River Management Society 2004 Symposium; May 6, 2004; Lake Tahoe, CA.



been conducted to help design information programs, but some has also assessed the effects of information programs (the independent variable) on attitudes and behaviors (dependent variables); some information campaigns, such as Smokey the Bear, have been so influential that they have led to development of or changes in values.

Studies of communication strategies frequently involve participants completing a questionnaire on knowledge about a topic (such as fire and fire management) and attitudes toward various fire management options, then exposing them to a source of information (such as a brochure), and retesting their knowledge and attitudes to see if they changed in a hypothesized direction. Some designs can be more sophisticated, such as randomly assigning groups to various versions of the brochure, or to a control group that did not read any of the brochures, before comparing the post-test to the pretest results for each treatment condition.

## **Public Involvement and Collaborative Planning**

Public involvement or collaborative planning activities are two ways to learn more about the VBAs of people affected by forest decisions and allocations. However, they are not a way to gain systematic information about a broader population's VBAs, which can only be achieved by a carefully designed study. The presence of such a study and its results will be a definite aid to collaborative planning efforts and to help guide public involvement activities.

Collaboration as required by the planning rule is desirable to reduce conflict between different groups in the public or between the Forest Service and the public. Conflict is a natural disagreement resulting from individuals or groups that differ in attitudes, beliefs, values, or needs. It can also originate from past rivalries and personality differences. Other causes of conflict include trying to negotiate before the timing is right or before needed information is available. Information on VBAs is therefore helpful in understanding and managing conflict. Collaboration is grounded in a specific set of values (Johnson and Johnson 1989, Slavin 1989). Participants that do not share those values (community, search for knowledge and truth, unity, and respect) can derail collaborative learning and decisionmaking.

When a forest collects VBA information as part of plan revision inventory and monitoring efforts, we expect the information on the range of public VBAs as they relate to specific issues to be helpful in reducing conflict. This information will enable agency staff to address concerns of all people along the range of VBAs and ensure that actions either address VBAs or explain why they will not or cannot. The collection of VBA information prior to public involvement can help set the stage

for understanding shared values and perhaps those areas where values are in conflict. Methods for mitigating value conflicts such as information sharing or even individual outreach to groups that may feel alienated may be more effective.

## Forest Service Internal Planning

The Forest Service has studied the values, beliefs, and attitudes not only of the public and stakeholders it serves, but of its own employees. The results of several studies demonstrate why the agency is interested in its own VBAs and how they change over time. One 1991 study conducted by the Pacific Northwest Research Station examined the values of Forest Service line officers (Cramer and others 1993). The sample results were stratified by role and level of experience (regional foresters/chiefs, experienced forest supervisors, new forest supervisors, experienced district rangers, and new district rangers). Although the line officers viewed timber as the agency's primary emphasis, they believed that the public placed higher value on wildlife and recreation than on timber and grazing as forest uses. Their own values more closely matched their perception of the public's values than their perception of the agency's emphases. The newer district rangers were the group most likely to have the lowest personal priority for timber management. The authors concluded:

The USFS line-officer sample supports a basic shift in the direction of national forest multiple-use priorities and environmental values. This is especially so among newly-appointed district rangers and is cause to reconsider the probable future influence of traditional commodity and resource development values previously observed among USFS district rangers...an evolutionary change is occurring within the USFS belief and priority system that is consistent with shifts in the values of the American public and legislation of the 1970s [Cramer and others 1993: 486–487].

Another study (Mohai and others 1994) described a survey of more than 1,800 Forest Service employees conducted by the University of Michigan's School of Natural Resources and Environment. The motivation for the study came from the authors' interest in how the agency is responding to rapidly changing social, economic, and other demands, and whether employees believed that the agency was headed in the right direction to deal with important contemporary issues. Note that by using the term "right" direction, the authors were not referring to a particular direction, but to however "right" was defined by the individual respondent.

The report cited several earlier studies of agency employees, noting that most had wanted to assess whether there was evidence of a shift in employee's values

that mirrored shifts observed in society, as demonstrated by public opinion polls, legislation, and other measures.

One hypothesis tested by Mohai and others (1994) was whether agency employees placed greater value on timber harvest and other commodity uses and values associated with national forests, and less value on preservation and nonconsumptive uses and values, compared to the public.

Some of the questions on the survey asked employees about their own preferences, so they were measuring attitudes: **“The agency should place less emphasis on multiple use development and more emphasis on preservation.”** (Respondents used a four-point scale ranging from “strongly agree” to “strongly disagree” to indicate the direction and strength of their attitudes).

Some questions asked employees whether they felt something was true or not, so they were measuring beliefs: **“Local economic concerns play too great a role in multiple use management decisions.”** (Respondents used a four-point scale ranging from “strongly agree” to “strongly disagree” to indicate the direction and strength of their beliefs).

Some questions asked employees to describe their moral/ethical positions regarding the environment; although one could refer to these as beliefs or as attitudes (or evaluative beliefs), they are clearly linked to basic values associated with the environment: **“Humans have the right to modify the natural environment to meet their needs.”** (Respondents used a four-point scale ranging from “strongly agree” to “strongly disagree” to indicate the direction and strength of their values).

The results suggested that a majority of both line and staff employees showed pro-environmental positions on most of these statements, although nearly all of these responses were in the “somewhat favorable” category rather than a “very favorable” category. Other questions found that most considered themselves “environmentalists” and had a favorable impression of environmentalists. However, a clear majority of the employees also believed that environmental groups had too much influence on Forest Service policy—although an even higher proportion believed that commodity interest groups had too much influence.

The authors compared the responses of many subgroups within the sample, to see if there were any consistent differences in the responses of men compared to women, line officers compared to staff, long-time employees compared to newer employees, discipline, race, grade level, and other variables that characterized the employees.

A 1996 study, replicating earlier research, compared environmental and resource management values between Forest Service employees who were members of AFSEEE (Association of Forest Service Employees for Environmental Ethics) and three groups of employees who were not members (Brown and Harris 2000). The authors were interested in studying the current resource management paradigm within the Forest Service. The authors defined paradigm as “the set of common values, beliefs, and shared wisdom that collectively provide the lens through which individuals in resource management professions form attitudes and upon which they base their actions.” The concept of paradigm thereby neatly combines values and beliefs, which are hypothesized as a predictor of both attitudes and behavior. The new paradigm, as represented by the views and numbers of AFSEEE employees, emphasized citizen participation, a balance of providing amenity and other noncommodity forest values, and protection of ecosystem functions and processes to maintain biodiversity, as opposed to production of goods and services. Researchers studying the American public had developed a similar set of questions called the New Environmental Paradigm scale, which was administered over time to detect similar trends for the public as a whole (Dunlap and Van Liere 1978).

The environmental orientations of the members and nonmembers still differed significantly—but the difference was less than that found by Brown and Harris in the earlier (1990) study. The findings suggested that,

Although a new resource management paradigm is being increasingly embraced by USFS employees in 1996, significant resistance to that new paradigm and frustration over forest management persists within the agency...recent employees values and beliefs indicate that frustration with the forest management deadlock has reached the point that the pendulum of employee preferences has begun to swing back, albeit slightly, toward commodity production and away from non-commodity values...[Brown and Harris 2000:17].

In summary, the values, beliefs, and attitudes of forest visitors, stakeholders, and the public (and, in some cases, of the Forest Service itself) have been studied extensively and applied in a variety of management decisions. This will become clear through a series of examples and guidelines on measurement of VBAs, their context in terms of the full set of information valuable for decisionmaking, and important considerations in their application.

## Definition of Values, Beliefs, and Attitudes

It should be clear that VBAs, in addition to having been defined many ways by researchers, are closely linked to other concepts—often depending on the particular behavioral framework of the researcher. The greatest utility stemming from knowing about VBAs is how they can tell a story when all three concepts are linked together; each can help to explain the other.

Rokeach's cognitive hierarchy has five components, defined below (Rokeach 1968, 1973). These components are central to the conceptual model known simply as VBA. Descriptions of how VBA information connects to—and informs—collaboration, planning, and NEPA processes follow the definitions.

**Values** are relatively general, yet enduring, conceptions of what is good or bad, right or wrong, desirable or undesirable.

**Beliefs** are judgments about what is true or false—judgments about what attributes are linked to a given object. Beliefs can also link actions to effects.

**Attitudes** are tendencies to react favorably or unfavorably to a situation, individual, object, or concept. They arise in part from a person's values and beliefs regarding the attitude object.

**Intentions** are convictions or aims to act in a certain way.

**Behaviors** are observable actions or activities people actually do that may or may not conform to their prior intentions.

The framework described in a series of articles by Fishbein and Ajzen (1975), the Theory of Reasoned Action, contains a similar set of concepts, but described somewhat differently and supplemented by additional variables:

**Attitude** is a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object...a person's attitude toward a given object is a function of his beliefs that the object has certain attributes and his evaluation of those attributes.

**Belief** links an object to an attribute...beliefs represent the information he has about the object... the subjective probability of a relation between the object of the belief and some other object, value, concept, or attribute.

**Behavioral intention** refers to a person's intentions to perform various behaviors... In many respects, intentions may be viewed as a special case of beliefs, in which the object is always the person himself and the attribute is always a behavior.

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**The greatest utility stemming from knowing about VBAs is how they can tell a story when all three concepts are linked together; each can help to explain the other.**

**Behavior** is the observable acts of the subject...questionnaire or verbal responses are also instances of overt behavior...Usually, however, such responses are not treated as records of behavior but are instead used to infer beliefs, attitudes, or intentions. Behavior...refer(s) to observable acts that are studied in their own right.

In their framework for the prediction of specific intentions and behaviors (fig. 1), beliefs are beliefs about the consequences of the behavior, and attitude is the attitude toward the behavior. Thus beliefs and attitudes are not directly toward the object—but toward performing the behavior. Two other important concepts are normative beliefs and subjective norm. Normative beliefs are the beliefs that certain referents think the person should or should not perform the behavior in question. Referents can be a variety of reference groups at a variety of scales—presumably some group of people whose views the individual values. The subjective norm, in turn, is this combination of (1) beliefs about the existence of social norms and (2) the individual's motivation to comply with those norms. This framework, as does more recent versions (Ajzen 2002) recognizes the importance of social, as well as psychological, reasons why someone performs or does not perform a specific behavior. Of course, it is also possible that we may infer our own attitudes or values by observing our behavior (Bem 1972).

Following is a more indepth description of how social scientists have conceptualized values, beliefs, and attitudes, with an emphasis on their application to natural resource and public land management. The VBA concepts described below are adapted for application to planning and NEPA processes from widely recognized sources. We will start with values and beliefs, because they are more commonly described as antecedents of attitudes. For each term we will provide measurement examples taken from the National Survey on Recreation and the Environment (NSRE 2000–2002).

## Values

Rokeach (1973) defined values as “core conceptions of the desirable within every individual or society.” He stated that values “serve as standards or criteria to guide not only action but also judgment, choice, attitude, evaluation, argument, exhortation, rationalization and one might add attribution of causality.” Examples of values commonly held as basic are freedom, security, social belonging, dignity, beauty, or truth. Values define for us what is true, right, and beautiful (Hansis 1996).

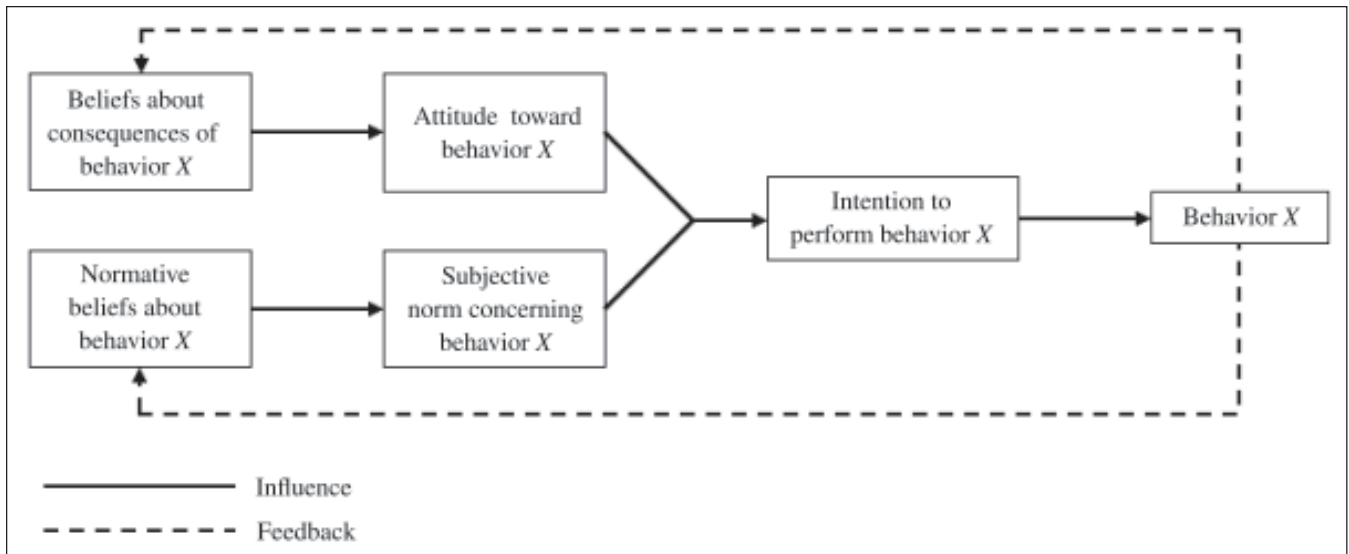


Figure 1—Prediction of behavior (Fishbein and Ajzen 1975).

One way values are expressed is through the formal principles we choose to govern our behavior—such as our laws. The Endangered Species Act reflects the value in our society of not letting species go extinct—paying attention to the effects of our actions on species that are in danger of becoming extinct, and taking action to prevent extinction, even if those measures have their own undesirable effects. The Multiple Use Sustained Yield Act is a reflection of our value of managing resources for the future, taking into account future generations, rather than simply using up what we have to meet our own needs. It also reflects the many ways our society values public lands—we want to obtain many types of benefits from national forests, not just one type.

Many of the controversies surrounding public land management are grounded in values. Therefore, to understand the controversy, we need to understand the value orientations of the people or the sides involved.

One example of how social scientists have applied the concept of values to studying human dimensions of natural resources has been to measure orientations to nature, frequently on a spectrum from utilitarian/anthropocentric to biocentric (Steel and others 1994, Vaske and Donnelly 1999, Vaske and others 2001). An individual having an anthropocentric orientation views natural resource management as being primarily for the benefits of humans; nature’s purpose is to provide economic and other benefits for humans. A biocentric orientation, in contrast, is more nature-centered; human uses and benefits are valued, but the emphasis is more on healthy ecosystems and environmental protection even if human uses must be

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**One way values are expressed is through the formal principles we choose to govern our behavior—such as our laws.**

curtailed in order to achieve it: “the biocentric perspective considers the natural world to be inherently valuable, besides any material benefits it might provide to humans. It extends ethical considerations to nonhuman entities and life forms” (Abrams and others 2005).<sup>2</sup>

The orientation is typically measured along a bipolar spectrum, allowing for an individual to have a totally anthropocentric view, a totally biocentric view, or a balanced perspective between the two extremes. Abrams and others (2005) used a seven-point scale to assess environmental vs. economic orientations; respondents identified their own orientation ranging from one (highest preference for natural conditions) to seven (highest preference for economic considerations). They called this single-item measure the Environmental-Economic Priority scale. Other measurement techniques have used not a single item, but multiple items measuring different aspects of anthropocentrism/biocentrism, which were then summed to form an index of an individual’s orientation.

The advantage of measuring values is that they help to explain many types of VBAs regarding forest management to the extent they were consistent with an individual’s forest value orientation. Steel and others (1994) found that individuals holding biocentric orientations were more likely to support policies that minimized human intervention in the landscape, such as banning clearcutting, designating wilderness areas, and protecting old-growth forests. Individuals having an anthropocentric orientation favored economic uses, including logging in wilderness areas, and supported doing away with environmental laws that conflicted with resource uses.

It is also possible to measure value orientations at a societal scale. Bengston and others (2004) tracked news media articles regarding the value orientations reflected in the coverage. They found a systematic trend that not only paralleled other research findings, but fits well with the Forest Service’s shift to an ecosystem-based approach to managing the national forests:

In this analysis of the public discourse about forests, we found evidence that Americans’ relationships with their forests continue to evolve. The decline in the share of the anthropocentric value orientation in recent decades has been significant and impressive, suggesting a steady erosion of support for the view that the value of forests is primarily as a storehouse

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<sup>2</sup> Interestingly, many definitions of the goals of ecosystem management “split the difference” between these orientations while incorporating the notion of sustainability, using wording such as “meet human needs on a sustained basis within the capabilities of ecosystems.”



of instrumentally valued benefits. This shift has been consistent and rather striking given that values tend to be fairly stable and change slowly. Just as striking is the rise in biocentric value expressions, signaling the continuing advance of an ecologically oriented view of what is important about forests and forest ecosystems.

In the context of public land management, values have also taken on a more specific meaning—the desirability of various benefits or opportunities associated with forest management compared to other possibilities. This ties in quite well with the notion of desired future conditions critical as a foundation for land use planning. Such values are referred to as “held values” as discussed by Rokeach (1973) because they are held about an object or set of objects. Rolston and others developed some of the early “held value” typologies as applied to nature (see Rolston and Coufal 1991). Bengston and others (2004) defined forest values as “relatively enduring and fundamental concepts of the good related to forests and forest ecosystems. For example, aesthetic value or beauty is a fundamental and widely held conception of what is good about forests...”

Manning (2003) defined values as “an enduring concept of the good as applied to a specific national forest,” treating the values as specific to the forest being studied. They asked people to rate the importance of 11 types of values that could be gained from a national forest, in this case the Green Mountain National Forest in Vermont. Brown and Reed (2000) used an overlapping but distinct set of 13 values in their study of local residents’ values associated with Alaska’s Chugach National Forest. Table 1 shows how the two value sets compared.<sup>3</sup>

Some differences in the measurement technique as well as the conceptual underpinnings are evident in the differences between the two sets of values. Manning’s statements incorporate the term “nature” as the connecting element. His use of the term “ecological” values is closely tied to the human benefits of those values, as opposed to Brown and Reed’s statement of biological diversity values.

Brown and Reed incorporate the notion of future values that contain elements of both option and bequest values, which have been used by economists as a basis for estimating nonuse values associated with places; similarly, their statement about intrinsic values captures another major component of nonuse values, often referred

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<sup>3</sup> One can see how “sense of place” is a closely related concept and could be viewed as a generalized value or set of values associated with a place or area.

**Table 1—Comparison of two forest value typologies**

<b>Value</b>	<b>Associated statement (Manning 2003)</b>	<b>Associated statement (Brown and Reed 2000)</b>
Aesthetic	The opportunity to enjoy the beauty of nature	I value the forest because I enjoy the forest scenery, sights, sounds, smells, etc.
Ecological	The opportunity to protect nature in order to ensure human well-being and survival	
Biological diversity value		I value the forest because it provides a variety of fish, wildlife, plant life, etc.
Life-sustaining value		I value the forest because it helps produce, preserve, clean, and renew air, soil, and water.
Recreation	The opportunity to camp, hike, and participate in other recreation activities in nature	I value the forest because it provides a place for my favorite outdoor recreation activities.
Education	The opportunity to learn more about nature	
Moral/ethical	The opportunity to exercise a moral and ethical obligation to respect and protect nature and other living things	(Intrinsic) I value the forest in and of itself for its existence, no matter what I or others think about the forest.
Historical/cultural	The opportunity to see and experience nature as our ancestors did	(Historical) I value the forest because it has places and things of natural and human history that matter to me, others, or the Nation.  (Cultural) I value the forest because it is a place for me to continue and pass down the wisdom and knowledge, traditions, and way of life of my ancestors.
Therapeutic	The opportunity to maintain or regain physical health or mental well-being through contact with nature	I value the forest because it makes me feel better physically and/or mentally.
Scientific	The opportunity for scientists to study nature and ecology	(Learning) I value the forest because we can learn about the environment through scientific observation or experimentation.
Intellectual	The opportunity to think creatively and be inspired by nature	
Spiritual	The opportunity to get closer to God or obtain other spiritual meaning through contact with nature	I value the forest because it is a sacred, religious, or spiritually special place to me or because I feel reverence and respect for nature there.

**Table 1—Comparison of two forest value typologies (continued)**

<b>Value</b>	<b>Associated statement (Manning 2003)</b>	<b>Associated statement (Brown and Reed 2000)</b>
Economic	The opportunity to get timber, minerals, and other natural resources from nature	I value the forest because it provides timber, fisheries, minerals, or tourism opportunities such as guiding and outfitting.
Subsistence		I value the forest because it provides necessary food and supplies to sustain my life.
Future		I value the forest because it allows future generations to know and experience the forest as it is now.

to as existence value. Economist John Loomis (2006) has described these components of nonuse or passive use values and their affirmation in policy and legal settings:

...existence and bequest values have been termed passive use values since they were upheld by the U.S. Court of Appeals for use in natural resource damage assessment. In ruling against the U.S. Department of Interior’s (DOI) damage regulations proposal to only allow either use or non-use values to be counted, the U.S. Court of Appeals noted: “Option and existence values may represent ‘passive’ use, but they nonetheless reflect utility derived by humans from a resource and thus, prima facie, ought to be included in a damage assessment.” (U.S. District Court of Appeals 1989: 67).

In response to this court ruling, DOI agencies include use and passive use values in their natural resource damage assessment (USDOJ 1994, Ward and Duffield 1992).

Values were measured on the National Survey on Recreation and the Environment (NSRE), a nationwide telephone survey regularly conducted since 1960 by the Forest Service and many partners; Haeefele and others (2005) described the survey and results for Forest Service Eastern Region (Region 9) residents; companion reports exist for the other regions as well. Readers are encouraged to view the research report specific to their region.

One particular values question from the NSRE asked people to prioritize a list of goals that can be associated with public lands. As such, it was a question about values:

**Values in management of federal lands.** Now, I will read you six statements describing different priorities for managing federal lands. Please rate each statement using a scale from one to five, with one meaning not important at all and five meaning extremely important. (The items are to be randomized for each respondent.)

- a. Protecting streams and other sources of clean water.
- b. Maintaining national forests for future generations to use and enjoy.
- c. Providing habitat and protection for wildlife and fish.
- d. Using and managing forests in ways that leave them natural in appearance.
- e. Providing access to raw materials and products for local industries and communities.
- f. Providing roads, accommodations, and services to help local tourism businesses.

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**Knowledge of public beliefs enables forest staff to acquire and share additional information, as well as to address conflict through well-designed public involvement processes.**

## Beliefs

Beliefs are judgments about what is true or false—what attributes are linked to a given thing. Members of the public have beliefs about many aspects of forest management—about the effectiveness of the agency, about the likelihood that projects and activities will lead to certain outcomes, about ecosystems and how they function. Knowledge of public beliefs enables forest staff to acquire and share additional information, as well as to address conflict through well-designed public involvement processes that include discussions of how agency actions promote land-use goals.

Knowledge about a topic constitutes a type of belief. Questions that attempt to measure peoples' level of knowledge about a topic are examples of belief questions—people are stating what they believe to be the case. The NSRE contained several questions on peoples' knowledge about the Forest Service; in this case, knowledge is a form of belief, but one that has a "correct" answer:

We are interested in how familiar you are with the responsibilities of the United States Forest Service. Based on your knowledge of the Forest Service, please tell me if you think each of the following statements is TRUE or FALSE, or if you don't know.

FS1. The Forest Service regulates fishing and hunting seasons.

FS2. The Forest Service has Smoky Bear as its mascot.

FS3. The Forest Service enforces the Endangered Species Act.

FS4. The Forest Service manages national forests for recreation, timber, and water.

In this instance, there is a right and a wrong answer; some statements are true and others are false. Our society values science-based knowledge; beliefs can be treated as hypotheses and tested through the use of scientific methods. Yet scientists know that beliefs once considered to be correct can be altered through new results or development of new theories. Every time the Forest Service implements a project or plan, it believes that the actions being taken will produce a desired set of outcomes. Impact assessments are estimates of what we believe will happen. However, we test this belief through monitoring, and then adapt our actions as needed based on the monitoring results. It is not unusual for a set of actions to have unintended consequences, or for the actions not to be as effective as anticipated.

Scientists know that their own worldviews and experiments are developed within a cultural context. Because beliefs are culturally defined, different cultures can have varying beliefs about the same object or event, and there is not always a “right” answer or “correct” explanation. To put it another way, there are many ways of knowing. Therefore, the agency should not expect all public beliefs to match its own, nor assume that this can be accomplished through educating the public. Instead, we should attempt to understand the various public beliefs about the topic or issue at hand, and how those beliefs are related to attitudes and values.

Fishermen, for example, may not use scientific techniques to learn where and when fish are more likely to be present, and how to best catch them. Yet they still possess great knowledge through their extensive experience, coupled with insights gained from other fishermen. This type of knowledge is referred to as “local knowledge,” or, if it has been passed through a certain number of generations, “traditional ecological knowledge.” Many collaborative projects have put practitioners and scientists together in a field setting—typically concluding that each possesses highly useful knowledge that the other does not.

Cultural consensus theory and measurement is one approach developed by anthropologists that acknowledges that some beliefs are not universally correct, but instead should be viewed as culturally defined (Romney and others 1986). Cultural consensus theory views culture as a shared knowledge base but also recognizes that knowledge is not equally distributed across all members of a

population. The analysis consists of asking a number of people from a population to respond to a set of statements and to indicate whether they believe each is true or false. The subsequent analysis shows not only the level of knowledge of each respondent but also whether there is sufficient agreement among responses to assume that a cultural consensus or shared knowledge base is present about the topic being studied. When two or more populations or cultures are studied, the researcher can also determine the “culturally correct” answers to each of the questions and assess the degree of overlap between the two populations’ knowledge.

Cultural consensus analysis has been used to measure the congruency between belief systems across different cultures—for example, natural resource users, scientists, and natural resource managers. If managers and users have different beliefs about a management activity and its effects, for instance, it is important to understand the reasons why, so we can improve communication and more accurately predict social impacts. Managers should not think, however, that what’s needed is a strategy to educate the users to learn the managerial belief system. Because many types of beliefs are tied up in a cultural system, along with associated values and meanings, reading an informational brochure should not be expected to change an individual’s or group’s fundamental beliefs.

It should be clear that management agencies are better able to design and implement actions when they know what the public and key stakeholder groups believe, and why. This is demonstrated by a study of rural communities in the interior Columbia Basin that measured residents’ beliefs about the role and economic contributions of resource-extractive industries in their local economies (Harris and others 2000). The study found that 37 percent of all communities were perceived as having an economy that was moderately to highly dependent on timber, but that in those towns, timber industries employed less than 10 percent of total employees. A similar finding was evident for agriculture; residents perceived 58 percent of the communities to be moderately to highly dependent on agriculture although it employed less than 10 percent of total employees in those towns. The discrepancies between beliefs and the objective measures of economic contributions of the industries in these communities suggested that people may make systematic misperceptions about the role of various industries in the local economy; some rural economies actually may be more diverse than perceived.<sup>4</sup>

<sup>4</sup> In some cases, 10 percent of employment could reasonably be considered “moderate dependency.” Also, people in some of the towns may have been thinking of the industries in terms of their social or cultural importance, and assumed that economic importance was proportionately higher as well. Interested readers can refer to Jacob and others (2005) for an in-depth discussion of possible reasons why people can misperceive the economic role of traditional industries in a local economy.

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**It should be clear that management agencies are better able to design and implement actions when they know what the public and key stakeholder groups believe, and why.**

That is one reason why the Bureau of Land Management (BLM) currently requires that an economic workshop be held in local communities whenever a land use plan is undergoing a major revision, so residents will develop a common understanding of their economy as measured objectively by a set of indicators. The BLM also understands that the set of standard economic indicators does not tell the whole story by itself—the residents at the workshop can provide valuable interpretations of why trends are occurring, or of how economic benefits are distributed across the community.

Some social scientists have referred to evaluative beliefs, which are a hybrid of attitudes and beliefs that express a belief about an object but incorporate an evaluative component. For example, “The Forest Service does a good job of managing recreation” is a belief because it associates an object (the Forest Service) with an attribute (good job managing recreation), but it also expresses a favorable evaluation—an attitude. One approach has been to consider a person’s attitude toward an object as “a summary of all of his evaluative beliefs about the object” (Oskamp 1977). A closer look at attitudes will help us to understand this point.

## Attitudes

Attitudes are tendencies to react favorably or unfavorably to a situation, individual, object, or concept. Attitudes arise in part from beliefs and values. People’s attitudes toward the Forest Service, for instance, may arise from their beliefs about how effectively the agency manages public lands and how closely the agency’s perceived goals (values) match their own. Attitudes could also stem from a single, important positive or negative encounter on a national forest or with a Forest Service employee.

The Forest Service cares about attitudes because that is how members of the public express their opinions of the agency. If we do not pay attention to public attitudes, we risk not only taking socially unacceptable paths but not even knowing we did, or why. Attitudes toward the agency and its actions open the door to discussions about values, beliefs, and other reasons why people like or dislike our goals, methods of reaching them, and management outcomes.

Attitudes are typically believed to be more subject to change than more deeply-held values or beliefs. For example, new information can change our attitude toward an object. Advertising is an attempt to elicit a favorable attitude (and intention to purchase a product) from a potential consumer, especially in comparison

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**If we do not pay attention to public attitudes, we risk not only taking socially unacceptable paths but not even knowing we did, or why.**

to a competing product or brand. Social psychologists have studied persuasion to better understand the processes and conditions associated with attitude creation or change.

Attitudes can be measured many different ways, and at many levels of specificity. A tremendous literature has developed over the past 75 years exploring the conditions under which attitudes are best apt to predict behavior or other variables we wish to infer from attitudes. The specificity of the attitude measurement, and the corresponding specificity of the behavioral intent, are very important when attempting to predict a specific behavior. Fishbein and Ajzen (1974) found almost no relationship between attitude toward religion and 70 specific religious behaviors but substantial relationship between attitude toward religion and a composite score of the 70 behaviors. Attitudes are typically very situation- and context-specific; general attitudes can be very poor predictors of attitudes toward very specific actions or conditions (Oskamp 1977). Attitudes may influence behavior more strongly when situational factors that contradict our attitudes are weak. Attitudes also have a greater influence on behavior when we are aware of them and when they are strongly held. And although it makes the situation even more confusing, it is not uncommon for individuals to hold one or more attitudes that appear to be inconsistent—one must always look to the method of measurement and the attitude that is being described.

Attitudes are perhaps the most commonly measured attribute in studies of people and natural resources. The NSRE measured attitudes in several ways. The first set of questions below (which were considered evaluative belief questions by the researchers) measured not what people believe the role of the Forest Service actually is (as defined, perhaps, by enabling legislation), but what the Forest Service **should** be, which is why we are using them here as an example of attitudes—they are clearly measuring preferences:

A role of the Forest Service should be to:

QBEL1: Expand access for motorized off-highway vehicles on National Forests and Grasslands (for example, snowmobiling or 4-wheel driving).

QBEL7: Conserve and protect National Forests and Grasslands that support water resources, such as streams, lakes, and watershed areas.

QBEL12: Provide natural resources from National Forests and Grasslands to support communities dependent on grazing, mining, or timber harvesting.



QBEL24: Use public advisory committees to advise on public land management issues

QBEL29: Increase law enforcement on National Forests and Grasslands.

Strongly Disagree    1    2    3    4    5    Strongly Agree  
[“Don’t know” was also provided as a response option.]

Note that there is no right or wrong answer to the questions as worded. However, if researchers had asked what the role of the agency “is” then there could be right and wrong answers based on legislation and policy.

The second set of questions asked for an evaluation of Forest Service performance at accomplishing those same goals—without asking whether the goal itself was desirable. In fact the second set of questions, which the researchers referred to as attitude questions, appeared to have a dimension of belief in them, as well as a classic attitude response scale (favorable-unfavorable).

Rate how you feel the Forest Service is doing at:

QATT1: Expanding access for motorized off-highway vehicle use on National Forests and Grasslands, for example, snowmobiling or 4-wheel driving.

QATT7: Conserving and protecting National Forests and Grasslands that support water resources, such as streams, lakes, and watershed areas.

QATT12: Providing natural resources from National Forests and Grasslands to support communities dependent on grazing, timber harvesting, or mining.

QATT24: Using public advisory committees to advise on National Forests and Grasslands management issues.

QATT29: Increasing law enforcement on National Forests and Grasslands.

Very Unfavorable    1    2    3    4    5    Very Favorable

One obvious analysis involving these two sets of questions would be to cross-tabulate the desirability of the goal and evaluation of the Forest Service’s progress toward meeting it. Are the two variables related? We might hypothesize that, from the Forest Service’s perspective, it is good when we are viewed as making progress toward goals that are defined as more important. We are less concerned at being seen as not making sufficient progress toward a goal if that goal is not important.

But what is more likely is that there are some systematic relationships between these two variables that can be better understood by knowing something about individuals' values or beliefs. This is the process researchers use to tell a story—to give meaning and understanding and context to an individual's or group's orientation to alternative public land management strategies and outcomes.

## Extracting VBAs From Existing Documents

This section describes several methods of extracting VBAs from existing (secondary) sources of information. Sources of information could include public comments received during project scoping meetings or during the public comment period on a NEPA document; community, county, state, regional, or federal planning documents; transcripts from existing research studies; articles published or stories covered in newspapers or other mass media; and articles or excerpts from other published documents. Even if primary research is planned to measure VBA and related information for a population of interest, analyses of existing materials may be valuable:

Prior to developing and administering studies to collect primary data, the researcher should determine whether additional information collection is necessary. Data that already have been collected are called secondary.

Secondary data can be used to complement and validate primary data and to cover topics about which it is not possible to collect primary data.

Secondary data also may reduce or eliminate the need to collect primary data [Bright and others 2003a].

Many of the same advantages and disadvantages that apply to any kind of secondary research also apply if the topic of interest is VBAs (table 2). However, additional caveats apply when measuring VBAs. First, there is a good chance that VBA information does not exist that is sufficiently specific to the forest setting, the relevant stakeholder groups, and the issues at hand. One may be tempted to use VBA information that is tangential to the planning situation simply because it is available; there is nothing wrong with this as long as any associated assumptions or extrapolations are described in a transparent fashion, so the reader and decisionmaker are readily aware of them. Second, attitudes in particular, but also beliefs and values (especially as used in the context of forest planning) are subject to change through new experiences or exposure to information. This means that VBA information could easily have changed in a given population since it was last measured.

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**Attitudes in particular, but also beliefs and values are subject to change through new experiences or exposure to information.**

**Table 2—Advantages and disadvantages of secondary data**

<b>Advantages</b>	<b>Disadvantages</b>
Data collection takes less time, money, personnel, and travel than primary data collection, especially when data are gathered continuously.	It may be hard to identify biases in historical records. It is hard to determine the reliability and validity of some secondary data.
Use of most documentation does not require author permission.	Interpretation of secondary data, especially historical data, is often subjective, and will differ from reviewer to reviewer.
It increases the researcher’s familiarity with the study area’s social climate.	Secondary data records may be incomplete or out-of-date.
It provides baseline data, which give the researcher an ability to analyze trends.	
It may offer unique and socially colorful information that field research methodologies cannot.	

Source: Bright and others 2003a.

We will characterize analysis of existing information regarding VBAs as taking one of three forms: using existing descriptions of VBAs; analyzing existing sources of information using qualitative methods; and analyzing existing sources of information using quantitative methods. Note that all three of these require some level of effort; even if a readily available source of information describes relevant VBAs, there is still the need to synthesize them, relate them to the planning issue(s) and setting(s), and assess their utility for various purposes.

### Using Existing VBA Information

If you have discovered existing information that is timely, relevant to the planning issues, setting, and populations or stakeholder groups of interest, then consider yourself fortunate—this is the exception, not the norm. However, in some instances a local university may have conducted a social assessment of the study area, a community may have created a development plan that describes its values regarding associated public lands, or a stakeholder group may have conducted a self-assessment of its preferences regarding an upcoming forest plan.

A more common situation exists when a national study has been conducted regarding VBAs associated with the planning or project issue at hand. Frequently, managers and planners struggle with how to assess the national interest and associated VBAs for planning issues such as fire management, invasive species, timber management, or off-highway vehicle access. The VBAs of stakeholder groups having a vested interest in forest management, and even the VBAs of the local and regional public, are more likely to be known through ongoing contact such as conversations, public meetings, and written comments. Local elected officials and

planners may actively participate in the planning process. Although these mechanisms are no substitute for a systematic inventory of local VBAs, they can help to mitigate the lack of information.

More problematic is how to describe the VBAs of another key stakeholder group—the national public—but primary research at the national scale may be available. One example is the National Survey on Recreation and the Environment (NSRE), from which we cited questions earlier in this technical guide. Another example is the survey on the national public's attitudes toward and knowledge of fire behavior and management (Bowker and others 2005), which will be described in detail later in the guide. These surveys are designed to allow regional analysis to be used to portray VBAs of regional publics.

One option for incorporating such national studies into planning documents is to rely on existing reports and analyses if those provide the necessary information. If not, it may be necessary to either obtain the data set to conduct independent analyses more pertinent to the planning issues, or to work with the researchers to query the database regarding specific information needs. In some cases, extra costs may be incurred. However, if the desired information is available, paying for additional analysis is far cheaper and quicker than initiating a new data collection effort. Contacting the principal investigator, keeper of the data, or other person connected with the original data collection is always a good idea. Even if the information already exists in a usable format, you may wish to ask the principal investigator (PI) to review your use of it to make sure it is appropriate.

If existing sources of VBA information are used for planning purposes, make sure that the writeup includes the source of the VBA data and related information about the study, such as when and by whom it was conducted, its purpose, the population(s) of interest and sampling method, and how VBAs were measured.

It is also critical to describe its level of applicability to the current planning setting, including the representativeness of stakeholder groups or other populations of interest, and any assumptions and associated caveats for applying the study VBAs to the planning situation.

Another option that may be adequate for measuring VBAs for some purposes is Forest Service Issues in the News, an existing Web site tracking media coverage of seven key issues associated with the national forests, available at <http://ncrs.fs.fed.us/issues/>. Media coverage is tracked for eight topics: fuels reduction, healthy forests, invasives, logging, motorized recreation, the 2005 planning rule, the roadless rule and road building, and an index of conflict related to these seven topics.

The site explains that monitoring the content of the news media allows users to take the pulse of ongoing public debate about important issues and to track changes in the debate over time. Its target audience includes planners, managers, public affairs officers, communications officers, policy analysts, policymakers, and others. The site lists a number of potential applications of this information: understanding the social context for planning and decisionmaking, identifying stakeholder concerns, designing effective communication strategies, assessing the extent to which Forest Service messages are being conveyed in news media stories, and evaluating the response to new policies and programs.

One additional option consists of hiring a consulting firm, local university, or other entity to assemble existing information regarding relevant VBAs for the population(s) and study area(s) of interest. Such a contract could include a literature review for a specific issue, such as VBAs regarding off-highway vehicles or for a specific area, such as the California desert. The local university or college member of the Cooperative Ecosystem Study Unit (CESU) would be a good place to start. A review of relevant materials, packaged as desired by the agency, will likely be affordable and will constitute the best available science regarding VBAs of interest. Of course, the report could have the disadvantages of secondary data analysis described in table 2. The main problem in most cases is that the existing information will likely not be pertinent to the specific set of planning or project issues, resource conditions, or objective for which the VBA information is required.

## Reviewing Existing Documents: Content Analysis

This section provides direction on how to extract VBAs from source materials that consist of text or narrative. This is done using content analysis, a generic term that applies to a variety of systematic qualitative and quantitative techniques for making valid, replicable inferences from large volumes of material (usually textual) by categorizing and summarizing the contents.

The most common use of detailed qualitative content analysis by federal agencies is to organize and summarize public comments received during formal comment periods, when complete records of comments and responses are legally required. The Forest Service Ecosystem Management Coordination, part of the NEPA Services Group, (<http://www.fs.fed.us/emc/nsg/index.htm>) provides training and contracting assistance for this type of content analysis. Lewins and Silver (2007) and Audience Dialog (2008) contain information on content analysis software and related information.

Whatever sources and methods are used, the data must be reduced (organized and summarized) and displayed so that conclusions and recommendations can be made. The following steps encompass both qualitative and quantitative content analysis (Krippendorff 2004).

1. **Identify the units of analysis.** You will want to look for comments or sections of text that include a topic (explicitly or implicitly), a decision or action pertaining to the topic, and any reasons or rationales—VBAs—regarding the topic, decisions, or actions.
2. **Select a sample.** What documents are you going to review? Consider documents that will be superseded by the current project (such as the existing plan in a plan revision), and any recent documents, decisions, public comments, and media sources that pertain to similar issues.
3. **Record/Code** comments by identifying comments, categorizing (“coding”) them by topic, and storing in a database or spreadsheet that can be used to sort comments by topic, or simply by using a word processor.
4. **Reduce data** by organizing and summarizing comments in an outline format, with topics at the first level, values and actions or decisions pertaining to the topic at the second level, and VBAs at the third and fourth level.
5. **Make inferences.** Report results, including information gaps.
6. **Provide conclusions and recommendations**, such as the need for additional information.
7. **Quality control/quality assurance** should ensure replicability, accuracy, and precision appropriate to the needs of the project.
8. **Document** the process, including methods and software used, development of coding categories (topics) and any quality assurance or quality control methods, as well as any contracting information.

### Qualitative Content Analysis

One illustration of the relationships among values, beliefs, and attitudes is provided by Heberlein (1981), who demonstrated how they can be qualitatively inferred or extracted from text using an eloquent passage (November: Axe-in-Hand) from Aldo Leopold’s *A Sand County Almanac*:

I have read many definitions of what is a conservationist, and written not a few myself, but I suspect that the best one is written not with a pen, but with an axe. It is a matter of what a man thinks about while chopping, or

while deciding what to chop. A conservationist is one who is humbly aware that with each stroke he is writing his signature on the face of his land. Signatures of course differ, whether written with axe or pen, and this is as it should be.

I find it disconcerting to analyze, *ex post facto*, the reasons behind my axe-in-hand decisions. I find, first of all, that not all trees are created free and equal. Where a white pine and a red birch are crowding each other, I have an *a priori* bias; I always cut the birch to favor the pine. Why?

Well, first of all, I planted the pine with my shovel, whereas the birch crawled in under the fence and planted itself. My bias is thus to some extent paternal, but this cannot be the whole story, for if the pine were a natural seedling like the birch, I would value it even more. So I must dig deeper for the logic, if any, behind my bias.

The birch is an abundant tree in my township and becoming more so, whereas pine is scarce and becoming scarcer; perhaps my bias is for the underdog. But, what would I do if my farm were further north, where pine is abundant and red birch is scarce? I confess I don't know. My farm is here.

The pine will live for a century, the birch for half that; do I fear that my signature will fade? My neighbors have planted no pines but all have many birches; am I snobbish about having a woodlot of distinction? The pine stays green all winter, the birch punches the clock in October; do I favor the tree that, like myself, braves the winter wind? The pine will shelter a grouse but the birch will feed him; do I consider bed more important than board? The pine will ultimately bring ten dollars a thousand, the birch two dollars; have I an eye on the bank? All of these possible reasons for my bias seem to carry some weight, but none of them carries very much.

So I try again, and here perhaps is something; under this pine will ultimately grow a trailing arbutus, an Indian pipe, a pyrola, or a twin flower, whereas under the birch a bottle gentian is about the best to be hoped for. In this pine a pileated woodpecker will ultimately chisel out a nest; in the birch a hairy will have to suffice. In this pine the wind will sing for me in April, at which time the birch is only rattling naked twigs. These possible

reasons for my bias carry weight, but why? Does the pine stimulate my imagination and my hopes more deeply than the birch does? If so, is the difference in the trees, or in me?

The only conclusion I have ever reached is that I love all trees, but I am in love with pines.

Table 3 shows Heberlein's extraction of the evaluative beliefs, beliefs, and values from the passage (note his use of the term "evaluative beliefs," defined earlier).

As another example, suppose that public VBAs regarding fire and fuels management have been identified from comments received during scoping:

"Human lives are at risk from wildfire, and it is your job to protect them."

"Commercial contracts for mechanical thinning are just another example of how the Forest Service is in the timber companies' pockets."

"Catastrophic fires profoundly damage habitat."

"Mechanical thinning will promote undergrowth and leave structures as vulnerable to fire as they are now."

"Many feel the forest should focus efforts on protecting property in the wildland urban interface."

"I doubt that you have either the expertise or good judgment to safely conduct prescribed burns."

These statements suggest several interesting areas of inquiry regarding VBAs:

- Values: Are other basic values (besides property, safety, and habitat) implicated by wildland fires and fire risk? If any of these values are mutually incompatible in this context, which should have priority? Are there alternative priorities? (For instance, a planner may wish to know the relative value of property protection compared to other goods and services, including nonuse values.)
- Beliefs: What do people believe about how mechanical thinning affects (1) rates of undergrowth and (2) fire risk? If this were to become a significant point of contention, the agency would at some point want to present the best scientific evidence available. What other beliefs do people have about the effects of mechanical thinning? Forest Service staff may want to identify misperceptions or misinformation and develop ways to get new or better information to the potentially affected public. Conversely, the public may have experience or other information that could affect the agency's beliefs about mechanical thinning.



**Table 3—Leopold's attitude toward pine trees**

Attitude:	I am in love with pines						
Evaluative beliefs:	Trees planted oneself are better	It is better to help trees that are less abundant.	It is better to take care of longer living trees.	My woodlot with pines is better than neighbors' with birch.	Having pines produces more income.	It is better to withstand elements and provide shelter.	Indian pipes, pyrolas, and twin-flowers are better than hairy woodpecker. bottle gentians.
Beliefs:	I planted pines.	Birch is abundant.	Pine is scarce.	I have pine.	Pine brings \$10 per thousand board feet.	Pine needles stay out in winter wind.	Bottle gentians grow under birches. Hairy woodpecker, Indian pipe, pyrola, and twin-flower will grow under pine. Pleated will nest.
Values:	Family security (paternalism).	Equality (underdog bias).	A sense of accomplishment (significance).	Social recognition (woodlot of distinction).	A comfortable life (eye on the book).	Courageous (like myself, braves the winter wind).	A world of beauty. Imaginative (stimulate my imagination).

Source: Heberlein 1981.

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**Computer-aided text analysis has been used to meet a variety of information needs associated with the human dimensions of natural resources data.**

- Attitudes: Do people trust the agency to be objective regarding commercial thinning projects? Do they trust the agency to conduct controlled burns safely? Because attitudes (and the emotions they include) emerge from both beliefs and values, what beliefs and values underlie the attitudes? What has the agency done—or what do people believe it has done—that contributed to those attitudes? Are the underlying beliefs correct? Are doubts about the Forest Service’s capacity to manage controlled burns sparked by a general mistrust of government or by firsthand experience with past Forest Service actions? Knowing the answers to these questions better positions Forest Service personnel to be responsive both in their interactions with the public and in their ultimate decisions.

### Quantitative Content Analysis

Computer-aided text analysis has been used to meet a variety of information needs associated with the human dimensions of natural resources (Bengston 2000). Many programs and computer-assisted strategies are available for analyzing qualitative data (typically large amounts of text, although other types of data can be accommodated by some software packages). These range from word processing macros to sophisticated packages such as *Atlas ti*,<sup>5</sup> to custom, patented applications such as *InfoTrend* (Bengston and Fan 2000). One thing they all share is the ability to extract specific types of meanings (that is, VBAs) from large amounts of qualitative data.

For example, Bengston and Fan (2000) conducted an analysis of thousands of online news media stories about the Forest Service to assess coverage of topics related to the agency’s strategic goals related to conservation leadership, providing multiple benefits within the capabilities of ecosystems, and ensuring sustainable ecosystems. In one analysis, they tracked attitudes (as reflected by media coverage) toward the Forest Service’s stewardship and ethics over a 7-year period. They found that expressions of positive attitudes toward Forest Service stewardship were evident in 60 percent of the coded paragraphs, reflecting a 60-percent “approval” rating. These results were consistent with those of public opinion surveys conducted within the same period. They also tracked trends in four types of values or benefits stemming from forest management.

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<sup>5</sup> The use of trade or firm names in this publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Topics analyzed using this content analysis method can be quite specific as well; one study explored media coverage of the Forest Service's stewardship of the Tongass National Forest in Alaska (Allen and others 2000). Another study examined media content related to public understanding of defensible space and the implications for managers (Johnson and others 2006):

Computer coded content analysis was used to analyze a database of about 77,000 news stories from more than 200 newspapers, newswires, television and radio news transcripts, and news magazines covering the period January 1, 2002 through January 31, 2005. News media discussion of wildfire is overwhelmingly dominated by firefighting, and discussion of defensible space is a minute fraction of the total. Coverage of defensible space focuses on vegetation clearing around homes to the exclusion of other practices such as maintenance and fire resistant building materials. Only 20 percent of all defensible space media coverage mentions defensible space around communities. Managers have an opportunity during times of peak media coverage of wildfire to expand the discussion about defensible space from the current focus on vegetation clearing to include the full range of activities a homeowner can undertake to mitigate damage.

Sampling is an issue with content analysis just as it is with primary data collection. Analysis of comments received from individuals who chose to submit them is different than analysis of a random sample of national news media coverage. The results will generalize to a population only to the extent that the data analyzed are drawn from some kind of random sample of that population.

## **Conducting Qualitative VBA Studies**

In the social sciences, "qualitative research" is an umbrella term used to describe a variety of research methods or approaches. Qualitative investigation complements quantitative approaches, so there is much to be gained by using both, instead of one or the other. The line between qualitative and quantitative studies is not always clear in practice, and many research efforts incorporate elements of both. Nonetheless, it is relatively easy to conceptually distinguish the two types of research:

Qualitative data are usually verbal responses to issue statements. The latter are not statistically analyzed; rather, they are summarized and interpreted by the researcher... Qualitative methods, although often sacrificing the

representative nature of attitudes, allow the researcher to obtain rich, in-depth information about issues... Individual interviews or focus groups will provide a variety of information about the individual's or stakeholder's values and opinions (Bright and others 2003a).

Qualitative methods apply to observation of what happens in situ; that is, within their naturally occurring context. It deals with the **meanings** these actions, places, people, or things have for the actors or participants. For instance, we might know definitively (quantitatively) that 237 visitors come to a campground to stay overnight, and that while there they fish and take pictures. But what does the place and associated experiences **mean** to them? Why do they do it, what feelings do they experience, what are the associated values, what are the problems they encounter, or what opportunities do they see there?

As does quantitative research, qualitative research has its own standards and rigor. Qualitative methods produce information that is varied, complex, and contextually rich (see, for instance, Hancock 1988). For a more detailed look at the philosophy and methods associated with qualitative, quantitative, and mixed-method approaches see Creswell (2003).

We will take an in-depth look at one recent qualitative study to illustrate the methodological considerations, benefits, and limitations of this kind of research, as well as its uses in public land planning and management. This example is a consultant's study of values, beliefs, and attitudes conducted for the Coronado National Forest and Region 3 (Southwestern Region) of the Forest Service (Russell and Adams-Russell 2005).

The same consultants conducted a similar study describing results for Arizona tribal peoples (Russell and Adams-Russell 2006b) and another specific to the Apache-Sitgreaves Forest (Russell and Adams-Russell 2006a). In the Apache-Sitgreaves report, they noted that the VBA information was only part of a set of socioeconomic and cultural information being assembled for planning purposes. They mentioned two other prominent information sources: a socioeconomic assessment for the Apache-Sitgreaves National Forest and other Arizona forests prepared by the University of Arizona; and an upcoming survey of Arizona and New Mexico residents to be conducted by the Rocky Mountain Research Station to provide forest-specific and regionwide information about forest resource and management issues. The authors said that the resulting set of information would provide planners with forest-specific as well as state and regional information for comparison.

This highlights the earlier point that information about the values, beliefs, and attitudes of national forest stakeholders is just one type of socioeconomic data that can be valuable in forest planning and management activities. When setting out to collect VBA information, it is important to know how it will be used in conjunction with other human dimensions information that will be available. The University of Arizona study relied on data from the U.S. census and other existing sources to describe socioeconomic conditions and trends in the communities and counties adjacent to the forest, providing a quantitative complement to the qualitative studies. Each source focused on an important aspect of the human dimensions of forest management; the story would be incomplete without both.

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**When setting out to collect VBA information, it is important to know how it will be used in conjunction with other human dimensions information that will be available.**

## Qualitative Case Study

The following description consists of text or information summarized or taken directly from the Russell and Adams-Russell (2005) report, followed by a commentary discussing the strategy employed and its relevance to qualitative VBA studies.

The authors described the specific role of the values, beliefs, and attitudes information and how it differed from that of the University of Arizona study, saying its purpose was to “identify local perspectives about key issues and concerns about forest resources and management...it portrays local perspectives from selected individuals that frame issues and imply solutions relevant for forest management and planning.” They also stated that the results were being used by Rocky Mountain Research Station researchers as one source of information to formulate the content of an upcoming population-based survey.

Qualitative studies are well-suited to the indepth understanding of a topic or concept from the perspective of forest stakeholders. One can learn a tremendous amount by letting stakeholders discuss topics that matter to them (that is, things that they value about forest opportunities or resources), explaining why these things matter (that is, their beliefs about what resources or opportunities are connected to what personal or social benefits), and what it means for forest management (that is, their attitudes toward various projects, activities, or allocations).

Qualitative studies can provide a fascinating way to develop hypotheses that can be tested in quantitative studies that allow estimation of the patterns of those attitudes, beliefs, or values within a broader population (such as community or regional residents, forest visitors, or the national public).

Data were collected for this study using focus groups and individual interviews. Five focus groups were conducted: two groups in Tucson and one each in Douglas, Safford, and Sierra Vista. Additionally, individual interviews were conducted with members of state and local government as well as concerned citizens who were not able to attend the focus groups. The results were analyzed to identify themes about values and beliefs concerning forest resources and management priorities. The results of the analysis were presented by describing the major themes and public assessments regarding management priorities.

One issue with qualitative studies is how to know when enough people have been interviewed or when sufficient focus groups have been convened. Often, budget considerations play a major role in the amount of effort we can expend; the question then becomes how to collect the most and best information with the available funding or in the available time. In these cases, one tip is to keep collecting information until you feel you have exhausted the range of values, beliefs, and attitudes present in the population of interest. For example, if we talk to six ranchers about a set of issues associated with grazing on forest lands and we hear similar values, beliefs, and attitudes from each, then we might assume we would hear “more of the same” if we talked to six more. This may be the case, but perhaps we just talked to six large-scale ranchers, and have thus missed the perspective of smaller scale ranchers. Maybe we have talked to ranchers who graze cattle only on public lands, missing the perspective of those who use private lands or those who use both in different seasons. Maybe we have talked only to non-Hispanic ranchers, missing the perspectives of Hispanic ranchers.

Therefore, the research needs to begin with some existing knowledge about the main “types” of ranchers out there—or the main subgroups of other populations of interest. If the topic is a forest travel plan and we want information on the views of forest visitors, maybe we “segment” visitors based on primary modes of travel, or on subgroups of participants within travel modes or recreational activities. Fortunately, Forest Service employees know a good deal about their constituents and stakeholders, with whom they come into contact regularly. Chances are good that, collectively, employees on a district will have a good idea of the various segments of forest stakeholders.

The Tucson focus group sessions were held at the Sabino Canyon Visitors Center. One session was attended by five people from the greater Tucson area, including persons from Green Valley in the Nogales Ranger District.

Hiking, off-highway vehicle (OHV), and other recreational interests were represented in this group. The second focus group session was attended by eight individuals from the Tucson metropolitan area, including representatives from conservation, environmental, and research groups. The Douglas session was attended by six people from various parts of eastern Cochise County with the majority representing ranching and business interests with direct connections to the Coronado National Forest. Eight people attended the Safford session, which was composed primarily of local government, business, and agricultural interests. The Sierra Vista session was attended by 11 people; this was the most diverse focus group, with participants representing environmental, business, hiking, ranching, and conservation interests.

The location of focus group meetings or interviews is an important consideration. Ideally they are held on neutral ground, such as a community meeting place, a university campus, or a field setting, as opposed to a district office. Field settings are ideal if the main issue concerns a place or set of places that can be visited, or for on-the-ground issues such as grazing in a riparian area or reclamation of a fire-disturbed area. There is nothing better for bringing out VBAs related to a setting than visiting it as a group.

The composition of focus groups is obviously important. We know that we can't generalize to a population based on a single focus group or even a set of focus groups, so the group composition must speak for itself. Some focus groups are composed of people who share one or more characteristics and are expected to have overlapping VBAs, such as members of a club, ranchers, or environmental group members. Others are designed to be more diverse, covering the range of viewpoints associated with a resource management issue. A related issue is how people are chosen, whether for focus groups or individual interviews. If the goal is to have a wide range of attitudes, values, and beliefs represented, then participants can be targeted to represent the desired range.

The focus group meetings ranged from approximately 2 to 3 hours, with the average about 2 hours and 15 minutes. The Tucson meetings were held on a Saturday in the morning and afternoon. The Douglas meeting was held on a Monday morning, and the Safford and Sierra Vista Groups were held on weekday evenings starting at 7 p.m.

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**There is nothing better for bringing out VBAs related to a setting than visiting it as a group.**

How much time to schedule is a common question, as is what time of day to convene the focus groups. For most focus groups, a half day is sufficient. Plan on providing refreshments and per diem for people who have to travel to reach the meeting location. Some other type of incentive for participating should be considered, whether it is a token of appreciation such as a project coffee mug, a stipend, or a donation to the club or community if applicable. The meeting time should be designed to be convenient for participants. There may be some existing standards or expectations among the populations of interest based on their past experiences.

Focus group participants were provided with a discussion guide to structure the group's discussions regarding the issues, concerns, values, and beliefs of participants about the Coronado National Forest and its management. The guide outlined general areas of interest, but the issues of concern to the participants actually structured the meeting. The guide was sent to participants before the sessions so participants would be aware of the topic areas for discussion. The guide is provided in the appendix as an example of how one can provide structure to interview or focus group discussions while still allowing flexibility.

Quantitative studies typically require a carefully laid-out, thoughtfully worded questionnaire or survey instrument that is presented to all respondents. For qualitative studies, it is usually sufficient to develop a list of topics to cover or a set of lead-in questions that cover desired areas of information. In this case, the discussion guide was not only prepared but sent to participants before the meeting to give them time to collect their thoughts, write notes, or even do some research on their own. That is not essential, but it is a good practice that shows consideration for participants by giving them time to prepare. In either case, researchers should allow time for participants to bring up other topics, whether they're directly related to the discussion guide or not. Focus groups and interviews should be viewed as two-way communication forums. Allowing people to bring up their own issues is another way of demonstrating respect for your research participants, and may lead to important findings that you would not have otherwise discovered. In fact, the ability to learn about new topics as well as to reveal the intertwined VBAs about a known topic is a particular strength of qualitative studies.

The focus group sessions were recorded to ensure access to the most detailed information for analysis. Notes were also taken during the groups and key areas of interest briefly identified as well as the time location within the audio recording. This facilitated subsequent access to the information. The recordings were coded using a combination of predefined

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**Focus groups and interviews should be viewed as two-way communication forums.**



and emergent codes. The predefined codes corresponded to the topic areas in the discussion guide. The emergent codes were based on topics volunteered by participants. The analysis identified themes in the topic and emergent codes and used participants' statements to illustrate the content of the issues.

There are many ways to analyze qualitative data; the practice employed here is common and relatively straightforward. Some of the themes are known or at least suggested in advance, and others emerge from the group discussion. One issue is that there are many ways of categorizing the information received during the focus groups—none of which is necessarily right or wrong. Two people could conceivably develop different themes from the same set of data (the transcripts). For this reason, analysts employ a variety of procedures to serve as checks on the analytical process.

Quantitative methods of analyzing verbal or written responses also are available. Many text analysis programs identify strings of text and code them either based on predetermined categories or by the associations among words that emerge from the collective set of text responses. Of course, qualitative and quantitative methods of data collection and analysis can be combined in the same study. For example, we may want to describe our sample of interviewees demographically, or may want to obtain some responses on a five-point scale, supplemented by verbal explanations of peoples' VBAs. Many researchers faced with analyzing verbal or narrative data have wished they had a few responses that were more quantitative to supplement qualitative responses.

The report described the results of a focus group of ranchers in tandem with results of personal interviews with other ranchers. The views of ranchers encompassed values about the landscape and their lifestyles, beliefs about the Forest Service and how it should incorporate ranchers' views and experience into management, and attitudes toward the agency and its management practices. The results are described in terms of the major themes expressed by ranchers—what topics they talked about, and how. Themes are defined by quotes from the ranchers that illustrate, in their own words, the set of values and beliefs that create the theme and distinguish it from others.

One of the topics or themes identified was "Conservation Values and Beliefs: Ranching and the Value of Local Knowledge." Ranchers who participated in the study believed they had a strong conservation ethic and

that their long-term experience with the land provided them with knowledge that they used to maintain healthy resource conditions. The ranchers recognized that grazing “has resulted in some abuses” but suggested that these did not represent the typical relationship of ranchers with forest lands. This topic had a number of interrelated dimensions or themes. One was that their long relationship with the land as ranchers gave them deep knowledge about ecosystems. They believed that this knowledge should be used more by managing agencies, but that agencies were not really interested in hearing about this knowledge and how it could be applied. They also believed that other special interests did not possess the same in-depth knowledge about what really happens on the landscape. They believed that other people had many misperceptions about ranching and its effects, and that people failed to see that ranchers not only valued conservation, but practiced it in order to stay in business.

The authors used quotes from the participants to illustrate this theme:

- I am out riding fence regularly. I see what is happening to the grass. I see what the deer are doing and what is happening with other wildlife. I know the cycles of this place and how it works. They [Forest Service] don't really listen to me about how things are out here. They think they are the experts, but I have lived my whole life out here and I know a few things about it.
- Ranchers are good stewards and conservationists, in part, because their livelihood depends on it. However, there is a strong ethic of stewardship that is also based on the traditions of Arizona ranching and the knowledge required to be successful in a challenging environment.
- In Arizona if you over-graze, the land will not support it. So you need to be a good ecologist and understand conditions here. In this environment, you only get one shot at being greedy because you will not get another chance.
- There are these people that have been here for 3 days or 4 days or however long they have been here. And, we have been here all of our lives. We have lived here for generations and we have knowledge and our knowledge is discounted. ...The Forest Service needs to listen to locals. I was out with [person] and they said “look at what the cows are doing to the agaves. They are all torn up.” But, it was bears and they didn't know the difference between bears and cow damage to the agaves.

- There are groups of “experts” in the urban areas of Phoenix, Tucson, Albuquerque, but they really don’t know what is going on out here. They want the country to go back to nature and they are telling us that “we are kicking your butts in the press.” We are busy working and making a living and the problem is getting bigger. People believe the first thing they read and it is not always true. So, we have a large group of people who don’t have a clue about what is going on, but who are determining what is going on because they have the money and access to the press.
- We have been here for generations and we want to make sure we can demonstrate the effects of grazing one way or the other. We want to know as much as anyone about what the effects are and sometimes it seems there is more damage from other types of uses than from grazing, but we want monitoring that will help to clear up the situation.
- A number of scientists are working with us to find out what impacts cattle do have...a lot of things have been blamed on cattle and, this is not to say you can’t overgraze a piece of country, but a lot of things that are blamed on cattle turn out to be rodents, bears, deer, and a lot of other things going on out there. They see a cow and they think, “Oh, it is her fault.” You need to manage grazing. There is no question about it. But, you need to look at the whole picture... By and large, the Coronado has about as good a relationship with the permittees as any forest in the country....

One can readily see how the VBAs evident in these quotes form a cohesive theme. For example, behavior—ranching practiced over time and the related long-term observation—leads to knowledge about ecosystem conditions and trends, including grazing and other effects. This knowledge is used by ranchers to modify their behavior to sustain the viability of their ranching operations and accrue the resulting benefits. This can lead to development of a stewardship or conservation ethic to maintain these benefits over time. However, they believe that the Forest Service and general public do not understand the deep nature of their attachment to the land and the conservation ethic it can inspire. They also believe that there is not a market for their knowledge among the management community. As a result, they have negative attitudes toward the public and to some extent the Forest Service. This attitude may be general and not apply to specific Forest Service employees or specific individuals even if they are members of the critical public, as found in the

earliest studies of attitude mentioned earlier. The relationship with science is somewhat dualistic—the ranchers believe they know more than the scientists think they do, and have ways of understanding the land that scientists may not grasp, yet they may welcome scientific monitoring because they believe it will dispel myths about grazing impacts.

Note that we use the term “ranchers” when referring to these VBAs—yet we are only referring to those ranchers who were contacted for the study. We must be careful when describing the results of such studies, lest the reader think we are actually speaking for all ranchers in a certain population.

The quotes and associated findings suggest many possible applications to management of grazing on federal lands. For example, it would be instructive to have a group of ranchers meet with Forest Service employees and members of the public in the field, to view and discuss on-the-ground conditions, their causes, the degree to which they are believed to be a problem, and alternative ways of solving problems. Collaborative planning efforts such as watershed cooperatives have found that field visits can break down stereotypes and increase understanding of different types of values and beliefs associated with forest landscapes and uses. If no common ground emerges (and frequently it does), then at least all involved will have a better understanding of others’ values regarding the landscape and the desirability of current conditions, beliefs about the factors that led to those existing conditions, and attitudes toward possible management actions. Only by becoming aware of the values, beliefs, and attitudes of diverse forest stakeholders can we begin to craft socially acceptable management strategies.

These seven quotes represent a powerful and cohesive system of VBAs that is available for use by planners and decisionmakers. One tendency might be to overly rely on such information because it is so compelling—without testing it more carefully with other samples of ranchers. Another tendency might be to dismiss it because it’s just the views of a few individuals. Both of these applications would be incorrect. By comparing this information to that obtained from other studies, observations, and behavioral data, however, we can make informed judgments about its proper application. That is why Bright and others (2003a) suggested that, “when possible, the researcher should use multiple sources of attitudinal data to ensure the reliability and validity of the information.”

One use of the information would be to generate hypotheses that could be tested a variety of ways—perhaps by holding a few more focus groups or conducting additional interviews targeted at different types of ranchers to assess the effects of variables such as region of residence, size and nature of ranching operation,

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**Field visits can break down stereotypes and increase understanding of different types of values and beliefs associated with forest landscapes and uses.**

rancher ethnicity, degree of dependence on grazing for household income, or degree of dependence on federal lands for grazing. For example, at least one rancher commented that some ranching practices have resulted in some abuses, presumably unnecessary or excessive damage to natural resources. This would be worth pursuing—what practices are believed to be abusive, and why? Is there widespread agreement among ranchers?

Once our interest is piqued, we would probably hope to conduct a study of the ranching population in our area of interest using a random sampling procedure so we could measure the applicability of the results to the population or to various strata (groups of ranchers). We might also want to consult the literature regarding the general population’s attitudes toward ranchers, or Forest Service biologists’ VBAs regarding local knowledge held by ranchers and its possible uses. However, the ranchers’ comments and resulting themes could be used as a stand-alone source of information at any stage of planning from scoping to monitoring.

Another section of the report identified themes related to participants’ values, beliefs, and attitudes regarding the Forest Service. Participants expressed some confusion regarding the agency’s mission, scope, and planning process as well as the relationship of the agency and the lands it manages compared to other agencies such as the National Park Service or Bureau of Land Management.

Although most participants viewed this lack of knowledge about the Forest Service as unimportant “as long as they get the job done” others suggested that the agency should do a better job of defining and publicizing its mission and priorities. Participants believed that this increased public knowledge would lead to better planning.

## Considerations for Conducting Qualitative VBA Studies

Qualitative VBA studies are useful in gaining insight into (a) the primary categories of public VBAs that relate to Forest Service land management, (b) the meanings that people assign to those categories, and (c) how those fit into the potential or proposed actions under consideration by the Forest Service.

Qualitative data collection methods may be used with individuals or groups. For the purposes of this technical guide, only two general categories—interviews and focus groups—will be discussed in detail, but additional resources relating to a variety of methods and techniques are referenced in the text. As mentioned earlier, this VBA technical guide is not a primer on social research, but we will use this

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section to outline several key considerations in conducting qualitative VBA studies using interviews or focus groups. The following sections discuss topics, sampling, data collection methods, and analysis issues.

**Topics: What VBA information should we collect?—**

There is no universal answer to this question; it depends on the issues and the purpose of the VBA data collection. The first consideration is to be able to clearly define intended uses of the VBA information. If it is intended to be the basis of an inventory and future monitoring to satisfy planning requirements, for instance, the needed levels of rigor, breadth, depth, and documentation are substantially greater than if its intended use is as preparation for collaborative efforts on a NEPA project. If the VBA information is designed to help identify planning issues, then a discussion guide could contain open-ended questions to elicit a full range of VBAs. If planning issues have been identified, then VBAs can be solicited about each of the issues to help set the stage for development and analysis of management alternatives.

An efficient way to supplement existing information is to solicit information from both internal (agency and collaborators) and external (stakeholder) experts and opinion leaders on what VBAs are most relevant to the planning issues and decisions to be made. If planning is taking place in a collaborative fashion, VBAs are an ideal topic to scope out with the collaborators. An assessment of information needs and gaps should be conducted before undertaking the time and effort to collect primary data. For example, there may be adequate information available on the VBAs of some stakeholder or user groups, so the effort could focus on the others.

**Sampling: From whom should we collect information?—**

Qualitative studies typically are not designed to yield results that statistically represent the views of a broader population, but sampling is still an issue. Because the purpose is to learn more about the values, beliefs, and attitudes people hold that are relevant to a given project or plan (or to agency functioning in general, such as level of trust), it makes sense to organize the sampling effort by key population groups whose opinions you are interested in hearing (Dick 1997). Then one can contact leaders or members of those groups and ask them to participate as an interviewee or focus group member. You might select people who hold “special” knowledge, perhaps based on long-term residence near or long-term use of the area, or you may select people who have a special interest in some forest-based activity. You might

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**An efficient way to supplement existing information is to solicit information from both internal and external experts and opinion leaders.**

individually interview people who otherwise would have been part of a small group interview or a focus group but who could not fit in the schedule for the group time. A common method called “snowball” sampling involves asking interviewees or potential interviewees who else they would suggest should be interviewed.

Whatever your criteria, you will be using a purposive sampling strategy, as opposed to a probabilistic one (Patton 1987). The power of purposive sampling lies in the purposeful selection of information-rich people to represent each section of the population or group of like-minded people. It is important to have selection criteria for choosing people for an interview or a focus group. Those criteria depend on the purpose of the investigation, and the type of questions one is trying to answer. A variety of strategies exist for purposefully selecting information-rich individuals or groups (Patton 1987).

A related issue is how many people to interview. This question is often phrased as, “How can I know when I’ve collected enough data or talked to enough people?” As discussed in the case study, this will be determined in part by time and funds available, but also by the number and size of stakeholder groups or populations of interest from whom you wish to solicit VBA information. Skilled interviewers recognize that when they start to hear the same viewpoints or sets of VBAs that have been expressed before, they may already have sufficient understanding; additional interviews might not be as efficient at providing new information.

### **Methodology: How should we collect the VBA information?—**

This section describes two common methods of collecting qualitative information: individual interviews and focus groups. These methods can also be used, of course, for collecting quantitative information.

Interviews are an effective way to efficiently obtain a lot of information from one person’s perspective at a time. Some people will feel more comfortable talking in a one-on-one situation, and may express values, beliefs, or attitudes they would not state in public or with nonresearchers present. It is easy to follow up on a response by asking another question and seeing where the conversation goes.

Individual interviews are typically conducted by one or two interviewers with one individual, although other individuals are sometimes present and may or may not be incorporated into the interview. Interviews can be structured (having a uniform set of questions and procedures) or semistructured (having a general direction or set of topics, but adaptable within a procedural framework). Highly structured interviews have the advantage of ensuring that questions are asked the same way over time or by separate interviewers and that the same information is

collected about key topics. Less-structured interviews have the advantage of allowing the interviewee to roam within the list of topics, perhaps revealing information that might not have been obtained.

Interviews can take place in person, over the phone, by live computer messaging, or other means, but each requires the interviewer to actively manage the process. Interviews can appear to be simple conversations, but they are not. They require planning, record-keeping, analysis, and reporting, as well as consideration of ethical issues such as confidentiality or anonymity. Interviews, as opposed to conversations, have components of (1) concept identification and clarification, (2) hypothesis testing (for example, while interviewing you develop a working hypothesis about why an informant believes off-highway vehicle use and wilderness are incompatible and then test it), (3) consistency of perspective, and (4) relevance (staying on topic guided by strategy).

The person(s) conducting the interview should control the discussion to an appropriate level. Too much control will stifle the discussion and too little could result in a meandering conversation that frequently strays from the topic at hand and is of little use in the subsequent analysis. This is one reason why interviewing is a skilled activity that requires training. Effective interview techniques require active skill in four key areas: listening, paraphrasing, probing, and note taking (Higginbotham and Cox 1979). Having a strategy regarding the goal of the interview and understanding how interview skills work together to accomplish that goal is essential. When these skills are applied well, rapport is easier to attain. Rapport is fundamental because it is a function of showing respect for the interviewee and his or her VBAs.

It is critical to capture the information from the interview as accurately as possible. Note taking and the techniques for recording are both large topics in data collection to ensure that the data are accurate representations of what is said (see, for instance, Sanjek 1990). This activity is important for validity as well as reliability issues. As discussed further in the section on focus groups, it is often not possible to keep up with the flow of the discussion when taking notes by hand. If two interviewers are present, one may take notes while the other focuses on maintaining an even flow during the interview. A recording of the interview (with the respondent's permission) is very useful in filling in the gaps, although some highly experienced interviewers can conduct and subsequently reconstruct interviews without taking notes during the interview or recording it. Props such as maps can be used for the interviewee to draw on directly.

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**Having a strategy regarding the goal of the interview and understanding how interview skills work together to accomplish that goal is essential.**



**Focus groups—**

Focus groups are a structured group process conducted to explore people's thoughts and feelings about a particular topic or issue (Sherraden 1995). They can be useful for a variety of tasks, and have several advantages as well as limitations. The main advantage is the ability to observe the interactions that emerge among focus group members; the discussions often reveal VBAs that are new to the participants as well as to the agency. The key skill areas identified above for interviewing—listening, paraphrasing, probing, and note taking—are also applicable for conducting focus groups, as are the considerations of having a solid strategy and the development of rapport with the group. However, one must also be skilled in small group behavior to properly manage the discussion. Although focus groups are relatively easy to organize and efficient to conduct, moderation is best left to professionals. Focus groups provide an ideal opportunity for the agency to either participate as a member or to simply observe.

Focus groups are usually composed of a recorder and a moderator plus 5 to 10 people, selected purposively based upon a set of criteria. This size typically yields a variety of viewpoints and allows for full participation. Groups sometimes include as few as 4 or as many as 12 members, but smaller groups tend to be dominated by 1 or 2 people and larger groups can inhibit individual participation in the discussions.

Like interviews, focus groups can be informative at any stage of planning. They are useful early in planning when agencies want to rapidly get an understanding of key themes or issues of controversy. They are a fascinating forum for development or refinement of management alternatives. Focus groups also have utility in monitoring forest plans or project implementation as a way to gauge how people have been impacted by forest actions, or what people think about how well implementation has been accomplished compared to the plan methods and objectives.

Focus group discussions generally last from 1½ to 2 hours; longer sessions can produce fatigue and declining utility of the results. A well-managed discussion allows deep-seated feelings on a subject to emerge; it is not uncommon for people to express strong emotions, which the group must be allowed to process. As anyone who has attended a public meeting knows, emotions come to the surface when people discuss VBAs as they relate to natural resource management and national forest management.

The norm is to hold several focus groups for a given topic or area. To decide how many groups to hold requires dividing the area geographically and topically.

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**Focus groups are useful early in planning when agencies want to rapidly get an understanding of key themes or issues of controversy.**

The more divisions, the more groups needed. Morgan (1988) believed that one group is never enough as you may be observing the dynamics of that group and little else. Similar to qualitative interviews, the sampling goal is not to represent a population's VBAs statistically, but to reflect the range and depth of VBAs present.

Frequently, focus group members are provided with materials to review before the meeting, or with an interview guide that displays the topics the group is expected to cover (see example in the appendix). The purpose of the interview guide is to provide an overall direction for the discussion. It is not the equivalent of a survey instrument and is not to be followed in detail or even necessarily in order. The guide provides the moderator with topics and issues that are, to the extent possible, to be covered at some point during the group discussion. The guide is loosely structured and does not suggest potential responses. The reports on focus groups conducted in advance of forest plan revisions in the Southwestern Region (Region 3) include interview guides. Forest Service employees can obtain these guides over the Forest Service intranet from Region 3 at: Planning and Watershed, R3 USDA Forest Service Intranet ([http://fsweb.r3.fs.fed.us/eap/human\\_dimensions/index.shtml](http://fsweb.r3.fs.fed.us/eap/human_dimensions/index.shtml)).

For an extensive list of resources related to focus groups, see the University of British Columbia's School of Library, Archival, and Information Studies' Web site (UBC 2005): [http://www.slais.ubc.ca/resources/research\\_methods/group.htm](http://www.slais.ubc.ca/resources/research_methods/group.htm).

### **Analysis—**

Analysis allows us to organize the qualitative VBA information in such a way that managers, leaders, and the public in general can understand the important aspects of the results. Transcripts or notes from interviews and focus groups produce huge amounts of data, only a fragment of which is useful in getting at what Forest Service decisionmakers need to know. Data reduction should be guided primarily by the need to address the questions for which the investigation was initiated. In other words, the analysis should be focused on the objectives of the study. This reduction of information is hard for at least two reasons: qualitative data can be very rich and fascinating in and of itself, and the person who analyzes the data has often played a direct, personal role in collecting them.

Display of qualitative data typically relies heavily on some type of categorization of the responses, coupled with ample use of quotes and stories obtained to illustrate the depth and breadth of each category, and how it relates to the issue at hand. Information on VBAs is especially amenable to this type of analysis, because the linking of values, beliefs, and attitudes tells a particular story from a particular viewpoint.

Many software packages for analysis of qualitative data have been developed in recent years. Many available packages were reviewed by Weitzman and Miles (1995) over 10 years ago. Even though there are many new tools available and Internet sources abound, their grouping is still useful. They found six types: word processors, word retrievers, textbase managers, code-and-retrieve programs, code-based theory builders, and conceptual network builders. All have strengths and weaknesses; Weitzman and Miles (1995) suggested that when selecting a given package, researchers should think about the amount, types, and sources of data to be analyzed and the types of analyses that will be performed.

Analysts cannot depend on their computers to produce quality conclusions. Although software can greatly aid in the organization, retrieval, and pattern-recognition in qualitative data, it is still up to the analyst to dig into the patterns and extract the elements that make sense for explanation. The National Science Foundation (NSF) online publication *User-Friendly Handbook for Mixed Method Evaluations* (Frechtling and Sharp 1997) offers additional cautions:

Two caveats are in order. First, computer software packages for qualitative data analysis essentially aid in the manipulation of relevant segments of text. While helpful in marking, coding, and moving data segments more quickly and efficiently than can be done manually, the software cannot determine meaningful categories for coding and analysis or define salient themes or factors. In qualitative analysis, as seen above, concepts must take precedence over mechanics: the analytic underpinnings of the procedures must still be supplied by the analyst. Software packages cannot and should not be used as a way of evading the hard intellectual labor of qualitative analysis. Second, since it takes time and resources to become adept in utilizing a given software package and learning its peculiarities, researchers may want to consider whether the scope of their project, or their ongoing needs, truly warrant the investment... Validity means something different in this context than in quantitative evaluation, where it is a technical term that refers quite specifically to whether a given construct measures what it purports to measure. Here validity encompasses a much broader concern for whether the conclusions being drawn from the data are credible, defensible, warranted, and able to withstand alternative explanations.

It is highly rewarding to creatively identify topics and VBAs, to find patterns in the data, and to specify their possible applications to the decision at hand. However, applied incorrectly, they may lead to conclusions beyond those warranted by the

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**Analysts cannot depend on their computers to produce quality conclusions. It is still up to the analyst to dig into the patterns and extract the elements that make sense for explanation.**

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**Sampling is a key issue because we want to say that the results represent an entire population.**

data or to implications that are more imaginary than real. This is where training, professional ethics, experience, and peer review come into play—being systematic and thorough in exploring the connections and associations of variables.

## Conducting Quantitative VBA Studies

This section will focus on surveys as a method of collecting quantitative VBA data from a representative sample of a population. The objective of survey research typically is to quantify, in a statistically defensible manner, the relevant characteristics of a population of interest. Sampling is a key issue because we want to say that the results, based on the people we sample, represent an entire population. We will see how the purposes, methods, type of data collected, and applicability to resource decisions typically differ from those associated with qualitative studies, and why the two approaches are complementary.

### Quantitative VBA Case Study

To explore the intricacies of quantitative research on VBAs, we will focus on a topic of great current interest—fires and their management on national forest and other public lands—and examine two research efforts that together form a quantitative case study.

The first study explored the underlying bases for why people feel the way they do about wildland fire (Bright and others 2003b). Like many studies, it was a quest to understand whether people’s attitudes toward wildland fire and the fire management practices of the Forest Service (and other agencies) can be predicted by understanding their fundamental beliefs about wildland fire and their associated values. This study thus gets at the root of many VBA studies and their value to forest planners and managers:

Perceptions of fire management are ultimately rooted in the fundamental values that individuals hold. It therefore follows that forest managers need to understand how values relate to perceptions about fire management issues such as prescribed fire, fuel treatments, fire suppression, and post-fire forest health issues...an individual’s fundamental values are oriented to specific wildfire management issues by basic beliefs about wildfire management. These basic beliefs, representing value-laden perceptions of wildfire management, directly influence attitudes and norms regarding specific wildfire management issues. In turn, attitudes and norms have a

direct impact on behaviors related to wildfire management such as the development of “defensible space” around one’s residence or support for agency fire management actions such as prescribed burns and mechanical thinning [Bright and others 2003b: 18].

With this framework in mind, the authors set out to develop a scale that could be used to measure people’s basic beliefs that should aid prediction of attitudes, norms, and behavior related to specific wildfire management issues. They then used the scale to measure forest visitors’ fire orientations. This case study is an example of not only the methodological considerations associated with quantitative studies, but of a common way social researchers develop a set of questions.

Social scientists have a long history of developing scales to increase our understanding of values, beliefs, and attitudes. Typically, a scale consists of a number of items (questions) to which people respond using a 5-point (or n-point) response format. The responses are then summed or otherwise manipulated to yield a single score on the scale. This measure is referred to as a Likert scale, named for its developer, psychologist Rensis Likert, who founded the well-known Institute for Social Research at the University of Michigan. Such scales are useful because social scientists have learned that an individual’s response to a single question may not have much predictive value—it is too simplistic to describe what is typically a multidimensional phenomenon such as a value. Scales can tap into a number of dimensions of a specific belief or value, increasing their predictive ability. Researchers have put incredible effort into developing scales measuring all types of VBAs (and other constructs such as social norms, behavioral intentions, or behaviors). Once developed, the scale can be used in different settings and in conjunction with other measures; researchers interested in studying the same topic do not have to develop their own scale—they can apply the one already developed. Scales facilitate comparative or cross-cultural studies by comparing how two different populations answered the same set of questions. Researchers have developed many scales that measure people’s values, beliefs, and attitudes relevant to national forest planning and management.

It should be pointed out that the Likert scale is actually an ordinal, rather than an interval scale of measurement because points on the scale clearly are rankable (“strongly agree” is a stronger opinion than “agree”), but the difference between two points on the scale are not necessarily equivalent (the difference between “agree” and “strongly agree” is not necessarily the same as the distance between

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**Researchers have developed many scales that measure people’s values, beliefs, and attitudes relevant to national forest planning and management.**

“agree” and “neutral”). However, in practice the response format (whether 5, 7, or 10 points) is treated as an interval scale so average scores (means) can be computed and reported. Typically, numbers are used to represent responses (as in the NSRE examples), reinforcing that the resulting responses will be treated as interval-level measurements.

The authors began development of their scale by reviewing the literature on public perceptions of wildfire management as well as the literature on values to see what types of value orientations might help explain beliefs about fires. They identified six wildfire management basic belief dimensions believed to “represent key value-based dimensions proposed to drive public perceptions of wildfire management issues.”

The first two dimensions identified have been commonly used to explain differences in perceptions of natural resources and their management: an **anthropocentric** dimension that reflects the extent to which the role of humans is of primary concern regarding natural resource and environmental management; and a **biocentric** dimension which reflects the extent to which the health and welfare of ecosystems and their components are of primary concern.

The next three dimensions were borrowed from Rokeach (1973): **responsibility** (in this case, who is responsible for protecting homes built in or near the urban-wildland interface and who is responsible for managing the risk of wildfire); **capable/trust** (in this case, the extent to which the public “trusts” the ability of public agencies to effectively manage wildfire) and **freedom** (in this case, the extent to which private landowners should be free to build or constrained from building private residences in or near the urban-wildland interface where wildfire may occur). The sixth basic belief dimension, **benefit/harm**, addressed the extent to which the public perceived a place for wildfire in natural processes—whether wildfire is beneficial or harmful to nature.

The process of developing a new scale always begins with a literature review to reveal concepts related to what the scale measures. Here the authors chose six underlying dimensions that theory and research suggested would have the ability to explain why people have different perceptions of wildfires and how they should be managed. This does not mean that these are the only six dimensions that could have been tested or that they were the best set—they just provided a reasonable starting point. Their ultimate value in explaining perceptions of wildfires will be

determined by how well they perform when tested. If they turn out to be unrelated to, say, preferences for management of wildfires by the Forest Service, then the researchers would start over with a different set of hypothesized underlying dimensions.

The authors first tested the scale items using 200 Colorado State University students to assess the characteristics of the items and the resulting scales. Then, they moved on to their target populations—visitors to the Arapaho-Roosevelt National Forest in north-central Colorado near Denver; the Mount Baker-Snoqualmie National Forest in western Washington near Seattle; and the San Bernardino National Forest in southern California near Los Angeles. The three forests were chosen because they were each located close to an urban center in the Western United States.

The description of the methodology used brings up many issues associated with quantitative research. To assess the basic characteristics and qualities of the measure itself, a convenience sample of Colorado State University (CSU) students was used—it does not really matter how they were chosen because we're not interested in generalizing the results to all CSU students, or all college students. Instead, the purpose of the initial testing was to assess the measure itself, and to see whether variables were related to each other as hypothesized. College students are commonly used as subjects in experiments or to test survey instruments because they are plentiful and readily available. Many universities require introductory psychology students to be available to serve as "subject pools" for social research being conducted by university professors. However, note that there could be something different about how college students cognitively view the items and the relationships among them compared to the population of interest (forest visitors).

Visitors to each forest were approached and, after responding to a one-page onsite survey, were asked if they would be willing to complete a mailed questionnaire about perceptions of wildfire and its management. A total of 3,131 individuals were approached across the three forests; 2,762 provided names and addresses of which 2,530 were usable and deliverable.

First, note that quantitative studies that attempt to represent the views of a population typically involve collecting information from a larger amount of people than do qualitative studies, which are less concerned about the statistical representativeness of the results. Therefore, we usually see much larger sample sizes in quantitative studies than in qualitative studies. This also has repercussions for the type of information collected; with a sample size this large, the researcher is

probably going to use a statistical package to analyze results using response formats that are easily analyzable, as opposed to the formidable chore of analyzing extensive verbal responses from thousands of people (although there are certainly computer packages available for that purpose).

The sampling procedure is more important, because we are interested in the views of forest visitors in general—not just the ones we happened to run into. The sampling details are not provided here, but one could easily imagine the importance of how the visitors were identified. For example, one convenient method might be to contact visitors at car campgrounds; many people would be concentrated in one area, so contacting people would be efficient. Even easier might be contacting people at a major visitor center. Another option might be contacting people at trail heads. Researchers would likely want to use a combination of sampling locations, because car campers, visitor center visitors, trail users (and, say, day users vs. multiday wilderness visitors) would be expected to have systematic differences in their belief and value dimensions with respect to natural resources and fire management. For example, wilderness visitors could be hypothesized to have a more biocentric orientation than car campers. A way to account for these differences would be to analyze the results separately for separate visitor types, and then identify the similarities and differences across activity groups.

Another concern is the response rate—the proportion of people contacted who actually participate. In this case, 88 percent of the people contacted provided their names and addresses and (apparently) completed the brief onsite survey form. This is an excellent rate of response, which would lead us to conclude in most cases that we do not have to worry about whether the 12 percent who said no differed systematically from those who agreed to participate. If the proportion were 50-50, however, we might be more concerned whether our sample represented the population of forest visitors. If 80 percent of the people had refused, we would really have to evaluate whether to continue the research—or perhaps hire a new set of people to contact visitors.

Face-to-face methods of contacting potential respondents usually yield a higher rate of response (or compliance) than telephone or mail surveys because the transaction is more personal—you are refusing to comply with a personal request, not just tossing an envelope in the trash or hanging up the phone. Another factor in this case was the small amount of time and information requested onsite, which made compliance relatively easy. Of course, the down side with onsite interviews in recreation settings is that people may not want to stop what they are doing even for a short time; they are recreating and may be eager to get down the trail.

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The authors then sent out a mail survey using a variation of the approach suggested by Dillman (2000). Their procedure involved mailing out a questionnaire and a cover letter, sending a reminder postcard to everyone 2 weeks later, and then, 2 weeks after the postcard, sending out another copy of the questionnaire and a slightly different cover letter to those who had not yet responded. This approach yielded a response rate of 51 percent, although the rates of response were different for each set of forest visitors. The authors then did a check on nonresponse bias by comparing the onsite responses of people who did and did not return the mail questionnaire. Using a statistical test, they determined that the two groups did not differ sufficiently to warrant concern; “non-response bias was thus not considered to be a problem and the data were not weighted.”

When it comes to mail, telephone, personal interview, or other types of surveys, Dillman’s techniques have been the standard for decades. The approach includes not just the timing and number of mailouts, but question order and wording, questionnaire layout and format, cover letter contents, the folding of the cover letter and questionnaire into the envelope, the provision for return of the survey, and the envelope appearance itself. There are infinite variations of the approach, but the basic method and its premises have been employed in countless studies of VBAs. Many have summed up their experience with the approach and its ability to garner high response rates and quality information by simply saying, “It’s like magic.”

For mail surveys, a 51-percent rate of response would be viewed as acceptable by many researchers, although many “Dillman” surveys have generated response rates of 70 to 85 percent. In addition, when an onsite contact precedes a mail survey, response rates are usually higher than without the onsite contact. The personal nature of the initial onsite transaction gives people an added motivation for responding to the mail survey. There could be many reasons why nearly half of the people chose not to complete and return the mail survey. The salience of the survey topic to the respondent can be a key factor; people who do not know or do not care much about the topic may choose not to respond. The differential response rates by forest could suggest that fire may be a more salient topic in some forests than in others, or perhaps the forest visitors themselves differed in ways that facilitated or hampered their responses.

Regardless of the reason, the authors conducted a check to see if people who responded differed in any systematic way from those who did not respond. In this case, that option was available because all of the potential respondents had provided

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**When it comes to surveys, Dillman’s techniques have been the standard for decades.**

a limited amount of information onsite. Not only did this permit the comparison of respondents with nonrespondents, but it meant that at least some information was collected from everyone. If the two groups of people (respondents and nonrespondents) had very different responses to the onsite questions, then it is likely that a certain type of person chose not to respond to the mail survey—a sign that the results may be biased. If the people who did not return the mail survey completed the onsite survey pretty much the same way as responders, then nonresponse to the mail survey would be assumed to be random, and results less likely to be biased. The hope of every researcher conducting such a check is that there will be no evidence of nonresponse bias. Even so, it is possible that the respondents and nonrespondents can differ in systematic ways based on personal characteristics or other variables that were not available for the comparison.

Suppose, however, that the nonresponse check found that response rates were much higher for women than for men. This would suggest that the mail survey results would not represent the views of forest visitors because men are under-represented in the sample of completed questionnaires. One way to address this issue would be to weight the responses of men so the proportion of male responses would resemble the proportion of men in the population of forest visitors. That is the type of possibility the authors are referring to when they say they did not have to weight the data. Of course, the researcher would first check to see whether the views of men and women differed on the key variables—if there was no difference, then the results would not have to be weighted.

The main purpose of the study was to develop one or more scales that would be useful to understand peoples' values, beliefs, and attitudes relevant to wildfire management. The results suggested that there are several important dimensions that underlie peoples' attitudes toward any possible fire management techniques. Scores on the first dimension, called "biocentric," reflected the extent to which people believe that nature, forests, and wildlife have as much of a right to exist as do people. The second, "anthropocentric," (often referred to as utilitarian) reflects the belief that the primary purpose of nature, forests, or wildlife is to be of use to people.

These two beliefs are often found to be negatively correlated—in other words, people who have higher scores on one scale have lower scores on the other. One can see how this basic belief dimension could also be called a value, because it reflects a preference for how something should be. Many studies have used this same anthropocentric/biocentric dimension to explain attitudes toward wildlife management, timber management, and other types of issues commonly facing the

Forest Service. One can see how they could be linked to other basic value/belief dimensions, such as environmentalism. This is one utility of knowing about people's values or beliefs—they can explain a whole set of attitudes toward forest management actions, or explain a wide range of behaviors.

In this case, each scale consisted of several separate questions, with people indicating the strength of their belief on a multipoint scale, from strongly agree to strongly disagree. If an item did not correlate with the others, it was dropped from the scale. Researchers typically develop Likert scales by studying item-total correlations; responses to each item (question) are correlated with the total score obtained by adding up the individual responses, after each possible response is coded with a number. Sometimes, if space on a survey form is at a premium, researchers will not include the whole scale (set of questions) on the survey, but will just use the one question that has the highest item-total correlation, or the question among those having the highest item-total correlations that best represents the overall belief being measured.

The third dimension was “responsibility,” which included questions about whose responsibility it is to protect homeowners from wildfire—the homeowner or the government. One question on the scale was, “When people build homes near forests, it is their own fault if their home is damaged by wildfire.” Other questions had similar wording, but voiced the opposite belief that government agencies should be responsible for protecting homes from wildfire: “When people build homes near forests, they have the right to expect their home will be protected from wildfire by the government agency managing the forest.” The fourth belief dimension was called “freedom” because it contained items such as “People should be allowed to build homes where they want, even if it is in a high wildfire zone” or alternatively worded items such as, “Laws should prohibit building homes where they can be burned by wildfires.”

One might expect responsibility and freedom to be related to each other; we typically hear things like, “With freedom comes responsibility.” Freedom of speech, for example, does not permit one to say things that instigate a riot—requiring responsible use of that particular freedom. For example, the belief that people should be able to build a house in a high-risk wildfire area is consistent with the belief that the landowner should take responsibility for reducing the risk to his or her home by cutting down dead trees, clearing vegetation, and taking other measures to protect their homes. Forestry extension agents provide information to homeowners in case they are not aware of such actions—or perhaps even

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**Knowing peoples' behavior and their experiences can help to predict their values, beliefs, and attitudes.**

not aware that a home in the woods is prone to being destroyed by wildfire. Many surveys aimed at understanding peoples' VBAs associated with wildfires therefore ask about peoples' experiences with wildfires, such as whether they have ever seen or been affected by a wildfire, or know someone who has. These experiences have the potential to quickly change peoples' VBAs associated with wildfire. Thus not only values, beliefs, and attitudes help to predict behavior—but knowing peoples' behavior and their experiences can help to predict their values, beliefs, and attitudes.

Many scales (and many groups of questions that will be analyzed individually rather than additively but are all included on the same page of a questionnaire) contain items that are reverse-coded. This means that someone responding “strongly agree” to one question will have to respond “strongly disagree” to another for their opinion to be consistent. Researchers do this to avoid response set bias—people simply moving down a list of items and checking the same response to each one. It requires people to read and think about each question individually to pick the response that best represents their own attitude, belief, or value. Of course, people can be inconsistent in their own values, beliefs, and attitudes—or people can have varying reasons for why a belief that appears inconsistent with another belief is actually consistent, perhaps based on underlying consistency with an even more basic value.

The fifth dimension, called “capable/trust,” reflects a set of beliefs that are closer to what we think of as attitudes toward fire management practices. One item on this scale was, “Setting prescribed fires in order to decrease the threat of future wildfire is an appropriate strategy for managing forests.”

Judgments about the appropriateness of a certain behavior can be a belief or an attitude; this question has elements of both. The question may be more complex than it seems. First, it introduces the idea of prescribed fires, which people may or may not know much about. Most researchers would therefore include a question about peoples' familiarity with (knowledge about) prescribed fires, or ask what they have heard or read about them. The question also assumes that the respondent agrees that prescribed fires “decrease the threat of future wildfire” rather than asking them if they believe this is true or not. Finally, the question asks whether setting prescribed fires is “an appropriate strategy for managing forests.” People could conceivably agree with part of the question but disagree with other parts, so they would not be sure how to respond. This is not an egregious example, but it

serves to show that “double-barreled” questions, which contain several components with which one could agree or disagree, should be avoided. It’s better to split up such questions into more than one question.

Another related issue is that people could support the idea of prescribed fires, and believe they can prevent devastating wildfires, but not trust the Forest Service or other agency to properly implement them. Indeed, one study found that, after a notorious prescribed fire became a wildfire when it went out of control, the neighboring public still believed that the prescribed burn technique was useful, but did not trust the agency to do it right. Thus the “trust” aspect of this dimension probably is broader than the question measures.

The final dimension identified, called “benefit/harm,” measured whether people believed that wildfires in “National Forests, Parks, and other natural areas” were: “Bad/Good; Harmful/Beneficial; and Negative/Positive.”

The public’s belief that wildfire is inherently good or bad has the potential to predict not only attitudes toward fire and its management but a range of other VBAs. The image of wildfire can certainly be a threatening one, and decades of an effective public information campaign convinced many members of the public that forest fires were a desirable thing to prevent: “Only you can prevent forest fires.” Accompanying decades of fire suppression practices, however, led to a buildup of fuels on many national forests, increasing the risk of bigger fires that could easily encroach on the increasing number of homes in the interface area. With this message, it is easy to see how the agency and the public alike could lose track of fire as a functional component of the ecosystem, started not only by careless individuals or landowners who wished to clear forested areas, but by natural events such as lightning. Ideally, such attitude questions would be followed by open-ended questions designed to probe the reasons behind peoples’ favorable or unfavorable attitudes toward wildfire.

This question is perhaps the closest to a straight measurement of attitude than any of the others, because it is clearly an evaluative dimension. However, it also contains elements of a belief because it reflects what a person considers to be true or not. Note that the question is quite general, so it may not accurately reflect peoples’ attitudes toward a specific wildfire—say, a wildfire that burned in a remote area with no loss of life or property compared to one that burned down hundreds of homes and resulted in significant loss of life. People may believe that fires in national forests are good, but fires in national parks are bad. Answers to the question might not be expected to predict responses to a specific situation because it

is so broad and all-encompassing—yet it may have some level of predictive value. We would have to conduct another study to find out, or review the literature to see whether a consistent finding emerged, and under what conditions.

This question also points out another interesting aspect of VBA questions—that responses are likely to differ based on when the question is asked. For example, it's easy to predict that responses would change after a devastating wildfire has swept through the surrounding area. One could not ask the question under such circumstances and expect the responses to generalize to all national forest communities. Under what circumstances are values and beliefs really consistent, and for whom? Those are the types of questions we can answer with properly conducted research on VBAs.

By studying the relationships among these six dimensions, perhaps in various parts of the country and among varying populations of communities associated—or not associated—with national forests, we can gain a better understanding of the ability of these belief dimensions in understanding why people feel the way they do about wildfires, and then begin to consider those beliefs in both our management measures and how we choose to communicate them to the public. To this utility, many would add “And how we educate the public so they understand the science behind our management actions.” It should be apparent by now that we should be cautious about this goal and expectations for its success!

The authors noted that although their study addressed the content and construct validity of the basic belief scales, the scale's usefulness to forest managers depends on how well the results predict attitudes toward fire management policies or norms for acceptable agency reactions to wildfire (which was assessed in a companion set of analyses).

They concluded that their scales provided Forest Service personnel with a good way to measure public values, beliefs, and attitudes regarding wildfire. But they acknowledged that more research needed to be conducted:

Finally, while fundamental values do not differ greatly within a society, the orientation of those values, measured using basic beliefs, may differ. Additional research should examine factors that are correlated with such differences. For example, do people who live in the Western U.S. hold different basic beliefs about wildfire management than people in the Eastern U.S.? Do age and life stage influence basic beliefs about wildfire management? Does residence (urban versus rural) or the type of home ownership (primary versus

second home ownership) influence basic beliefs and the orientation of values toward wildfire management? Research on wildlife basic beliefs and value orientations has supported the notion that there are differences across segments of society and that these differences do predict preferences for specific wildlife management actions. It is reasonable to suspect that the same differences can be identified regarding perceptions of wildfire management [Bright and others 2003b: 25].

A quantitative study conducted by Forest Service scientists and their colleagues addressed these questions (Bowker and others 2005):

This study focuses on the broad topic of public values, attitudes, and behaviors toward wildfire. More specifically, this study is intended to contribute to development of a comprehensive understanding of public values, attitudes and behaviors and to understanding public preferences related to fire and wildland management. Unlike previous and ongoing research, the current study is aimed to provide national or “macro” level information. The primary project objectives are to:

1. Obtain knowledge, attitude, and preference information from the general public regarding fire, fire risk, and fire management in wildland and wildland/urban interface areas;
2. Identify and measure factors which condition individual responses toward fire, fire risk, and fire management;
3. Test hypotheses relating to various social strata and fire knowledge and preferences;
4. Identify and develop market segments that can be specifically targeted by education and outreach efforts designed to enhance public understanding and support for science-based fire management regimes.

This introduction to the research tells us much about measurement of VBAs and why they are worth studying. For example, wildfires are stratified by where they occur—wildlands and the wildland/urban interface area—suggesting that measuring attitudes and values regarding any wildfire may not generalize to fires in specific areas. The study will look for individual differences and social strata (perhaps such variables as region of residence, gender, age, education, income, ethnicity) that help to distinguish one person’s responses from another, as well as differences in experiences with various types of fires.

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**Much research in the field of human dimensions has attempted to develop market segments to be considered a single audience for agency outreach and education efforts.**

Finally, the study has a very specific purpose—to identify market segments that can be targeted for the purpose of increasing public support for agency actions regarding wildfires. Much research in the field of human dimensions has attempted to develop market segments—groups of visitors or the public who possess similarities in terms of their attitudes, beliefs, values, and behaviors that allow them to be considered a single audience for agency outreach and education efforts.

Data were collected by adding a special fire-related module to the National Survey on Recreation and the Environment (NSRE 2000) mentioned earlier in this report. The NSRE2000 survey ran from 1999 to 2004, conducting more than 85,000 interviews using 18 separate versions of the questionnaire and a stratified random sampling procedure. The sample was designed to enable development of state-level population parameter estimates related to recreation behavior. The Survey Research Center at the University of Tennessee, Knoxville conducted the survey by telephone using a random digit dialing approach. [Bowker and others 2005].

In this brief summary of the methodology, we see many characteristics of a quantitative survey, including a large sample size, the desire to generalize to a broad geographic population, and administration by telephone. We will expect to see the results coded and entered in a way facilitating statistical analysis, and response formats consistent with that approach (that is, a minimum of open-ended questions, and which are divided into a discrete number of categories).

The authors provided additional detail on why information on public values, beliefs, and attitudes is critical for fire management practices that are understood and accepted by the public:

It is well known in the science community that fire is an integral component in the balance of nature necessary to maintain forest health and sustainability. However, much of the public's attitude toward fire as an important part of natural processes has been misguided, either through ignorance or through programs perpetuating public fear and misunderstanding of the vital role of fire in wildland ecosystems. Moreover, as the population encroaches further into wilderness areas, expanding the wildland urban interface, fire management becomes increasingly complex. Publicity is often very negative, with homeowners and developers advocating fire suppression to protect their investments. Unfortunately, this leads to fuel



build-ups, which eventually are the cause of bigger and more catastrophic fires with devastating consequences...Ultimately, workable management solutions to the growing fire problem in wildlands and the wildland/urban interface will require restoring fire to some degree and developing programs that gain public support of fire...

The findings section stated that, although public opinions related to fire management practices on large forests or public lands were mixed, some basic themes emerged regarding prescribed fire, government fire management, and personal responsibility. For example, 58 percent of respondents felt that all wildfires should be put out regardless of location, but 69 percent agreed that people choosing to live near rangelands and forests should accept the inherent risk, suggesting a prevalent buyer-beware attitude on the part of the general public. Respondents also agreed by a 4 to 1 margin that, where wildfire is common, homeowners should have to follow government guidelines to manage for wildfire risk. To the authors, this suggested that although personal responsibility was valued, government involvement, at least in the form of guidelines, was strongly supported by the public.

Public trust and confidence in public land management agencies' ability to manage wildfire was addressed by a number of questions. About two-thirds of the respondents believed that public land managers and forest professionals could be trusted to select the best methods to deal with wildfire. About one-third were "not concerned" about public land managers' ability to manage for fire in forests and rangelands, while just over one-third were "concerned" about agencies' ability. This suggested that although trust does not appear to be an issue, ability and perhaps capacity is still a public concern.

## **Considerations for Conducting Quantitative VBA Studies**

The quantitative case study demonstrates that undertaking a survey can be a complicated endeavor. Long-range planning is necessary for conducting a survey, resulting in higher costs and longer time requirements compared to qualitative studies. The first thing to think about in determining whether or how to conduct a survey is what resources are available to commit to the information collection

effort. As pointed out in the “Introduction,” there are legal reasons and good planning reasons to collect information about public VBAs and to be able to use that information in decisions and management actions.

Salant and Dillman (1994) suggested the following be considered when determining whether or how to develop a survey:

- How many people are available to work on the survey, and do they have experience doing this?
- How much time is available for survey design, administration, and analysis?
- Are survey experts available within the Forest Service to assist? If not, are funds available to hire a contractor to assist with this effort?
- Do you have adequate facilities and materials to conduct a survey; for example, equipment and staff available to conduct a telephone survey?

Once it has been decided that a survey is needed, it should not be surprising that primary considerations for conducting quantitative VBA studies are similar to those discussed for qualitative studies—what topics to cover, who to sample, and how to analyze and report the data. Additional considerations more salient to surveys are survey method and questionnaire design.

**Topics: What VBA information should we collect?—**

Ideally, before making the decision to conduct a population survey, you will already have conducted some type of inquiry into the range and depth of public VBAs regarding relevant planning issues and topics. You may already be aware of the topics of greatest concern to people, and have determined reasons for their concern. However, your existing knowledge may only represent information about VBAs from a small subset of the population, such as a subset of recreation visitors, or residents of a local community adjacent to the forest.

You also may have information from interviews or focus groups within the population of interest, an ideal way to lay the groundwork for a survey. Once VBAs have been identified through qualitative studies, one can assess their patterns within a broader population by conducting a survey.

**Sampling: From whom should we collect information?—**

Because VBA surveys are designed to generalize results to a population of interest, sampling is critical. A statistician may be needed to help determine an appropriate sample population and size. A population is defined based on whose VBAs are of

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**Ideally, you will have already conducted an inquiry regarding planning issues and topics.**

interest. For example, in one recent effort, Region 3 planners decided to obtain the VBAs (and other variables of interest) of two populations:

- Local residents, defined as those living within a 50-mile radius of forest and grassland borders.
- Residents in the entire area covered by the Forest Service Southwest Region.

In trying to define the population for a study, the following questions should be considered:

1. Whose VBAs are you interested in? Is it people from:
  - Communities surrounding the forest?
  - Households within a specified radius around a forest?
  - Urban centers within a specified proximity of the forest?
  - Anywhere in the state? Anywhere in the Nation?
  - Forest visitors, who could come from anywhere?
2. Are there other characteristics to consider? Are the people you are contacting:
  - Individuals?
  - Households?
  - Of a particular age, gender, ethnicity, or race?
  - Only able to communicate in a language other than English?
  - Members of a particular stakeholder group?

Once the population of interest is defined, a sample from that population must be drawn in a nonbiased way so that each person in the population has an equal (or at least known) chance of being selected. This is called probability sampling. This usually involves a search for a sample frame—a list of the people in the population. For instance, one could obtain a list of all registered voters or use listings from the local phone book. Campground users could be sampled from a campground registration list if all campers are required to sign in. Permit lists may also serve as sample frames. Many businesses who sell samples also exist. Samples can be person-based or household-based, in which case the sample would consist of households or mailing addresses.

Another option is whether to use a simple random sample or a stratified sample. A stratified sample is often used when distinct segments of a population are assumed to exist; a random sample is then selected from each of the subgroups. Strata for a sample could include:

- Urban (vs. rural) residence
- Community or place of residence
- Income
- Race or ethnic origin
- Age or gender
- Activity participation or forest travel mode (for recreation visitors)
- Membership in a stakeholder group
- Type of forest user (rancher, timber industry employee, special products harvester)

**Methodology: How should we collect the VBA information?—**

Surveys may be implemented through a variety of methods, each of which has its own set of strengths and weaknesses. The Forest Service Information Collection Web site contains useful information on survey techniques ([http://www.fs.fed.us/institute/about/design\\_qual.html](http://www.fs.fed.us/institute/about/design_qual.html)).

Survey administration techniques include telephone, mail-out mail-back, Web-based, drop-off, in-person methods, and a combination of one or more techniques. One major contrast is whether the survey is self-administered (as in a mail or Web-based survey) or given by an interviewer (face to face or over the phone). Although it is best to use the same tool for every person in a sample for consistency and reliability, some administration options might work better in some situations than others. Decisions about which method to use depend on a number of variables that the researcher must consider: sampling, type of population to be surveyed, structure of the questions to be asked, content of questions to be asked, survey organization, pretesting the survey, desired response rates, cost, facilities available, and length of time for data collection (Bright and others 2003a discussed each of these factors in detail).

Frequently, multiple information collection techniques are employed when administering a survey. For example, the survey might be implemented via a mass mailing followed by telephone inquiries to nonrespondents, or by sending a questionnaire to people who have been contacted onsite. Table 4 contains a comparison of the relative advantages and disadvantages of these techniques for administering surveys.

With quantitative studies, especially when self-administered or conducted remotely (such as by telephone), rates of response and ways of dealing with nonresponse are important considerations. This is less of an issue in most qualitative studies and face-to-face surveys because people are more apt to comply. Many

**Table 4—Comparison of methods**

<b>Performance characteristic</b>	<b>Mail questionnaire</b>	<b>Telephone survey</b>	<b>Personal interview</b>
Cost	1	2	4
Personnel requirements— interviewers	NA	3	4
Personnel requirements— supervisors	2	4	3
Implementation time	4	1	4
Sample coverage	3	1	1
Response rate— general public	4	2	2
Refusal rate	Unknown	3	3
Noncontact/nonaccessibility	2	2	3
Ability to obtain a response from an elite	4	2	1
Control over who is respondent within household	4	2	2
Interviewer control over data collection	4	1	3
Likelihood of socially desired response	1	3	4
Item nonresponse	3	3	2
Length of questionnaire— impact on response	3	2	1
Confidentiality/anonymity	4	4	4
Ability to ask sensitive questions	2	2	1
Ability to probe	4	2	1
Ability to clarify	4	2	1
Complex questions	3	3	1
Open-ended questions	4	1	1
Visual aids	2	4	1

Ranking: 1 = major advantage; 2 = minor advantage; 3 = minor disadvantage; 4 = major disadvantage.

Source: Bright and others 2003a.

of the techniques described below are designed to motivate people to respond to mail and phone surveys. After all, we are relying on people's ability and willingness to respond to our survey and to individual questions within the survey. Low response rates can introduce bias into the results if a certain type of person consistently chooses not to respond, rather than nonresponse being randomly distributed within the sample population. Most surveys incorporate a mechanism to test whether low response rates, if obtained, are a source of bias. For example, if people are initially contacted in the field and then asked to complete a mailed questionnaire back at home, their responses to the onsite survey can be used to check for nonresponse bias. Previous contact in the field (or by another method) would be expected to increase the rate of return for the mail survey, another advantage of using multiple administration methods.

#### **Questionnaire design—**

Questionnaire design is best learned through experience, so if you are not experienced, seek a skilled mentor, partner, or contractor. Entire books are written on questionnaire design; as with other aspects of research methods described in this guide, we will cover only a few key points and encourage you to learn more through the supplied references. Key considerations include question wording, response formats, question order and sensitivity, and questionnaire appearance. All of these address the main goals of avoiding bias while facilitating people's participation in the study. This will be easier, of course, if the population is motivated to participate because they have a vested interest in having their VBAs available for consideration regarding decisions about which they care. Many of the considerations are interrelated, and related as well to the method of survey administration. Make no mistake—how we ask a question, where it occurs on the questionnaire, and other aspects directly influence the responses.

It is usually easy to identify general VBA topics you wish to cover on a survey, but far more difficult to translate those topics into a set of specific questions. There are countless questions that can be developed to collect a given piece of information. Regardless of method of administration, questions must be clear, simple, and understandable to the respondent population. This is especially true for self-administered surveys, such as mail surveys, where you aren't there to answer questions, probe vague responses, or provide additional direction and definition.

Questions should be designed to avoid bias or lead a respondent to answer a certain way. Information can be provided through a lead-in statement—sometimes we have to explain a question or inform the respondent about an issue before asking it.

Response formats are another important consideration. Questions generally take one of three forms: open-ended questions, closed-ended questions, and partially closed-ended questions. Open-ended questions allow the respondent to answer the question in their own words, typically in a blank space or set of lines provided on the survey form. If a telephone or face-to-face survey is being conducted, the interviewer will have to write down or record the verbal response. Open-ended questions can provide a nice qualitative balance to the closed-ended questions that usually dominate surveys. They are used either when the researcher is not sure how people will answer the question or when a broad range of responses is possible. Open-ended questions also allow respondents to be thoughtful, creative, or provide responses that are not anticipated—benefits of qualitative studies described earlier. Open-ended responses can provide quotes that are used in the report to illustrate the range and types of values, beliefs, and attitudes present in a population or provide interpretation for quantitative findings.

Closed-ended questions can take many forms, but in all cases the respondent is provided with a statement and a set or range of possible responses and is asked to select one, rank them, or otherwise choose among them. Closed-ended questions are used when the range of responses is known or can be easily predefined. For example, we would not ask people which of five reasons they have for opposing clearcuts unless we were sure that those five options encompassed all of the possible reasons. If in addition to the five responses, we provided space for people to provide any “other” reasons they have for opposing clearcuts, that would be a partially closed-ended question. We could also ask people to explain in their own words why they answered a question a certain way. These questions thus provide a way of allowing for unanticipated responses or for further illuminating closed-ended responses.

Attitude questions (like those used in the “Attitudes” section), are frequently accompanied by a range of options such as “strongly favor,” “favor,” “oppose,” “strongly oppose,” and one or more types of “not sure” options. The purpose of these scales, often referred to as Likert scales is to provide a range of responses that respondents choose from to indicate their attitude toward the object in the question—perhaps a management action, policy option, or project design. The strength of values and beliefs is often measured using similar response categories.

After we are satisfied with our individual questions or groups of questions, we must consider how to order them on the survey, whether self-administered or not. Researchers often begin a survey with questions that are both interesting to the

respondent and are fairly easy to answer; this will motivate respondents to continue. Personal questions about income, education, or other personal characteristics are typically placed near the end of the survey. As a general rule, personal or sensitive questions should not be asked unless the information truly is needed. Questions on a similar topic are placed together and sequenced so the flow of questions is logical and reasonable rather than disjointed. Written or verbal transitions are provided between sections of the questionnaire to orient the respondent to what's happening next.

Questionnaire appearance is very important when the survey is self-administered. The survey form should be well laid out, not cluttered or difficult to read or follow. A longer, clean, attractive questionnaire is better than a shorter one where the questions are crammed together and inadequate space is provided for partially closed-ended or open-ended questions.

The appearance and functionality of the entire mailout or other package is similarly important for self-administered surveys. It is standard, for example, to provide postage-paid return envelopes to ease the chore for respondents, and to use a system of mailouts with repeated contact, perhaps coupled with phone calls, to reduce nonresponse. Similarly, telephone surveyors make repeated attempts to contact targeted households or individuals, calling at different times of the day, and arrange to talk to respondents at their convenience. Distinguishing the research effort from marketing attempts is a common goal for both mail and phone surveys. Incentives are sometimes provided in an attempt to increase response rates, but can also undermine any intrinsic motivation people might have to complete and return the survey. Check to see if a standard has developed in your area, or with your populations of interest, regarding incentives.

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**Implementing VBA research requires consideration of a number of legal, ethical, logistical, and scientific issues.**

## **Implementing VBA Studies**

Regardless of whether the collection of VBA information is qualitative, quantitative, or both, implementing the research requires consideration of a number of legal, ethical, logistical, and scientific issues. These are addressed in the following sections, in sufficient detail to make the reader aware of them, if not an expert in how to deal with them. Perhaps the most important implementation consideration, how to make sure the VBA information is appropriately applied, will be addressed in the following section.



## OMB Approval of Information Collections

The Paperwork Reduction Act of 1995 (PRA) requires that federal agency information collections use effective and efficient survey and statistical methods appropriate to the purpose for which the information is being collected. The purpose of the PRA is to reduce the burden for individuals and small businesses who may be bombarded with many requests for information from the federal government. The act directs the Office of Management and Budget (OMB) to develop and oversee implementation of standards and guidelines regarding statistical collection procedures and methods. Under the act, any collection of the same information from 10 or more individuals or entities (such as businesses) requires approval from OMB before the collection can proceed. Although this requirement is often viewed as specific to surveys, one can easily see how it could apply to interviews and focus groups if more than 10 people will be involved.

The PRA applies to federally sponsored research, which includes not just research conducted by federal scientists, but research paid for by the federal government if the information collection is required, whether the actual collection is done by volunteers, university employees, or private contractors.

The document, *Questions and Answers When Designing Surveys for Information Collections* cited earlier in this technical guide and available online, is the most current and clearest description of the act and its requirements as of the publication of this guide. It contains a description of the requirements and how to apply for clearance, but also serves as a primer of social research that will encompass most of the studies of VBAs relevant to the Forest Service. It contains sections on choice of methodology, sampling, modes of data collection, questionnaire design and development, statistical standards, informing participants about their participation and the confidentiality of their data, response rates and incentives, analysis and reporting, and issues specific to studies using stated preference methods (which can be used by economists to measure the economic values of nonmarket resources). In short, the document is a one-stop shop for information on social research—from the agency that regulates it.

As a practical matter, the PRA means that nearly all federally sponsored VBA studies must receive OMB approval, which can take from 6 to 12 months or occasionally more. Qualitative research may fall into a grey area because of its basic characteristics such as not presenting the same set of questions to people; in some cases OMB approval may not be required. Because part of the approval process is

approval of the statistical techniques used to ensure representation of the population, as well as that the required information does not already exist and approval of the questionnaire or at least the topics to be covered, most of the indepth survey methodology will have to be prepared up to 1 year before the information is collected—or even longer before the information is actually available for use. This timeframe must be incorporated into planning efforts. Unfortunately, it is not uncommon that the need for social information such as VBAs is realized well into a planning process, and perhaps even when a decision is about to be made, when it is obviously too late to collect it. Therefore, it is the responsibility of the agency official, planning team lead, or social scientist to identify the need for new VBA information well before it is intended to be used.

Some firms or universities may collect information on their own with the expectation of being able to sell the results to a federal agency, but agencies are not allowed to coordinate or request such an effort in advance. Similarly, a contract that specifies a product but does not request or require a collection of information should not require OMB approval, but the contractor may choose to collect information on its own to provide the report or product.

### Ethics, Confidentiality, Anonymity, Informed Consent

Conducting any research on human populations has ethical implications. Participation is voluntary; regardless of administration method, people can choose not to participate. We may try to lightly persuade them by mailing them another survey form or asking them to reconsider, but if they prefer not to participate, that's their right and it must be respected. This is the case not only for participation in the survey, but for responding to certain questions. If a person says they prefer not to disclose their income, then we simply move on to the next question. Self-administered surveys typically are accompanied by a cover letter explaining the voluntary nature of responses. However, as we have said earlier, we are aware some people might be inclined not to respond, so we design our entire effort to facilitate their response and encourage their participation.

We also mentioned that it's a good idea not to ask sensitive questions unless the answers are an important component of the analysis for a specific reason—not just because it would be good information to have in case we need it. Forest VBA studies will probably not be overly personal or sensitive by nature, compared to surveys of topics such as personal drug use or beliefs about premarital sex.

However, for people to answer openly and honestly, we typically promise that their responses will be confidential or, alternatively, that the participants will be anonymous. Confidentiality means that the researcher knows whose responses are whose, but will not divulge that information or analyze it in such a way that individual responses can be associated with a person. Anonymity means that the researcher does not even know who completed what response—obviously not possible in face-to-face interview situations.

The importance of this obligation to research participants cannot be overstated. Researchers depend on their ability to keep promises of confidentiality or anonymity. Interviewees would not provide the same level of information or detail, and would not be as open to revealing sensitive information if they knew their individual responses would be made public. The issues are similar to those faced by journalists, who often must promise informants that their identity will not be revealed in return for providing information.

The raw data collected during interviews, focus groups, and other qualitative techniques—such as field notes and recordings—should be stored separately from the project planning file, to protect the privacy of the people from whom the information was collected. Data coding sheets that identify individuals may fall into this category as well. In some cases, participants may allow or even request that their comments or identities be made part of the public record, but in most cases this information should be kept in access-controlled staff files, or in the possession of the primary investigator. Consultants and other researchers may have a real problem with any contract requiring them to provide the agency with raw data (such as field notes or transcripts of interviews) obtained when assurances of confidentiality were made to the interviewee.

Research involving human subjects conducted through universities must usually obtain a clearance or a waiver from an institutional review board, committee on human subjects, or similar entity. The purpose is to make sure that the rights of human subjects are not violated. Surveys of nonintrusive VBAs of the sort contemplated in this guide usually receive a waiver or exemption so they do not have to go through a full review process. Review boards may require a signed informed consent statement from participants in some studies, but surveys are usually exempt from this requirement. Nonetheless, respondents should always be informed about the study's policy on confidentiality, that participation is voluntary, why the research is being conducted, and how the results will be used.

The primary investigator may be an academic institution or a private contractor. These institutions or individuals may hold the information, but it may have to be made available should legal proceedings require. Although it is very unlikely to happen, a court may order that raw data be produced if it is pertinent to a case under their jurisdiction. In those cases, the Forest Service, or even a contractor, would be required to submit copies of the requested materials. It may be possible to declassify the data by removing names and other identifying information that would connect the data with the provider, but this solution is often impractical. Many researchers will destroy their field notes once a report is written, so the information is simply no longer available. In fact, some institutional review boards require this practice.

Other protocols may exist, such as when working with indigenous populations or certain political structures; experienced researchers are aware of these protocols and know how to properly comply with them. For example, when doing research in rural Alaska villages, it is necessary to seek approval from the Tribal Council, which typically requires appearing before the council in advance of the research.

Payment of interviewees or focus group members is not considered unethical and may be appropriate in some cases. For example, there may be an existing standard in a community or planning setting that should be followed. At least some token of appreciation should be considered; for example, focus groups are usually provided with refreshments and frequently with a small payment or reimbursement for travel expenses if they need to drive more than a few miles to attend the meeting. At a minimum, interviewees should be promised a copy of the study results.

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**The quality of information affects line officers' ability to analyze a situation, make good decisions, and document rationales.**

### Information Quality

The quality of any information, no matter the resource area, affects line officers' ability to analyze a situation, make good decisions, and document rationales. This has always been true, but the 2001 Data Quality Act requires quality information. The Forest Service must adhere to the quality of information (QOI) guidelines issued by the U.S. Department of Agriculture ([http://www.ocio.usda.gov/qi\\_guide/](http://www.ocio.usda.gov/qi_guide/)). Readers should refer to the QOI procedures specific to the Forest Service (<http://www.fs.fed.us/qoi/info-requirements.shtml>). These requirements pertain to reproducibility and repeatability of data. These general information quality guidelines apply to all types of information disseminated by USDA agencies and offices including reports on public VBAs. Information gathered for VBA projects must meet these standards of transparency and reliability even though the data may be from secondary sources.

Even a well-designed survey and method of administration can fail if not calibrated to the population of interest to test your assumptions about its clarity and understandability by the target audience. Testing is not a luxury but a necessity that should be incorporated into any survey or other quantitative study. Testing the instrument with at least a small number of people from the target population is also desirable for qualitative studies, but is even more important to warrant the use of closed-ended questions on a survey.

Tests can be conducted a variety of ways. One option is to hold one or more focus groups where people complete the survey and then discuss both their answers and the process of completing the survey. This gives direct feedback to the researcher, who can then revise the questionnaire, planned analyses, or the method of administration. The survey can also be tested in person for a reasonable number of individuals, or can be mailed or delivered by telephone if that will be the survey methodology.

## Validity and Reliability

Regardless of whether we are measuring attitudes, beliefs, or values, and how we are measuring them, reliability and validity are critical considerations. By valid, we mean that the scale or question actually measures what we think it does (instead of measuring something else); by reliable, we mean that our scale measures it consistently across time and people.

In general, a measure is valid if it measures what it is supposed to, instead of something else. How do we know if we're measuring what we think we are? One simple way is to carefully assess whether it makes sense to measure the concept using the procedure—if the answer is “yes,” then the measure is said to have face validity. Obviously we cannot rely on this method alone, because it is fairly subjective.

Content validity is another way of determining if survey items are representative of the topic being measured. We clearly define what we are interested in measuring, then judge whether the items adequately represent the topic.

Another way to assess validity is to see how well the resulting measurement correlates with other measures of the concept, such as behavioral evidence, or correlates with other standard ways of measuring that attitude, belief, or value. This is called construct validity; think of it as triangulating—we are more confident that we're describing a phenomenon if we measure it several different ways and reach the same finding. Another type of validity is called predictive validity; is the measure useful because it means something—does it have any predictive value?

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**Reliability and validity are critical considerations.**

This is also called criterion-related validity: we are using the measure because presumably it is related to some criterion in which we are interested. Finally, validity does not exist by itself but is related to the intended use of the data; a measure that is valid for one purpose may not be valid for another.

Reliability is the degree to which a measure will produce the same results with repeated measurements. A ruler is a reliable instrument because you could measure something with it, and get the same results each time you measured it. But what about the reliability of survey questions? Like validity, there are several aspects of reliability and several ways to test a survey's reliability. One way is called test-retest reliability. If we have a valid measure of intelligence (IQ), for example, we should be able to administer it to an adult one week, and obtain the same score if we administer it a month later. There could be slight variations, but if we find that someone's intelligence has doubled within a month, then the reliability of our instrument (the IQ test) would be questioned (as would its validity).

Another way to measure the reliability of the IQ test would be to split it in half and see whether someone scored roughly the same on each half of the test. Another type of reliability is referred to as internal consistency; we can measure the reliability of a set of items on a scale by calculating the average correlation among all the items and factoring in the number of items. For additional information on reliability and validity, consult Litwin (1995), Carmines and Zeller (1979) or one of the textbooks in psychology and related social sciences.

## Records, Data Storage, and Reports

The project files for NEPA projects and administrative record for forest planning both document the rationale by which decisions are made. Information collected to better understand public VBAs is part of that rationale. As such, copies of reports resulting from the research should be kept in the project planning record. In most cases, this information should be available in both electronic and paper versions. The reports should include enough information about the methods used that an external reviewer could assess the appropriateness of the application to the purposes for which it was intended. When possible (given the privacy concerns outlined above) the data should be stored in the Natural Resource Information System Human Dimensions (NRIS HD) data warehouse. Copies of all reports produced should be submitted to the NRIS HD warehouse and linked to the HD eLibrary ([http://fsweb.nris.fs.fed.us/products/Human\\_Dimensions/elibrary/index.shtml](http://fsweb.nris.fs.fed.us/products/Human_Dimensions/elibrary/index.shtml)).

## Dissemination of Results

In addition to being applied in NEPA documents—hopefully including mention in a record of decision, VBA information can be published so it is available to the research community. Often new insights can be gained by comparing the VBAs of one population to those of another, perhaps in a different region, or for another stakeholder group. Forest Service general technical reports are a common repository for VBA studies, along with a variety of social science journals.

Another common practice is to share the results of the VBA study with members of the population or at least the sample. Surveys, for example, ask people if they would like to receive a copy of the results, and offer a mechanism for providing one. Sometimes researchers will hold focus groups to help them interpret the results of quantitative studies or to help develop surveys. Press releases can be prepared for local or regional media that describe the results of the VBA study and how they were used by the agency. In other words, there is a responsibility to share your VBA findings not just in NEPA or other decision documents, but in broader ways so other members of the public have the chance to see the results. Public affairs officers are usually delighted to find out that VBA information exists (although they should already be aware of the effort) and will search for ways to help you disseminate your results to appropriate audiences.

## The Use of Outside Assistance to Conduct VBA Studies

In most cases, collection of new VBA information (and sometimes analysis of existing information) will not be done in-house. A variety of mechanisms exist for having the VBA collection work done by an outside individual or group. It is not the intent here to go into detail about the different kinds and the advantages and disadvantages of each, but to provide a starting point. If you will be dealing with contracts or agreements, you should work closely with a contracting officer, agreements specialist, or purchasing agent. Consider taking the training to become certified as a contracting officer's representative. Contracts, agreements, and purchases are legally binding instruments carrying responsibilities and consequences. It is helpful to know the details especially when dealing with what is likely a new area of contracting (VBA studies). Your situation will determine what mechanism you will be able to use. A partial list includes:

- Procurements
- Competitive contracts
- Sole-source contracts

- Indefinite delivery indefinite quantity (IDIQ) contracts
- Cooperative agreements
- Challenge cost-share agreements
- Participating agreements
- Interagency agreements
- Volunteers
- Forest Service enterprise teams

Sometimes your issues and data needs are aligned with the interests of researchers—within either Forest Service research stations or universities. In this case, opportunities may exist to work with scientists through a cooperative agreement or a challenge cost-share agreement. In considering working with universities, you should recognize that your timeframe might be different from that of the scientist and graduate students. The cooperative ecosystem study units (CESUs) located within your region may be especially qualified to conduct VBA studies, and working through them is usually easier than going through a full contracting process.

Virtually all social and economic analyses can be conducted by contractors. This includes VBA data collection and analysis and related efforts such as project management, information syntheses, report production, and public involvement. You should consider a number of different factors in selecting a contractor. If you advertise a project through a request for proposal, you may have several very qualified potential contractors from which to choose. Quality and price are two major considerations, but not the only ones. Other factors to consider may include potential contractors' past performance, availability of specialized skills or equipment, or special connections to a geographical location or region. Remember that you will need to be able to track and document how you reached the decision about choosing a particular provider.

A statement of work (SOW) will be needed for a VBA data collection project. A SOW identifies the scope of the project, the type of information needed, the tasks that need to be accomplished, and the division of labor for tasks. If your SOW is not well thought out and detailed, you will not get what you need. The SOW can take a lot of work and time to develop. Even after a contract or agreement is signed, the work for the Forest Service employees involved does not end; some degree of Forest Service oversight and involvement is required. Strongly consider placing one or more social scientists on the team evaluating proposals and negotiating with contractors. Deciding what to put in a statement of work for a



VBA study can be a difficult task, but becomes easier if you have an example to follow (see Stewart and Mielke (2002) or consult with your regional social scientist).

## **Applying VBA Information to Land Management Planning**

The preceding sections described the importance of having VBA information available and provided direction in collecting it, whether accomplished through secondary or primary analyses, whether qualitative or quantitative in nature. However, the presence of relevant VBA information does not mean that it will be used, or available in a form that is conducive to applying to a decision. Forest Service decisionmakers are not accustomed to having systematic information on public or other stakeholder values, beliefs, and attitudes specific to a type of decision. Even if they value VBA information, they may struggle with how to apply it.

Continued dialogue between VBA researchers and managers is the key, and is greatly facilitated by a framework or protocol that structures that dialogue and makes sure that it happens in a systematic way. If such a framework does not already exist for the decision at hand, consider developing one. At a minimum, the decisionmaker, other interdisciplinary team members, and planning leaders or coordinators should know that the VBA information is being collected and be aware of its possible uses.

### **Use of VBAs Throughout the Planning/Management Cycle**

Values, beliefs, and attitudes have a role not only in larger scale products such as social assessments and social impact assessments, but in every phase of the adaptive management process. There's never a bad time to collect VBA information. That said, when the VBA information is collected, and for what purpose, will influence the collection of information. If the desire is to collect public VBAs to lay the groundwork for scoping of a plan revision, for example, specific issues or management alternatives will not yet have been identified, so the agency could not get feedback on the specifics. If management alternatives are available, then it would be reasonable to measure attitudes toward those alternatives, beliefs about their effects on resources and opportunities that people care about, and the values associated with public lands and opportunities. If major planning decisions have

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**The presence of relevant VBA information does not mean that it will be used, or available in a form that is conducive to applying to a decision.**

already been made, a VBA study could focus on attitudes toward implementation, preferences about the timing or characteristics of specific projects, or beliefs about what should be monitored because it could be affected by plan implementation.

It is usually fallacious to wait for a “better” time to collect VBA information—that is simply a reason for not collecting it at all. Instead, think about upcoming decisions and how having VBAs available from the public or stakeholder groups could be beneficial. The VBAs will not only be applicable to the decision at hand, but will lay the groundwork for further VBA studies and associated social research, as well as let your stakeholders know that you care about and will apply information about their values, beliefs, and attitudes regarding the agency, its management activities, and the meaning of changes in opportunities on public lands.

Public VBAs can be considered in the development of all components of a forest plan, including desired conditions, objectives, suitability of areas, and special areas and guidelines. The VBAs can be applied to description of the existing social environment, statement of desired conditions, identification and selection of management alternatives, and identification of the impacts of alternatives. They can point to key indicators that people believe should be monitored and to adaptive management. Social and economic indicators are part of the monitoring indicators necessary to evaluate progress toward achieving desired conditions.

## Applying VBA Information to Forest Service Decisions

This section provides three case studies of how VBA information was applied to Forest Service decisions. The first two examples are drawn from revision of the Chugach Forest Plan in the 1990s. The third example, taken from a decision on oil and gas leasing on the Rocky Mountain Front, shows how information on VBAs made available through public involvement rather than through a separate study led to a controversial decision, but one that has been sustainable—and expanded—over time.

### **Case study 1: quality of life—**

As an indepth example, let us see how the Chugach National Forest collected and applied VBA information to develop its Revised Land and Resource Management Plan and Final Environmental Impact Statement (FEIS) (USDA Forest Service 2002, 2003). The FEIS described the regional socioeconomic setting using available data; the comparisons of south-central Alaska to Alaska as a whole and to the United States on such variables and trends as population size and density, ethnicity, age,

income, employment, and economy (including economic sectors related to the Chugach) provided the reader with a basic understanding of the socioeconomic character of the study area.

This regional story was supplemented by description of similar conditions and trends at the community scale because communities associated with the Chugach differed widely. Portraying socioeconomic conditions at the regional scale only would eliminate this local uniqueness and the dimensions of individual communities, which may differ widely in their location and have diverging relationships to forest management.

Community and regional plans provided one source of information. However, forest planners and managers realized that the full socioeconomic story of forest-associated communities could not be told from existing information. Critical information about residents' attitudes toward management activities, beliefs about the Forest Service and the association between activities and outcomes, and values associated with places on the forest could not be captured using secondary data.

Therefore, in addition to using available secondary social and economic data, the Chugach collected new information from local residents. In early 1998, Alaska Pacific University (APU) conducted a social survey, "Planning for the Future of the Chugach National Forest" of residents in 12 communities neighboring the forest. The purpose was to measure (1) the attitudes of residents toward general forest uses and specific forest management/allocation issues, and (2) ecosystem values present in the forest.

Then APU followed up with another survey the next year, "Your Community's Quality of Life." The purpose was to measure residents' self-reported quality of life in their communities and how it is affected by public land management. The same 12 communities were sampled, again using the state's permanent fund dividend database as a sample frame. The survey contained questions on 30 preselected factors that have been related to quality of life, encompassing (1) resident feelings about the importance of and satisfaction with a number of social, economic, and environmental attributes of their community; (2) preferences for growth in various economic sectors; and (3) evaluations of the resiliency of their community. The emphasis was on factors over which the forest had the greatest influence, although the degree of influence differed among factors. In addition, community residents ranked the importance of and their satisfaction with 19 public land uses or opportunities.

One way the results were analyzed and presented in the FEIS/Forest Plan was to aggregate the results across all 12 communities—creating a regional scale of

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**A majority of respondents favored nonconsumptive, low-impact forest uses over consumptive, higher impact forest uses.**

analysis, with the important assumption that each community's responses should receive the same weight regardless of population size or other differences. Among 13 forest ecosystem values recognized as present in the forest, (1) recreation, (2) life support, (3) aesthetic, and (4) subsistence values were consistently rated higher by respondents in all communities. Cultural, historic, and spiritual values were consistently ranked lower by respondents in all communities. Among 19 forest uses, a majority of respondents in 11 of the 12 communities (except Seward) favored nonconsumptive, low-impact forest uses (for example, fish and wildlife habitat, camping and picnicking, and nonmotorized recreation) over consumptive, higher impact forest uses (for example, commercial mining, oil and gas, and logging), although no uses were substantially opposed.

The three most important public land factors related to quality of life were clean air and water, the beauty of the surrounding area, and open undeveloped areas. The three factors ranked lowest in importance were subsistence gathering, subsistence hunting and fishing, and sport hunting and fishing. The three quality-of-life factors respondents were most satisfied with were the beauty of the surrounding area, clean air and water, and open, undeveloped areas. The three factors ranked lowest in terms of satisfaction were the roads/transportation system, access to and use of public lands, and subsistence hunting and fishing.

The utility of obtaining measures of both residents' perceptions of the importance of a factor and how satisfied they were with that factor allowed researchers, managers, and the public to assess the relationship between importance and satisfaction. For example, the largest divergence between satisfaction and importance ratings for the factors were present for job/employment opportunities, the roads/transportation system, and clean air and water. It also allowed managers to measure perceptions of performance on residents' most important factors. This technique has been widely used in the VBA literature because it allows a matrix of the factors to be constructed (fig. 2).

The main purpose of the study was to develop one or more scales that would be useful to understand peoples' values, beliefs, and attitudes relevant to wildfire management. The results suggest that there are several important dimensions that underlie peoples' attitudes toward any possible fire management techniques. Scores on the first dimension, biocentric, reflected the extent to which people believe that nature, forests, and wildlife have as much of a right to exist as do people. The second, anthropocentric (often referred to as utilitarian), reflects the belief that the primary purpose of nature, forests, or wildlife is to be of use to people.

		Satisfaction	
		Low	High
Importance	Low	Performing poorly but little cause for concern	Performing well but could shift priorities
	High	Changes need to be made to improve satisfaction	Keep up the good work

Figure 2—Relation between importance and satisfaction.

The authors of the section of the EIS using the VBA data noted that most of these findings did differ by community, so for location-specific activities it would be important to look at the results for communities located near those proposed activities. For example, Whittier, Kenai, Anchorage, and Valdez appeared to be the most in favor of additional growth in their communities. Hope-Sunrise, Cooper Landing, Girdwood, and Moose Pass had the smallest percentage of respondents favoring additional growth

The EIS section “Environmental Consequences” used the VBA information to compare the alternatives in terms of how well they reflected the preferences, interests, or desired outcomes of local residents. The VBAs provided planners with another criterion by which to judge the alternatives—the criterion of social acceptability, at least as measured by this set of variables. The “Social Effects” section of the FEIS contained a section on “Local Preferences,” with an introduction describing the results and their role in the impact assessment:

In this section, the alternatives are compared in terms of how well they reflect the preferences, interests, or desired outcomes of local citizens as expressed by their responses to the two community surveys discussed in the affected environment section. This approach is inherently subjective and carries with it the implicit assumptions that the survey respondents were a well informed and representative random sample of the local public, who understood the questions, asked and responded in a truthful manner. Despite these caveats, the sample results provide a better metric of the interests of the general local public than is usually available in the Forest Plan revision process.

The next case study also involves the Chugach Forest Plan revision, but with a different focus and method of VBA data collection.

**Case study 2: values suitability analysis—**

The Chugach planning process used another form of values information, which was collected by asking a sample of residents of local communities to locate on a map of the forest the places they associated with a set of values—the set of values described earlier (Reed and Brown 2003). This technique, which has been applied in a number of studies, provides a spatial display of how people’s values are arrayed across the landscape. The relevance of the values mapping study for this section is how it was applied in development and analysis of forest plan alternatives, which is called a values suitability analysis (VSA):

...VSA combines the features of expanded public participation with a rational, analytic framework for incorporating human values into forest plan decision making. The VSA methodology provides a means to evaluate and compare how "logically consistent" potential management prescriptions (set of activities) are with publicly held forest values. Based on a spatial inventory of ecosystem values, the VSA methodology constructs a numerical rating, or set of ratings, for each management prescription and ecosystem value interaction. These ratings are used to determine (1) which management prescription is most compatible with the dominant ecosystem value within a given management area, as well as (2) the marginal difference in overall compatibility between alternative management prescriptions. The VSA methodology can be used to generate forest plan alternatives or serve as a benchmark to evaluate different forest plan alternatives.

Planners first mapped the values by Chugach management area (fig. 3). This is just one fairly simple way of portraying values, for which all respondents’ values were included. Other maps showed the differences in value locations based on respondents’ community of residence, or depicted the diversity of values attached to a single management area.

After the planning team identified potential management prescriptions and assigned them to each management area, they were able to rank each management prescription in terms of its compatibility with the area’s values using a scoring system developed previously. Figure 4 shows one example of the type of analysis conducted—how the compatibility score of the forest products emphasis management prescription varied across the forest because of the quantity and mix of ecosystem values in each forest management area. The authors commented, "It can

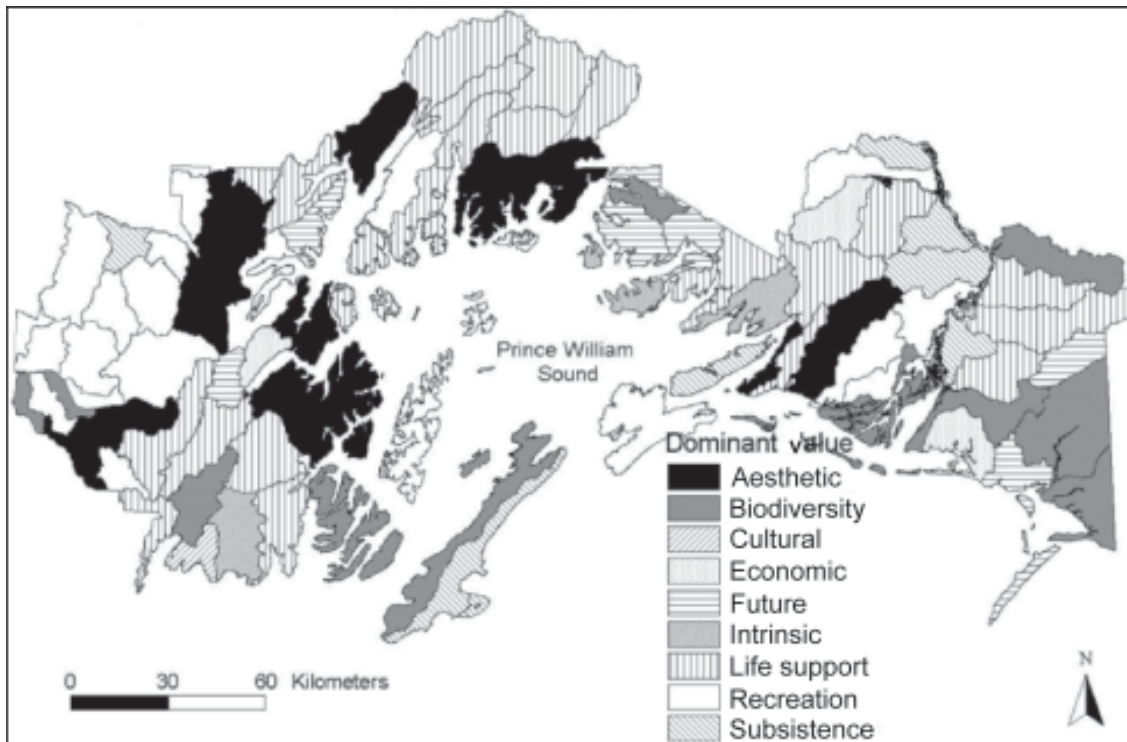


Figure 3—Dominant values by management area in Chugach National Forest (Reed and Brown 2003).

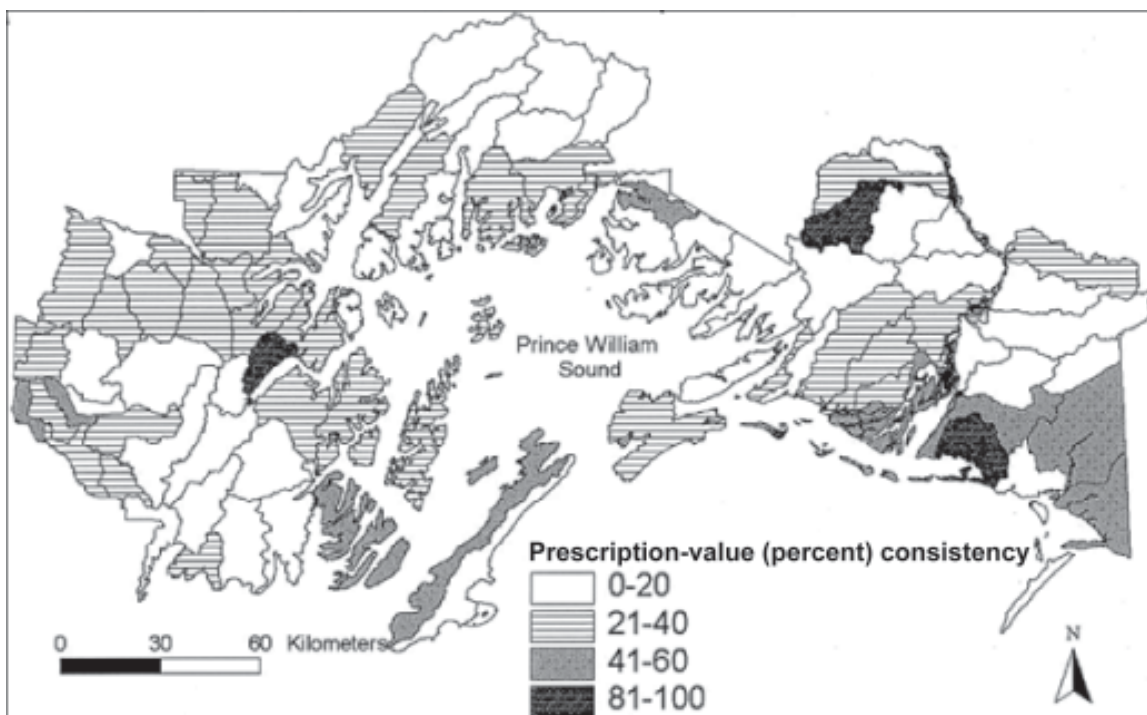


Figure 4—One management prescription (forest products emphasis) and consistency with forest values.

also be observed that the forest products prescription is generally not compatible with public forest values in the Chugach except in several isolated watersheds.” The planners then took the process one step farther, analyzing compatibility between values and entire management alternatives.

Reed and Brown (2003) noted that adoption of VSA may be hampered by lack of trust and other institutional issues: “...the VSA methodology was generally considered too experimental to earn the trust of the entire planning team as a support to decision making, although several stakeholders literally demanded that it be more fully integrated.” Nonetheless, they felt that VSA and other techniques for explicitly measuring human values and using them to develop and evaluate management options holds promise for land managers:

We advocate its development and use as a decision support tool, with the potential to produce information adding an expanded dimension to planning—one which is equal to that accorded traditional biophysical data. The first practical experience with actual application of VSA in the Chugach forest plan revision suggests that it can be a powerful analytic tool that both stakeholders and planning staffs can utilize for mutual benefit.

The VSA illustrates how information on human values can be explicitly incorporated into a forest planning process. The key is having a framework, developed in advance of the data collection, for use of the VBA information.

### **Case study 3: sense of place—**

This is perhaps the most famous instance of a VBA concept such as “sense of place” being cited as a primary reason for a major decision on a national forest—a 1997 decision regarding oil and gas leasing on the Lewis and Clark National Forest in Montana. Forest Supervisor Gloria Flora chose the no-action alternative, under which hundreds of thousands of acres of land along the Rocky Mountain Front were put off limits to new oil and gas leasing for the next two decades (Flora 2003). Selection of the no-action alternative was surprising because the decision at hand had been cast as which lands would be made available for leasing and what stipulations would be necessary to protect surface resources and existing uses.

The preferred alternative in the draft EIS had involved a modest amount of development—opening up leasing on 7 percent of the Front and not allowing surface occupancy. However, after reviewing the alternatives, new information, and the public comments, later, Flora (2003) said,



I finally decided that leasing—in the only manner that protected the significant values of the RMF—didn't benefit anyone. The evidence was clear that the RMF was ecologically unique and irreplaceable. People were strongly bonded to the landscape and there were no equivalent substitutes for experiences they found on the RMF...I knew that such a choice may bring about unintended political consequences and could be detrimental to my career and me personally. However, it seemed a worthy risk to take in return for the overwhelming benefits to a great number of people now and in the future, not to mention the protection of such a stunning landscape... Finally on 9/27/97, I held a press conference and announced the decision. I based the decision on people's sense of place—their connection to the landscape—and the outstanding ecological values.

In this instance it was public comment, not social research, that documented the value, but it illustrates that public VBAs can play important roles in Forest Service decisions. When measured systematically using scientific methods, sense of place and similar values can enter the decision process not as public comments, but as science comparable to any other type of science findings used to help develop, assess, and implement projects and plans.

Such decisions based on sense of place and associated human values can have far-reaching effects beyond a given national forest. In December 2006, President Bush signed a bill banning all new oil and gas drilling on the Rocky Mountain Front. The same bill, based on the provision inserted by Montana Senator Max Baucus, also provided tax benefits to energy companies selling their existing leases on the Front to conservation groups. As of April 2007, several energy companies had sold or donated their leases for conservation purposes.

## **Conclusions**

Values, beliefs, attitudes, and related concepts have a critical role in natural resource and public land management. They are the lenses through which the public and stakeholders view the forest management world. It is helpful to understand public attitudes toward the agency and management practices and outcomes, but even more important to understand the values people hold regarding public lands, and their beliefs about the effects of various management actions. Without knowing the values, beliefs, social norms, and experiences that combine to form a certain attitude, we are helpless to be responsive to public demands, or to explain the effects of alternatives on resources and opportunities people care about. Thus a

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**When measured systematically using scientific methods, sense of place and similar values can enter the decision process as science comparable to any other type of science findings.**

focus on attitudes alone is misplaced; it is how they fit into a broader behavioral system that is meaningful and gives us something to work with, whether the goal is to design an effective educational program or to craft a preferred alternative that is, other things being equal, socially acceptable.

This guide is not a step-by-step cookbook for collecting and using VBA information; in this case one size would definitely not fit all. Instead, we have tried to define VBAs and the principal ways they can be measured and used, employing examples and case studies that we hope are inspirational. Any planner or decisionmaker who has had the luxury of having relevant, timely information available about public values, beliefs, and attitudes understands the many potential benefits. We hope that the VBA technical guide helps to create more such benefits, to the agency, the stakeholders, and the resources and opportunities we manage.

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## Appendix: Example of Interview Guideline for Qualitative Research

### Topic Areas for Discussion (Russell and Adams-Russell 2006b)

The following topic areas will guide the discussion about forest and grasslands management.

**Identity.** Each participant will be asked to describe their interest in management of national forests and grasslands and any particular perspective or interest/stakeholder group with which they are affiliated.

**Community Character and Recent Changes.** This topic addresses the lifestyles and social life in communities adjacent to national forests and grasslands. The purpose of this discussion topic is to understand the connections between communities and these public lands. Example questions are:

How would you describe this place to someone who has never been here, both the place and the way of life?

How has this community changed in the last 10 to 15 years? What are the important sources of change?

What are your thoughts about the challenges for this community/region?

What communities, occupations, or lifestyles are most and least affected by how national forest and grasslands are managed?

**Uses.** Communities and groups have connections to national forests and grasslands from the types of uses of these lands. This topic develops the range of uses of national forests and grasslands. Example questions to discuss are:

What are the most and least common uses of these national forest and grasslands?

Are there any types of existing or potential uses that are not compatible with these lands?

Do all users get along?

Is there anything the Forest Service should do to change how forests and grasslands are used in the future?

**Resources.** This topic area identifies the types of resources that are contained within national forests and grasslands. This will aid in identifying the connections between communities and resources of the national forests and grasslands. An example issue to develop is:

A place is often thought of as the sum of its parts. Can you describe the parts, the types of resources of this national forest or grassland?

What are the special qualities and characteristics of these grasslands?

**Areas for Special Designations.** Some forests and grasslands have an area or geographic feature that is given a special designation such as wilderness, wild and scenic river, roadless area, or research natural area.

For any existing area, how do you describe the qualities and characteristics of this area?

What does it contribute to communities in this area?

What are the benefits of having this type of area in this national forest or grassland? (Local, national, other?)

If areas for special designation do not exist on this national forest or grassland, is there a need to identify a particular place or landscape? If so, where?

Are there other types of “special places” in this national forest or grassland? (Locate these on forest/grasslands map). And, what are the qualities of these places that make them “special?”

**National Forest and Grassland Benefits and Values.** “Value” has several definitions such as “attributed worth or merit.” This discussion will develop locally meaningful definitions about values and identify specific values about national forests and grasslands.

Similarly, a “benefit” can refer to the types of effects that result from a resource such as a national forest or grassland. Some benefits may be economic and others may be recreational. Some communities, groups, or individuals may receive more benefits than others from having such resources nearby. This topic area will address questions such as:

What is valued about national forests and grasslands?” (for example, products, services, opportunities, existence)

What are the benefits to nearby communities and groups from national forests and grasslands?”

**Desired Futures.** Many people have an idea of how they would like to see a place such as a national forest be in the future. They have ideas about current conditions and how those should change to improve the landscape and its resources. This topic will develop information about your future vision for national forest and grassland resources. Example questions this topic will address are:

How would you describe how these lands (national forests/grasslands) were when you first became aware of them? (Historical and present-day conditions)

If you think about how you want these forests/grasslands to be when your children are grown, what is your vision?

What should the Forest Service do to achieve your future vision for these lands?

**Key Management Issues and Priorities for Future Forest Management.** The Forest Service is developing strategic plans to guide future management of national forests and grasslands. An understanding of public assessments of existing plans and future needs can help the agency to identify planning issues. To discuss this topic, we can address questions such as:

What do you think is broken and what needs to be fixed as the USFS revises existing plans?

What has the USFS done well in its management of lands and resources here? Are any changes needed in the management strategy in those areas?

What are the “bottom line” issues for you in revision of the existing plan? That is, are there management issues that absolutely must be addressed or changed from how they are now?

**Additional Issues.** These topics are guiding the discussion, but there may be others that you feel are important and need to be included. Please identify any additional topics you feel need to be considered by the USFS as it tries to understand the connections between communities and national forests and grasslands.

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