The background image shows a large-scale forest fire with tall, intense flames reaching into a hazy sky. In the foreground, several firefighters in yellow protective gear and helmets are positioned on a dirt road, some looking towards the fire. On the right side, a wooden building with a green metal roof is partially destroyed, with its structure exposed and charred. The overall scene is one of a major wildfire event.

**Monitoring trust as an evaluation of the success of collaborative planning in  
a landscape-level fuel hazard reduction treatment project in the Bitterroot Valley,  
Montana**

Final Report  
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## Table of Contents

<b>Table of Contents</b> .....	i
<i>Table of Figures</i> .....	ii
<i>Table of Text Boxes</i> .....	ii
Introduction.....	1
Background.....	2
<i>Why do we care about Trust?</i> .....	2
<i>Necessity of civil society, cooperation, interdependence</i> .....	5
<i>Towards a productive and economically healthy society</i> .....	5
<i>Social capital</i> .....	6
<i>The role of trust in enduring social relationships, social connections, and social capital</i> .....	8
<i>Distrust</i> .....	9
<i>Trust and Government</i> .....	11
Definitions of Trust.....	13
<i>Shared norms and values</i> .....	14
<i>Contingent Consent</i> .....	16
<i>Perceived Knowability</i> .....	17
<i>Summary</i> .....	18
Project Justification.....	20
Measurement of Trust.....	22
<i>Trust Measures</i> .....	23
Data Collection.....	28
<i>Methodology</i> .....	28
<i>Sampling in the Bitterroot</i> .....	29
Results.....	31
<i>Overall Sample characteristics (weighted)</i> .....	31
<i>Sociodemographics</i> .....	31
<i>Regional Background</i> .....	33
<i>Further Statistical Analyses</i> .....	40
<i>Factor Analysis</i> .....	40
<i>Cluster Analysis</i> .....	43
<i>Analysis By Trust Cluster</i> .....	45
<i>Summary of characteristics of trust clusters</i> .....	53
Discussion.....	56
<i>Comparison with known data</i> .....	56
<i>Segmentation</i> .....	56
<i>Implications for Public Involvement</i> .....	58
Works Cited.....	61
Appendix A: Survey Instrument.....	64
Appendix B: Survey Results and Analysis.....	80
Appendix C: Trust Group Crosstabulation.....	123

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*Table of Tables*

Table 1: Regional Characteristics, Sample Sizes, and Sample Weighting .....30  
Table 2 Respondent age, number of years in Ravalli County, and number of years in Montana. ....31  
Table 3: Respondent place of residence, gender, education, and income .....32  
Table 4: Residence Location .....33  
Table 5: Respondent involvement in forest issues .....34  
Table 6a-b: Respondent's personal and economic experience with fire in the Bitterroot .....35  
Table 7a-b: Respondent attitudes towards Bitterroot National Forest general management .....37  
Table 8: Respondent's shared norms and values with the US Forest Service.....39  
Table 9: Respondents' general cynicism .....40  
Table 10: Cluster center location for trust factor scores.....44  
Table 11: Demographic and geographic characteristics of trust clusters .....45  
Table 12: Geographic and other characteristics of trust level clusters.....46  
Table 13: Trust level groups' experience with the social and economic effects of forest fires.....47  
Table 14: Trust Level Grouping Based on General Cynicism of Respondents.....48  
Table 15: Trust level groups' of opinions of BNF general management .....49  
Table 16a-e: SVS USFS Trust Questions.....50  
Table 17a-b: Attitudes towards the Federal Government .....52

*Table of Figures*

Figure 1: Hypothesized causal diagram of trust .....19  
Figure 2: Trust Dimension Factor Scores.....44  
Figure 3a-c USFS Additive Trust Measure, Group Histograms.....51

*Table of Text Boxes*

Box 1: Bases of support for shared norms and values .....16  
Box 2: Bases of support for contingent consent .....17  
Box 3: Bases of support for perceived knowability .....18  
Box 4a-c: Survey Items for Trust Dimensions .....24  
Box 5a-b: Survey Itmes for Government management, and trustworthiness of others .....26





# Introduction

Following the severe forest fires in Western Montana in 2000, the Bitterroot National Forest commissioned a social survey to help gain a representative understanding of how residents of Ravalli County, Montana viewed the Bitterroot National Forest, and how they would prefer that the forest were managed (Bureau of Business and Economic Research [BBER], 2001). One proposition that arose from responses to the survey was that some Bitterroot residents had a lack of trust of the US Forest Service. It was not clear how pervasive this lack of trust was, and it was unclear if it was limited in scope to agency management of fire, or rather, ranged in the broadest degree, from a general lack of trust in the US Forest Service to a lack of trust in specific Bitterroot National Forest management actions, including fire response.

In order to gain insight into the causes and consequences of this lack of trust, as well as to gain a more thorough understanding of the extent of Ravalli County residents' trust in the Bitterroot National Forest, the current study was initiated. The first section of this report explores recent scientific literature on trust, discussing why trust is important, its role in a productive society, its role in enduring social relationships, the idea of *dis-trust*, and the role that trust plays in relationships with government organizations. Definitions of trust are summarized, and a theory of its dimensionality and complexity is presented. The next section looks at how trust can be studied, and discusses different measures that have been used in previous research. The next section of this report outlines the methodology used in this study, followed by the results section, which outlines the preliminary findings of the statistical analyses. Finally, the discussion section outlines the implications of the findings, and calls for

potential management actions related to building or maintaining trust in fire and fuels management.

## Background

### *Why do we care about Trust?*

Looking back over history, one of the most important socio-political concepts has been trust. Trust has the potential to permeate nearly every aspect of culture. By gaining an understanding of trust, one gains insight into the interrelationships and dependencies that make our social systems function. Having this understanding, cultures and communities have the potential to improve themselves and become more effective democracies at all aspects of socio-political endeavors.

Across this nation, communities have experienced significant declines in *social capital* over the course of recent decades; we seem less civically engaged, less socially active, and despite the fact we are more tolerant than previous generations, trust each other less (Putnam, 2000). Informal personal interactions have gradually been replaced with highly structured, formal interactions with others. Meaningful discourse is disappearing, with shallower relationships becoming the norm. The structure and regulation required in most relationships introduces the inefficiencies of contracts and law to keep parties honest. Relationships however, which are built upon mutual understanding, honesty, and trust, work more fluidly and provide a necessary lubrication for the social frictions of everyday life (Putnam, 2000). The most pervasive of these building blocks is trust, with direct implications on the economic well-being of a nation & its ability to compete (Fukuyama, 1995).

Trust itself is difficult to define, and scholars have come to little consensus on what the term precisely means. There is even less agreement on how to identify when trust exists, and how to measure it (Levi, 2000). To some extent, trust is the *process by which one accepts assignment of the responsibility to work on certain tasks to other persons, groups, agencies, or institutions* (Earle and Cvetkovich, 1995). A strong argument exists, though not uncontested, that we extend trust to others out of self-interest, and that by *trusting one another, all parties involved will mutually benefit* (Hardin, 1993). People and organizations tend to react directly and in kind to the amount of trust directed at them (Carnevale, 1995). Thus, by trusting someone, they are more likely to trust you, and by not trusting someone, they are likely to be equally cautious.

Many have argued that the United States is currently experiencing a period of widespread political malaise and disengagement – levels of social capital and trust are astonishingly low (Putnam, 2000). One only has to look as far as Dale Bosworth, the Chief of the US Forest Service, and his response to comments about the yet-to-be enacted 2003 Healthy Forests Initiative. Bosworth claimed that the initiative was an “opportunity to build trust,” and that “maybe this legislation will give us a chance to show that [the Forest Service is] a professional organization – that we do care about the land” (Devlin, 2003). Examples such as this have become increasingly common, and may indicate that normal means of conflict management within the political system are not functioning properly (Miller, 1974a). A widespread lack of trust hinders relationships of all types.

When abundant, trust can exist in organizational groups ranging in size from the smallest family to the largest nation, and has the potential to fill every void in between. Strong relationships tend to be rooted in trust, which can spontaneously form within social groups,

creating both social capital and normative reciprocity. The manner in which social associations form within groups depends upon the degree to which they exist within communities of shared norms and values, as well as the extent to which they can subordinate their individual interests to those of the larger group. By deciding that cooperation is in their long-term best-interest, organizational members voluntarily enter into contracts of participation, be they expressed or implied, and in doing so, reduce the need for external intervention (Fukuyama, 1995).

Trust is thought to play three key roles in interactions between people and organizations (Carnevale, 1995). For one, trust is *essential*; it holds the global social fabric together. Trust cannot be substituted with fear or authoritarianism, but rather must be based on mutual faith. Without faith that the outcome of a transaction will be equitable, only the foolish will participate. Second, trust is thought to play the role of *truth*. When mutually trusting, parties are able to more accurately and honestly assess the extent of their relationships. In low trust organizations, more tends to be hidden than is revealed. But, in high trust organizations, all the variables are out on the table and everyone can work from the same page. Individual organizations with trust-based relationships tend to be better performing and more reality-centered than those that rely on the inefficiencies of force and intimidation. Third and finally, trust is thought to be requisite to social *survival*. By accepting the truth, people do not have reason to be defensive and can open themselves up to learning. In modern, working society, organizations and managers that are unable to make use of the experience, know-how, information, and intelligence of lower-ranked members are prone to failure. It is often forgotten that organizations are, in fact, learning systems and need to be managed in a fashion that liberates rather than restrains people's knowledge (Carnevale, 1995)

### *Necessity of civil society, cooperation, interdependence*

Putnam (2000) found that trust and community participation go hand in hand. Those who actively participate in their community are commonly more trusting and trustworthy than their comparably passive neighbors. He also found the converse to be true: those who trust others are more prone to community involvement. Regardless of one's opinion of which comes first, trust or civic engagement, there appears to be a definitive link between trusting and being involved in one's community. When we are involved in communities, we have more control over direction, and we build relationships with other active members, further strengthening and encouraging honest interactions.

Alternatively, in communities with low levels of civic engagement, the democratic system tends to be severely challenged. Because some of the democratic tenets are participation and majority rule; a democracy, therefore, cannot survive for long without the support of a plurality of its members. If communities believe they are not being fairly represented and become politically discouraged, there arises a greatly heightened potential for political and social change (Miller, 1974a). Governments may rely upon force to control public actions and sentiment, but societies that rely upon the use of force as a substitute for trust to maintain order are likely to be less efficient, more costly, and more unpleasant (Putnam, 2000).

### *Towards a productive and economically healthy society*

Trust plays a key role in productive and economically healthy societies, because virtually all types of economic activity require social collaboration of one type or another. In the economic world, people support one another because they believe they are members of a community of mutual trust, albeit it is still a community heavily dependent on rules and

regulations. Though basing the stability and prosperity of society on law, contract, and economic rationality is necessary, it is critical that they be mediated with trust, reciprocity, duty to community, and moral obligation (Fukuyama, 1995). While the former are based on rational calculation, the latter are based on social practice and habit.

Communities that rely upon these shared ethical values require less extensive regulation, fewer contractual agreements or other forceful means of ensuring honesty. An existing moral consensus gives group members a basis for trusting one another (Fukuyama, 1995; Putnam, 2000).

The degree of collaboration and involvement needed to create social capital and a moral community cannot be acquired through a rational investment decision. One must become habituated to the moral norms and virtues of a trusting community. However, the community itself must adopt norms as a whole before trust can become generalized among its members (Fukuyama, 1995).

### *Social capital*

There is little argument that our lives are made more productive by the social ties we are able to establish and maintain. That is, we can get more done through the cooperation and mutual sharing of our trusting relations with others. The connectedness between individuals, in terms of social networks, and the normative reciprocity and trustworthiness that arise from it is collectively referred to as *social capital*. There is no single way to produce social capital, though it can be created by any number of possible mechanisms in part or all of a society. Regardless, it has the effect of helping people resolve collective problems more easily, allows communities to function with less internal friction, and makes people more aware of their

interconnectedness (Putnam, 2000). There are two main components of social capital: organizational capital and human capital. *Organizational capital* refers to the collective knowledge people share among organizations, governments, and other individuals. *Human capital*, on the other hand, refers to the unique skills and expertise possessed by individuals. The combination of organizational and human capital determines the degree to which a community or society can collaborate and cooperate to achieve mutual benefit. Social capital differs from other forms of human capital since it tends to be created and transmitted through cultural mechanisms such as religion, tradition, and historic habit (Fukuyama, 1995). Thus, it is through active cultural mechanisms, that social capital can be nurtured and allowed to grow.

Changes in a society's level of social capital have major implications for the nature of the society itself. Societies with elevated levels of social capital are better able to innovate organizationally, since the corresponding high levels of trust permit a wider variety of social relationships to emerge. Those fraught with distrust, however, are capable of cooperation only under a system of formal rules & regulation. The most useful kind of social capital is frequently not one's ability to work under the authority of a conventional community or group, but rather one's capacity to form new relations and to cooperate within new terms of reference (Fukuyama, 1995).

Americans are entering into voluntary agreements of mutual trust much less frequently than they used to (Putnam, 2000), and have been depleting what seems to be a stored fund of social capital (Fukuyama, 1995), resulting in greater reliance on law and external moderators as social relations dissolve (Putnam, 2000). There are many possible reasons for current declines in social capital. Circumstantial evidence exists suggesting the downturn in social connectedness is due to big government and the growth of the welfare state. By crowding out

private initiative, it is argued, state intervention has subverted civil society. Blame for the losses of local economic ties & increased impersonality is frequently directed at the civic disengagement brought about by the disjoint relation between multinational corporations and communities. While the role of big government, the welfare state, and mega-corporations cannot be ruled out, the losses in social capital are more commonly attributed to pressures of time and money, changes related to urban sprawl, electronic entertainment, and generational changes (Putnam, 2000).

### *The role of trust in enduring social relationships, social connections, and social capital*

The ability of individuals or organizations to associate with one another depends on the degree to which they can put their own interests aside and integrate with the norms and values of the larger community. Since shared values are requisite for trust (Fukuyama, 1995), as mutual trust thrives, so does the rest of the exchange (Robinson, Kraatz, & Rousseau, 1994). A healthy and vibrant civil society is required for the vitality of political & economic institutions (Fukuyama, 1995).

As one would expect, trust is not a black-and-white characteristic; it falls upon a continuum, with trust and distrust as polar opposites. People can not only have varying degrees of trust in different people, but they can also have varying degrees of trust in the same person to do different tasks (Blackburn, 1998). We may trust one auto mechanic over another to replace our car's transmission, but would likely trust neither auto mechanic to perform our dental work. The types of trusting relationships people get involved with vary highly as well. The *thick* relationships that develop with close friends and business partners is very different

from the *thin* relationships that develop with people we regularly pass in the hallway, or the cashier at the grocery store. Thick trust tends to be far stronger and more stable than the weaker and more fleeting thin trust. Despite the fact that thin trust cannot be relied upon to the same extent that thick trust can, Putnam (2000) believes thin trust may in fact be more important than thick because it extends our *radius of trust* beyond the groups of people that we know personally. It must be noted, however, that with declining social capital, and decreased willingness to trust those we do not know well, comes a decreasing radius of trust and a reduced ability to rely upon thin trust.

### *Distrust*

Up to this point, trust has been discussed as being predominantly positive, but normatively speaking, it is neither good nor bad; neither a virtue nor a vice. Distrust is generally thought of to be a complement of trust, in which one either has grounds for trust or grounds for distrust. Without a reason for distinction between trusting someone and distrusting them (say, because you just met them), it could be said that one simply has a lack of trust (Levi, 1998).

There are four primary reasons for distrusting rather than trusting: 1) The circumstances of an established relationship have changed; 2) One party falsified their situation for individual gain; 3) The potential outcome may have changed; and/or 4) The parties did not fully understand or express their desires, intentions, and expectations (doing so may be impossible). Distrust needs only to be based on a small portion of any of these factors whereas to be fully trusting requires a thorough knowledge of other parties' incentives (Hardin, 2003). Thus, distrust comes much more easily than trust.

Active distrust may, in fact, be the more appropriate descriptor in certain situations than trust or a lack of trust (Levi, 1998), as trusting the malevolent or incompetent may prove to be foolish or harmful (Hardin, 2000). When fundamental interests conflict, as may occur between workers and management, or when citizens are concerned about protecting themselves from intolerant majorities or incursions of state power, there is good reason for parties to be wary of each other. This wariness, or distrust, may even be a contributor to efficient organization.

The U. S. Constitution produced a lasting government organized around distrust by an elaborate system of checks and balances (Kemmis, 1990; Levi, 1998).

“If men were angels, no government would be necessary. If angels were to govern men, neither external or internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself. A dependence on the people is, no doubt, the primary control on the government but experience has taught mankind the necessity of auxiliary precautions.”

*James Madison, Federalist Paper no. 51, p. 322*

Without trust, interaction can only occur under a system of formal rules & regulation. These are inherently inefficient, as resources must be expended in order to negotiate, litigate, and enforce them, sometimes by coercive means (Fukuyama, 1995; Kramer & Tyler, 1996). Distrust is the motivating force behind land zoning. Parties simply do not trust one another sufficiently to expect everybody to behave according to societal norms, and one bad apple spoils the batch. Land use zoning is, therefore, a regulatory approach to provide a predictable

framework for use and development of land. It is a clear signal by the community of what behavior is considered acceptable and what isn't

### *Trust and Government*

**Trust in government?** The trust that we place in individuals is notably distinct from that which we can place in government (Hardin, 1998, 1999, 2000; Putnam, 2000). Interpersonal trusting relationships tend to be far richer and more directly reciprocal than the relationship a citizen can have with government (Hardin, 2000). In part, this is because government is so immense and has so many potential controllers, that it cannot *specifically* be trusted, and one cannot develop a truly reciprocal relationship with it. Distinct associations are required for trusting relations, and most times government cannot be concerned with relationships between specific parties. Thus, one cannot speak of specifically having "trust" in government. References to fluctuations in trust should be viewed in terms of increased or decreased *confidence* that government will perform as expected, or the extent to which the government can be considered to be trustworthy (Hardin 2000; Levi 1998). Confidence in government or in a governmental agency can easily be based upon one's generalizations of the institution's previous behavior (Hardin, 2000). The extent of confidence, obviously, will depend on the government or agency, and can range from absolute certitude to utter cynicism (Miller 1974a).

The U. S. Government was constructed on a foundation of low trust. According to Carnevale (1995), low trust is both the "cause and consequence of [governmental] arrangement and management practices that strangle individual achievement and institutional accomplishment" (p. 3). Because government agencies do not trust the judgment of public servants, most times individual employees cannot make even minor changes that they believe

would make government perform better. Government has become excessively reliant on dated bureaucratic organizational arrangements. In this typically hierarchical organization, roles are defined narrowly to maximize control, with ends frequently being subordinate to means (Carnevale, 1995). Because of this, employees are restrained to specific roles, and non-traditional forms of problem solving are discouraged. Hierarchies, however, are necessary because not all people can be consistently trusted to behave according to normative ethics and contribute their fair share to an institution (Fukuyama, 1995).

Government, occasionally, is central to establishing levels of trust among citizens that would otherwise not be possible. Government can make possible a broad range of social, political, and economic transactions that are otherwise difficult to create. Critical to doing so is its use of coercion, rightly understood and used. Moreover, there is some reason to believe that democratic institutions may be even better at producing generalized trust than non-democratic institutions, in part because they are better at restricting the use of coercion to tasks that enhance trust rather than to those that undermine it. However, depending on the nature and personnel of government agencies, agencies may sometimes be responsible for the destruction of interpersonal trust, either directly or by destroying the institutions that support it (Levi, 1998). Trust of the institution has additional consequence for governance: not only does it affect the level of the public's tolerance of the administration, but it also affects the extent to which the public is willing to comply with governmental demands and regulations. Destruction of trust in government may lead to widespread antagonism toward policy and even active resistance, and may be one source of increased social distrust (Levi, 1998).

When feelings of powerlessness and normlessness accompany hostility toward political and social leaders, the institutions of government, and the administration as a whole, simply

replacing the administrators of questionable systems will have little, if any, effect on restoring confidence in government or the political system (Miller, 1974a). To reduce or eliminate the trust-destroying components of government bureaucracy, the government needs to be made more flexible and adaptable to change in order to increase levels of trust and social capital. However, the ability of institutions, to move from large hierarchies to smaller, more flexible networks is dependent upon the degree of trust and social capital already present in broader society (Fukuyama 1995). This makes increasing confidence in government difficult, but not impossible, as small, incremental changes can be made. Further adding to this cycle is the fact that in order for trust to be built, citizens must have faith in the competence of government to do so (Levi, 1998). But simply restoring trust in authorities does not guarantee that conflicts with government will be resolved (Tyler & Degoey, 1995). Not only must government behave trustworthily, other citizens must as well (Levi, 1998). Without reciprocal trustworthiness, little progress can be made towards resolving societal problems.

Trust is crucial in nearly every aspect of life. It is critical for communities, economic productivity, and building and maintaining social connections. The preceding sections have sought to establish how important trust is, and the role it plays in interactions with government. With that, we will next identify what its causes and influences are, as well as how to measure it.

## **Definitions of Trust**

To say that one trusts something, or that one has trust in an entity, says little of the nature of the relationship between the individual and whomever they happen to be trusting.

Because the meaning of trust can be so varied, and may in fact be context specific, it is nearly impossible to develop a single definition. Instead, we propose several dimensions that may or may not exist in trusting relationships. Their presence or absence indicates not only the degree of trust but also provides more specific indicators of changes in relationships that affect trust. In general, trust is the process by which one accepts the assignment of responsibility to work on certain tasks to other persons, groups, agencies, or institutions (Earle & Cvetkovich, 1995). With the use of a modifier, one can clarify the scope of what they mean by trust. Suddenly what was simply “trust” is refined to refer to political trust, social trust, interpersonal trust, organizational trust, one of seemingly innumerable specific types of trust, or even trust at its broadest scale: generalized trust. Classifying trust in this manner however, sets the context for a relationship, rather than defines it. Despite this, there are a series of components that are present in varying degrees in every trusting relationship that more fully describe it: shared norms and values, contingent consent, and perceived knowability.

### *Shared norms and values*

Francis Fukuyama, one of the best known commentators on trust, claims that “trust is the expectation that arises within a community of regular, honest, and cooperative behavior, based on *commonly shared norms*, on the part of other members of that community” (p. 26) [emphasis added]. He contends that common norms can refer to complex value questions, such as “the nature of God or justice,” but that norms can also include more tangible norms such as professional standards or codes of behavior (1995).

The extent to which communities have shared norms and values, and are able to place shared goals above individual ones, is heavily mediated by the extent we can relate to others. Formally establishing contracts and acting within one's self interest are important ways of relating to others, while still remaining cautious. However, an agreed upon moral standard gives members of the group a basis for mutual trust, negating the need for extensive contractual and legal regulation (Fukuyama, 1995). In essence, when we trust one another, and have a true understanding of how each will act, we can operate outside of the arena of formal rules and regulations; we trust that the other party will not act maliciously. This provides escape from regulatory oversight, accounting and control, and leads to greater flexibility, responsiveness and efficiency of action. Thus, to benefit from this efficiency, individuals and organizations may invest a good deal of resources into building and strengthening trusting relationships; they are very easy to destroy, but are quite difficult to construct (Levi, 1998). Based on a review of the scientific literature, Box 1 shows the six dominant bases of support identified for the shared norms and values dimension.

## Box 1

### Bases of support for shared norms and values:

- ❖ *Integrity* (Citrin and Muste, 1999): Honesty, morality, good character, and honor.
- ❖ *Worthy of Pride* (Citrin and Muste, 1999): Conducting one's self in a manner that is respectful and highly regarded.
- ❖ *Compassionate and Understanding* (Citrin and Muste, 1999): Sympathetic and concerned with the welfare of others.
- ❖ *Agreement* (Institute for Social Research, 1999): A belief that parties have parallel objectives which can be implemented through normatively appropriate means.
- ❖ *Procedural Justice* (Mason, House, and Martin, 1985): A fair, equitable process developed through legitimate means.
- ❖ *Responsiveness* (Citrin and Muste, 1999): Receptiveness and ability to adapt to meet changing needs and circumstances.

### *Contingent Consent*

One common component of any definition of trust is that people voluntarily trust one another only if they feel the other person is worthy of being trusted. That is, people are likely to trust others only to the extent that they believe their interests will be respected, that other parties will act in a trustworthy manner, and that their trust will be reciprocated by those involved. Collectively, these three factors are part of *contingent consent*, the hypothesized second dimension of trust. Contingent consent refers to a citizen's decision to voluntarily comply with demands from individuals or organizations *only* if they perceive the other parties to be trustworthy and are satisfied that others citizens are acting reciprocally (Levi, 1998).

Box 2 shows the three dominant bases of support have been identified in the contingent consent dimension:

**Box 2**

**Bases of support for contingent consent:**

- ❖ *Trustworthy behavior* (Citrin and Muste, 1999): Conducting one's self in a manner that warrants the trust of others.
- ❖ *Membership in the political community* (Mason et al., 1985): Having a say or role in relevant decision-making processes in an arena where one's interests are valued.
- ❖ *Confidence* (Institute for Social Research, 1999): Being able to act with faith, certainty, or assurance.

***Perceived Knowability***

The third hypothesized dimension of trust is perceived knowability, or what people believe they know about how others will act. Trust begins to form among parties when each acts in a manner the other expects (Fukuyama, 1995). Expectations are inherently perceptual and are derived from implicit or explicit promises of future exchange or reciprocity among parties (Blackburn, 1998). Each party in a relationship possesses his or her own understanding of the mutual obligations that define a relationship. Based on that expectation, parties begin to rely upon others to behave in a particular manner. In doing so, they tend to rely upon other people to do certain things, but not to do others. Unless circumstances have recently changed, parties expect others to do what they've always done. Box 3 shows the identified bases of support for perceived knowability.

### Box 3

#### Bases of support for perceived knowability:

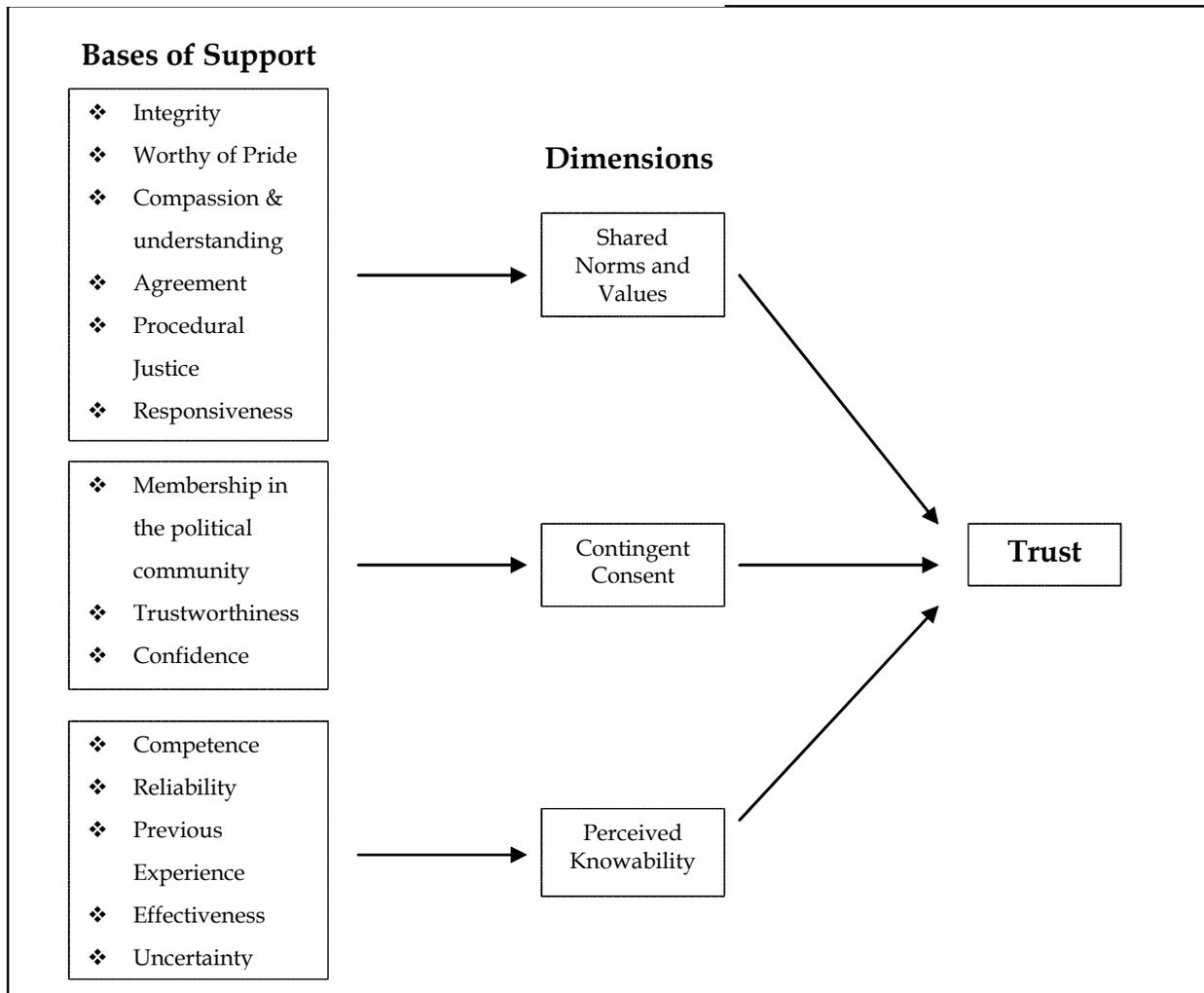
- ❖ *Competence* (Miller, 1974): One's ability to effectively implement their skills, knowledge, or expertise in a given arena.
- ❖ *Reliability* (Fukuyama, 1995): The extent to which one can be counted upon to perform a given function, or behave in a certain manner.
- ❖ *Previous Experience* (Fukuyama, 1995): Earlier interactions parties have with others that color their attitudes of consistency and familiarity.
- ❖ *Effectiveness* (Citrin and Muste, 1999): The ability of parties to successfully accomplish goals and have an impact on a given object.
- ❖ *Uncertainty* (Mason et al., 1985): The grades of knowability associated with engaging in a relationship with certain parties or performing certain actions.

### Summary

Despite the high discrepancy in what trust is, it is composed of three common elements: First, trust is built upon a series of shared norms and values, which provide a basis for trust. Second, according to the theory of contingent consent, trusting others is in one's self interest, and one should be able to expect trustworthy, reciprocal behavior from others. Third, parties can be expected to behave as they have in previous encounters and, given a choice, will trust those they can rely upon and with whom they have had previous positive experiences.

The following graphic, Figure 1, shows the hypothesized causal diagram of trust. Each group of components on the left contributes to one of the three trust dimensions, which in turn contribute to trust.

**Figure 1:** Hypothesized Causal Diagram of Trust



## Project Justification

The Bitterroot Ecosystem Management Research Project (BEMRP) is funded by the Rocky Mountain Research Station, but is guided by a consortium of Forest Service (RMRS) scientists, the College of Forestry and Conservation at the University of Montana, the Forest Service Northern Region, and the Bitterroot National Forest. BEMRP is committed to “...understanding public values and how they change through time relative to the social acceptability of different fuel treatment strategies.” BEMRP scientists are also interested in identifying “social barriers to implementing ecosystem restoration and fuel treatment activities, including distrust of government” (BEMRP Research objectives for FY 03-10/9/02). These current objectives are driven in part by a proposition arising from the post fire assessment for the 2000 Bitterroot Valley Fires in Montana (BBER, 2001), that there is a lack of public trust in the agency’s ability to make fire management decisions that reflect local values. Bitterroot Valley Residents often suggested that fire management decisions were made by “outsiders” (e.g., the Washington office, environmental groups, out of state crew leaders, etc.) who possessed little understanding of the relationships local people have with natural resources there or how fire management decisions affect those relationships.

As federal agencies become more cognizant of the importance of collaboration through all stages of resource management decision making, public trust is likely to become a long-term indicator of success of the agency’s ability to protect or restore relationships between the public and public lands (Machlis, Kaplan, Tuler, Bagby, and MacKendry, 2002). This project uses a community-wide assessment of public trust in the Forest Service’s ability to make fire and fuel treatment management decisions that consider local values in meeting public purpose

mandates of public lands. This baseline assessment can serve as the foundation to measure success of a long-term, landscape-level ecosystem management project that assesses and maps meanings attached to the landscape, models long-term effects of fire on the landscape, and collaborates with local citizens and conservation groups to determine fuel hazard reduction direction in the Bitterroot Valley. The findings from this project can provide input to collaborative planning direction for other fuel management programs specifically and federal agency management generally, across the United States.

## Measurement of Trust

All forms of trust exist in relation to specific objects, and people respond differently to different forms of trust in different circumstances. Focusing on the relationships of trust that exist between government and communities, *political trust* is a complex phenomenon, and as such, its type and measurement have been greatly debated. Political trust is not an entity unto itself, but rather is a reflection of one's support for a given politician, political group, process or institution. In order to fully reflect these attitudes toward government, the reasons or bases for trusting must also be identified (Citrin and Muste, 1999). However, little consensus exists about crucial conceptual issues such as what political trust means specifically, or what bases of support are most important. With this conceptual divergence, innumerable methods exist for measuring trust in government, each rooted in its own set of assumptions (Ulbig & Alford, 2001; Citrin & Muste, 1999). Nonetheless, in order to develop our understanding of the sources and implications of political trust, an accurate method must be chosen to measure it.

Though it is frequently done, to get a thorough understanding of trust, more is required than simply to ask whether citizens agree or disagree with government actions, or a few questions targeting trust in a specific agency (Davis, 1978; Earle & Cvetkovich, 1998; Miller, 1974; Winter, Palucki, & Burkhardt, 1999). Trust is a multidimensional phenomenon (Ganesan & Hess, 1997; Johnson, 1999; Rousseau, Sitkin, Burt, and Camerer, 1998), and should be treated as such. In light of trust's multi-dimensionality, attempting to measure trust without a full understanding of its complexity provides a number of implications on the validity of trust measures. Among these are the notions that trust may not be cognitively accessible by survey respondents, that it may be impossible to condense into a single response,

that questions are open to strategic responding, and that a one-dimensional measure of trust may provide insufficient content validity. Therefore, it may not in fact be possible to validly and precisely measure trust directly. Rather, it is possible to measure trust indirectly by measuring the components in each dimension. Trust's components, or bases of support, are more tangible and thus more easily measured. By identifying the most relevant components, an accurate measure of trust can be made (Citrin and Muste, 1999).

### *Trust Measures*

Survey questions from previous trust studies (Davis, 1978; Greenberg and Williams, 1999; Institute for Social Research, 1999; Jukam, 1977; Mason, House, and Martin, 1985; Miller, 1974; Muller and Smith, 1981; Selnes, and Sallis, 2003) were matched with previously identified bases of support in each trust dimension, and were adapted to the context of fire and fuel management in the Bitterroot National Forest. When survey items were not available from these sources, new survey items were proposed, to ensure all theorized bases of support were included (see Boxes 1-3). Items were also included to measure residents' opinions of general management of the Bitterroot National Forest. On a larger scale, looking at the US Forest Service in general, the Salient Values Similarity trust model developed by Earle and Cvetkovich (1995), modified by Winter et al. (1999) and Borrie et al. (2002), was also included. Additionally, items about the general management of the federal government (Miller, 1974), and trustworthiness of other people in general were included (Davis, 1978). All questions are shown in Boxes 4 a-c and 5 a-b.

## Box 4a: Survey Items for Shared Norms

### Shared Norms and Values

**[Integrity]** *When managers of the Bitterroot National Forest speak on television, radio, in newspapers, or at public meetings about forest fires, how often, if at all, do they tell the truth?* (Muller and Jukam, 1977)  
Always (4) to Never (1)

**[Worthy of Pride]** *Would you say that you are proud of the way fire is managed on the Bitterroot National Forest, or that you can't find too many things about the fire management to be proud of?* (Mason, House, and Martin, 1985)  
Proud of fire management (1); Can't find too many things to be proud of (0)

**[Compassion & Understanding]** *I believe the Bitterroot National Forest staff demonstrates a general attitude of compassion when fighting fires.* (Selnes, and Sallis, 2003)  
Strongly agree (4) to Strongly disagree (1)

**[Agreement]** *Generally speaking how satisfied are you, if at all, with the way the Bitterroot National Forest staff deals with fires?* (Institute for Social Research, 1999)  
Very satisfied (4) to Very dissatisfied (1)

**[Agreement]** *Generally speaking how satisfied are you, if at all, with the way the Bitterroot National Forest staff deals with forest fuels?* (Institute for Social Research, 1999)  
Very satisfied (4) to Very dissatisfied (1)

**[Procedural Justice]** *How often, if at all, do you think fires on the Bitterroot National Forest are managed according to a fair process?* (Created)  
Always (4) to Never (1)

**[Responsiveness]** *Managers on the Bitterroot National Forest respond to the needs of local residents when fighting fires.* (Selnes, and Sallis, 2003)  
Strongly agree (4) to Strongly disagree (1)

**[Shared Norms and Values]** *To what extent, if at all, does the Bitterroot National Forest share your values about fire management?* (Earle and Cvetkovich, 1995)  
Completely (5) to Not at all (1)

## Box 4b: Survey Items for Contingent Consent

**[Members of the Political Community]** *How much attention, if any, have Bitterroot National Forest managers paid to what people think when managers decide what to do about forest fires?* (Mason, House, and Martin, 1985)  
A good deal of attention (3) to Not much attention (1)

**[Trustworthy]** *Residents of the Bitterroot Valley say that the Bitterroot National Forest staff is trustworthy when fighting fires.* (Selnes, and Sallis, 2003)  
Strongly agree (4) to Strongly disagree (1)

**[Confidence]** *How much, if any, confidence do you have in wildland fire fighters in general? Do you have?* (Smith, 1981)  
Complete confidence (4) to No confidence at all (1)

**[Confidence]** *What about fire managers in the Bitterroot National Forest? Do you have?* (Smith, 1981)  
Complete confidence (4) to No confidence at all (1)

**[Contingent Consent]** *Considering that the Bitterroot National Forest is managed on behalf of everyone, how satisfied are you, if at all, with fire management in the Bitterroot National Forest?* (Institute for Social Research, 1999)  
Very satisfied (4) to Very dissatisfied (1)

#### Box 4c: Survey Items for Perceived Knowability

**[Competence]** *Based on your observations and experiences what portion, if any, of the people who manage forest fires in the Bitterroot National Forest know what they are doing? (Miller, 1974)*  
All (4) to None (1)

**[Reliability]** *I find the Bitterroot National Forest staff to be reliable when managing fires. (Muller and Jukam, 1977)*  
Strongly agree (4) to Strongly disagree (1)

**[Reliability]** *I find the Bitterroot National Forest staff to be reliable when managing forest fuels. (Muller and Jukam, 1977)*  
Strongly agree (4) to Strongly disagree (1)

**[Previous Experience]** *In the past how pleased, if at all, have you been with the way fires in the Bitterroot National Forest were managed? (Created)*  
Very pleased (4) to Very displeased (1)

**[Effectiveness]** *In your community, how would you rate the effectiveness of Bitterroot National Forest fire managers in dealing with fire-related issues? (Created)*  
Excellent (4) to Poor (1)

**[Effectiveness]** *When fighting fires, do you think that the Bitterroot National Forest staff generally: (Miller, 1974)*  
Wastes a lot of the money (3); Wastes some money (2); Doesn't waste very much money (1)

**[Uncertainty]** *How sure, if at all, have you felt that forest fires threatening your community or your property would be put out in time? (Created)*  
Very sure (4) to Very unsure (1)

**[Uncertainty]** *To what extent, if at all, do you agree or disagree with the following statement: Science can settle differences of opinion about the risks and benefits from forest fires? (Greenberg and Williams, 1999)*  
Strongly agree (4) to Strongly disagree (1)

Citrin and Muste (1999) identified several methodological guidelines for the evaluation of existing trust scales and the construction of new ones. These guidelines were followed in the construction of new survey items.

- Ensure that the attitude object (agency, institution, leader, etc.) is specified as clearly as possible
- Evaluate the attitude object according to appropriate normative standards
- Incorporate items referring to competing systems of governance when measuring support of a given regime

## **Box 5a: Survey Items for Bitterroot, USFS, and Federal Government general management**

### **General Management of the Bitterroot National Forest**

*How satisfied are you, if at all, with the overall management of the Bitterroot National Forest?*

Very satisfied (4) to Very dissatisfied (1)

*In the past, how pleased, if at all, have you been with the way the Bitterroot National Forest in general was managed?*

Very pleased (4) to Very displeased (1)

*How much, if any, confidence do you have in managers of the Bitterroot National Forest in general? Do you have*

Complete confidence (4) to No confidence at all (1)?

*To what extent, if at all, does the Bitterroot National Forest share your values about managing the Bitterroot National Forest in general?*

Completely (5) to Not at all (1)

### **General Management Of The USDA Forest Service**

*The USDA Forest Service supports my views.*

Supports my views (5) Opposes my views (1)

*The USDA Forest Service has similar goals to mine.*

Has similar goals to mine (5) Has different goals than mine (1)

*The USDA Forest Service thinks like me.*

Thinks like me (5) Does not think like me (1)

*The USDA Forest Service shares my values.*

Shares my values (5) Does not share my values (1)

*The USDA Forest Service is like me.*

Is like me (5) Is not like me (1)

### **General Management of the Federal Government**

*Now what about the government in general? Do you think the federal government?*

Wastes a lot of the money (3); Wastes some money (2); Doesn't waste very much money (1)

*How much of the time, if at all, do you think you can trust the government in Washington to do what is right?*

All of the time (5) None of the time (1)

## **Box 5b: Survey Items for Trustworthiness of People in General**

*Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?*

Try to be helpful (1) Just look out for themselves (0)

*Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?*

Would take advantage of you (1) Would try to be fair (0)

*Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?*

- Use a multi-format approach when constructing items to minimize the influence of response sets inherent in yes-no formats
- Test predictions across a broad range of political theories including attitude-behavior reactions to strengthen evidence of validity

Citrin and Muste (1999) also suggested that test-retest data be collected to ensure that enduring attitudes are reflected, rather than fleeting emotional responses. Because of monetary restraints, it was not possible to collect data such as these. There is, however, comparability between some items from the 2000 post-fire assessment, as well as initial testing of potential items for future monitoring of trust in the study area.

Bianco (2001) theorized that survey responses may be colored by previous statements about the trustworthiness of elected officials, and believed the specific context of trust survey questions to be important. To prevent this, question ordering must also be examined prior to survey implementation.

## Data Collection

### *Methodology*

The sample population was defined as all households with a functional telephone in Ravalli County, Montana (That is, in and around the towns of Hamilton, Victor, Stevensville, Darby, Sula, and Alta). A telephone survey was administered by the University of Montana's Bureau of Business and Economic Research (BBER) using a random-digit dial process. A Kish table was used to randomly select respondents within households (Kish, 1949). Previous application of this method on a multi-state project yielded a 52.4% response rate (Borrie et al., 2002), though application of this method in the Bitterroot Valley post-fire assessment previously yielded an 87% response rate (BBER, 2001). Community residents have shown sincere interest in fire and fuels management, and high levels of cooperation were anticipated for the study.

10 initial pilot-tests were conducted with graduate students and faculty at the University of Montana College of Forestry and Conservation, as well as with researchers at the Aldo Leopold Wilderness Research Institute, all of whom were at least generally familiar with fire management issues on the Bitterroot National Forest. As part of further pilot-testing, cognitive interviews were conducted by BBER with four residents of the Bitterroot Valley. The cognitive interviews used both concurrent thinkalouds and concurrent probes in order to investigate respondents' thought processes when answering the survey, and to explore potential problems with survey questions (Sudman, Bradburn, and Schwartz, 1996). After refinement of the survey based on the results of the cognitive interviews, telephone interviewers conducted a pilot test of the survey to approximately 100 Lolo residents to

examine question wording, question order, and technical implementation of the survey. The survey instrument is included as appendix A.

The segmentation analysis, was based on the dimensionalization of trust presented earlier in this report, and was used to measure the relative level of trust residents had in the US Forest Service to manage forest fuels and fires in the Bitterroot. Segments were developed through an analysis of the identified bases of support for each dimension: shared norms and values, contingent consent, and perceived knowability.

### *Sampling in the Bitterroot*

The assessment following the fires of 2000 divided the Bitterroot region of Ravalli County, Montana, into three separate sampling areas based upon hypothesized differences in population (BBER, 2001). To assist in comparison between this survey and the earlier survey, the boundaries were preserved. The North region is centered about Stevensville, the central region includes Hamilton and Victor, and the South region contains Darby, Sula, and Alta. The methodology used to estimate the statistically relevant sample sizes for each region in the 2000 post-fire assessment was based on conservative estimates of variation of the known population sizes, with desired accuracy of  $\pm 5\%$  and 90% confidence. Data from the 2000 Census were used to estimate desired sample sizes for the current project. The final sample was, thus, not collected directly to represent the county population proportionately. Consequently, in order to faithfully represent the population of Ravalli County, a weighting scheme was developed based upon the following formula:

$$W_r = \frac{\left(\frac{R_p}{T_p}\right)}{\left(\frac{R_s}{T_s}\right)}$$

where  $W_r$  is the weight for each region,  $T_p$  is the total population size,  $T_s$  is the total sample size,  $R_s$  is the size of the sample from each region, and  $R_p$  is the size of the population in each region. Weighting data are included in Table 1.

**Table 1:** Regional Characteristics, Sample Sizes, and Sample Weighting

Sample Area	Telephone Exchanges	No. Households*	% Households	Required Sample Size	Actual Sample Size	% Sample	$W_r$
North	777	4601	32.20%	355	393	34.11%	0.943866
Central	363, 375, 642, 961	8353	58.46%	367	396	34.38%	1.700583
South	349, 821	1335	9.34%	298	363	31.51%	0.296500
Total		14289	100.00%	1020	1152	100.00%	1.000000

\* Based on 2000 US Census Data;

# Results

## *Overall Sample characteristics (weighted)*

1690 distinct contacts were made with qualified respondents in Ravalli County. Including those that rescheduled appointments with telephone interviewers multiple times, but never completed a survey, slightly more than 1/4 of all attempted calls were refusals. In addition, about 5% of all households contacted were considered “valid, but non-interviewable” because respondents were incapable of completing the survey during the sampling period due to illness, previously scheduled vacations, or other uncontrollable factors. This resulted in 1164 completed surveys. Twelve completed surveys were lost in a corrupted data file, yielding 1152 usable surveys with a final response rate of 68%.

## *Sociodemographics*

The overall sample was almost evenly split across gender, with 48.6% male, and 51.4% female, closely matching proportions identified in the 2000 US census for Ravalli County (49.7% and 50.2%, respectively). The age of respondents ranged from 18 to 91 years in age, with a mean age of 51.66 years (SD = 16.81). Residents lived in Ravalli County on average for 19.17 years (SD = 16.52), including a maximum of 91 years, and a minimum of less than one year. These results are presented in Table 2.

**Table 2:** Respondent age, number of years in Ravalli County, and number of years in Montana.

	Mean	Median	Std. Dev.
Age	51.66	52.00	16.81
Years in Ravalli County	19.17	14.00	16.52
Years in Montana	26.23	21.00	20.38

**Education.** Nearly 95% of respondents have at least a high school diploma or GED, with more than a quarter having graduated from college, and less than 10% possessing a graduate degree.

**Income.** In the sample, nearly two-thirds of households have an annual income of between \$20,000 and \$75,000. Data from the 2000 US census closely mirrors this distribution, though higher incomes were slightly over-sampled and lower incomes slightly under-sampled, relative to census data. Data on income are presented in Table 3.

**Table 3.** Respondent place of residence, gender, education, and income.

		Sample		Census <sup>a</sup>		Percentage
		n	%	n	%	Differential <sup>b</sup>
Town	Stevensville	371	32.2	12279	34.1	1.9
	Hamilton	602	52.3	17489	48.5	-3.8
	Victor	71	6.2	2839	7.9	1.7
	Darby/Sula	99	8.6	3454	9.6	1.0
	Alta	9	0.8	-	-	-
	Total	1152	100.0	36061	100.0	
Gender	Male	559	48.6	17,951	49.8	1.2
	Female	593	51.4	18,119	50.2	-1.2
	Total	1152	100.0	36,070.0	100.0	
Education	Less than High School	62	5.5	3031	12.4	6.9
	High School Grad or GED	473	41.8	7738	31.6	-10.2
	Some college	279	24.7	8200	33.5	8.8
	College Graduate	208	18.4	3897	15.9	-2.5
	Graduate Degree	110	9.7	1631	6.7	-3.0
	Total	1132	100.0	24497	100.0	
Income	> \$100,000	75	8.1	956	6.7	-1.4
	\$75,000-\$99,999	72	7.8	710	5.0	-2.8
	\$50,000-\$74,999	200	21.7	2210	15.5	-6.2
	\$35,000-\$49,999	171	18.5	2696	18.9	0.4
	\$20,000-\$34,999	229	24.9	3809	26.7	1.8
	\$15,000-\$19,999	60	6.5	1291	9.1	2.6
	\$10,000-\$14,999	69	7.5	1171	8.2	0.7
	< \$10,000	46	5.0	1416	9.9	4.9
	Total	922	100.0	14259	100.0	

<sup>a</sup> Data taken from 2000 US Census. Comparisons are between survey respondents and residents of Ravalli county, or where specified, particular towns in Ravalli County.

<sup>b</sup> Differential is calculated by subtracting survey percentage from census percentage.

<sup>c</sup> US Census data includes Alta in the Darby and Sula county subdivisions.

## Regional Background

**Residence.** 98.3 percent of total respondents indicated that they considered Ravalli County to be their primary place of residence. Two thirds of respondents considered themselves to live “in town,” while the remaining considered themselves to live either “on the edge of town,” or “outside of town.” Similarly, two-thirds consider themselves to live outside of forested areas, while the remainder consider themselves to live on the edge of a forested area or in a forested area. Nearly one-fifth believe they live within one-half mile of the boundary of the Bitterroot National Forest. These results are presented in Table 4.

**Table 4:** Residence location

Item	Response	n	%
Location of Primary Residence	Outside of Ravalli County	20	1.7
	In Ravalli County	1122	98.3
	Total	1142	100.0
Location relative to town	Outside of town	257	22.6
	On the edge of town	178	15.6
	In town	705	61.9
	Total	1140	100.0
Location Relative to Forest	Live in a forested area	132	11.6
	Live on the edge of a forested area	267	23.5
	Live outside a forested area	740	64.9
	Total	1139	100.0
Live within 1/2 mile of BNF Boundary	No	938	82.4
	Yes	201	17.6
	Total	1139	100.0

**Regional involvement.** About 20% reported having worked in a job that helped to fight fires in the Bitterroot Valley. Less than 10% claim membership in an organization that has the management of the Bitterroot National Forest as one of its interests. (Such organizations include, but are not limited to the Rocky Mountain Elk Foundation, Friends of the Bitterroot, Alliance for the Wild Rockies, and Timberworkers United. A complete list is given in

Appendix B). Nearly 25% have worked for the Forest Service, or live with someone who has. These results are reported in Table 5.

**Table 5.** Respondent involvement in forest issues

Item	Response	n	%
Have worked in a job that has helped to fight fires in the Bitterroot	Yes	202	17.6
	No	947	82.4
	Total	1149	100.0
Member of a group with interests in the management of the BNF	Yes	100	8.8
	No	1031	91.2
	Total	1131	100
Self or HH member works for USFS	Yes	278	24.5
	No	855	75.5
	Total	1133	100.0

**Fire Experience.** A group of questions were about Bitterroot residents’ experience with fires in and around the Bitterroot National Forest. These results are reported in Tables 6a and 6b.

Generally, responses are not much different from those given in the 2000 post fire assessment<sup>1</sup>.

Some notable results (with comparable 2000 data in parentheses) are that:

- Nearly 90% (compared with 84% in 2000) claim to have been either somewhat affected or very affected by smoke from Bitterroot fires
- About 15% (13%) have been told to prepare to evacuate, but not required to
- About 8% (8%) have been evacuated
- 2% (2%) have been told to evacuate, but refused to

<sup>1</sup> The 2000 post-fire assessment asked respondents only about their experiences in the Bitterroot during the severe fire season of 2000. The current survey, however, affixed no time scale to respondents’ fire experiences in the Bitterroot. This probably accounts for the notably higher percentages in this survey when compared to the 2000 post-fire assessment

**TABLE 6a:** Respondent's personal experience with fire in the Bitterroot.

Item	Response	2004		2000
		n	%	%
Have been affected by smoke from fires in the Bitterroot*	Not at all	138	12.1	-
	Somewhat	494	43.1	-
	Very	513	44.8	-
	Total	1145	100.0	-
Have been evacuated from your home	No	1056	92.3	91.7
	Yes	88	7.7	8.3
	Total	1144	100.0	100
Have prepared to evacuate, but not required to	No	973	85.1	87.1
	Yes	171	14.9	12.9
	Total	1144	100.0	100
Have been told to evacuate, but refused	No	1116	97.5	97.7
	Yes	28	2.5	2.3
	Total	1144	100.0	100

\* Scale differences prevent comparison

**TABLE 6b:** Some Economic Effects of Fire in the Bitterroot

Item	Response	2004		2000
		n	%	%
Have lost hours at work because of fires in the Bitterroot	No	984	85.7	79.7
	Yes	165	14.3	20.3
	Total	1149	100.0	100
Have worked more hours because of fires in the Bitterroot	No	977	85.7	81.2
	Yes	164	14.3	18.8
	Total	1141	100.0	100
Business or employer lost money because of fires in the Bitterroot	No	882	79.9	80.2
	Yes	221	20.1	19.2
	Total	1103	100.0	100
Business or employer made more money than usual because of fires in the Bitterroot	No	975	88.7	88.5
	Yes	124	11.3	11.5
	Total	1099	100.0	100.0

**Opinions of fire management on the Bitterroot National Forest.** A series of questions asked Bitterroot Residents about their opinions of fire management in the Bitterroot National Forest. Full results are reported in Appendix B. With respect to Ravalli County, some notable results include:

- More than 60% are either somewhat satisfied or very satisfied with how the Bitterroot National Forest deals with fires
- More than 40% are either somewhat satisfied or very satisfied with how the Bitterroot National Forest deals with forest fuels
- More than 60% have either quite a lot of confidence or complete confidence in the Bitterroot National Forest’s fire managers
- More than 80% either somewhat agree or strongly agree that other residents of the Bitterroot believe the Bitterroot National Forest staff to be trustworthy when fighting fires
- More than half are proud of the fire management on the Bitterroot National Forest
- 66% believe that fires on the Bitterroot National Forest are managed according to a fair process

**Opinions on the general management of the Bitterroot National Forest.** A series of questions asked Bitterroot residents about their opinions of the general management of the Bitterroot National Forest. Full results are included in Table 7. Some notable results include:

- 66% are either somewhat satisfied or very satisfied with the overall management of the Bitterroot National Forest
- 70% are either somewhat pleased or very pleased with the way the Bitterroot National Forest has been managed in the past
- Nearly 66% have either quite a lot of confidence or complete confidence in the Bitterroot National Forest managers in general
- When asked whether the Bitterroot National Forest shares their values about managing the forest, on a scale from 1 to 5 (with 1 being not at all, and 5 being completely), almost 75% of those surveyed responded with a 3, 4, or 5.

**TABLE 7a:** Respondent attitudes towards Bitterroot National Forest general management.

Item	Response	n	%
How satisfied are you with the overall management of the Bitterroot National Forest?	Very Dissatisfied	129	11.7
	Somewhat Dissatisfied	232	21.0
	Somewhat Satisfied	574	52.1
	Very Satisfied	166	15.1
	Total	1100	100.0
In the past, how pleased have you been with the ways the Bitterroot National Forest in general has been managed?	Very Displeased	85	7.9
	Somewhat Displeased	224	20.8
	Somewhat Pleased	583	54.2
	Very Pleased	183	17.1
	Total	1075	100.0

**TABLE 7b:** Respondent attitudes towards Bitterroot National Forest general management.

Item	Response	n	%
How much confidence do you have in Bitterroot National Forest managers in general?	No Confidence At All	64	5.8
	Not very much	335	30.8
	Quite a lot	576	52.9
	Complete Confidence	113	10.4
	Total	1088	100.0
To what extent does the Bitterroot National Forest share your values about managing the forest?	[Not at all] 1	95	8.9
	2	174	16.3
	3	373	35.0
	4	319	29.9
	[Completely] 5	105	9.8
	Total	1065	100.0

**Opinions towards the Forest Service.** A series of questions asked Bitterroot residents about similarities between themselves and the Forest Service. Questions were asked on a five point scale (with five representing complete agreement with the statement, and one representing complete disagreement with the statement). These results are presented in Table 8.

- 66% of Ravalli county residents responded<sup>2</sup> that the Forest Service supports their views
- 66% responded<sup>2</sup> that the Forest Service has similar goals to them
- Slightly more than half responded<sup>2</sup> that the Forest Service thinks like them
- More than 60% responded<sup>2</sup> that the Forest Service shares their values
- More than 45% responded<sup>2</sup> that the Forest Service is like them

**Opinions about other people.** A series of questions asked Bitterroot residents about their cynicism towards other people. Although it was not an option, on average 8% of respondents

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<sup>2</sup> Responded with a 3, 4, or 5 on the five point scale

volunteered “it depends” as a response for each of the 3 questions. Results are presented in Table 9.

- About 70% thought that most of the time people try to be helpful
- 70% thought most people would try to be fair
- Slightly more than half believe that most people can be trusted

**TABLE 8:** Respondent's shared norms and values with the US Forest Service.

Item	Response	n	%
USFS supports my views	[Opposes my views] 1	153	14.6
	2	198	18.8
	3	367	34.9
	4	250	23.8
	[Supports my views] 5	83	7.9
	Total	1051	100.0
USFS has similar goals to mine	[Different Goals] 1	157	15.0
	2	211	20.1
	3	326	31.0
	4	255	24.2
	[Similar Goals] 5	102	9.7
	Total	1051	100.0
USFS thinks like me	[Does not think like me] 1	280	27.1
	2	228	22.1
	3	315	30.5
	4	165	15.9
	[Thinks like me] 5	47	4.5
	Total	1035	100.0
USFS shares my values	[Does not share my values]		
	1	188	18.0
	2	222	21.2
	3	312	29.8
	4	216	20.6
	[Shares my values] 5	107	10.3
	Total	1044	100.0
USFS is like me	[Is not like me] 1	329	33.0
	2	210	21.1
	3	275	27.6
	4	136	13.7
	[Is like me] 5	45	4.5
	Total	995	100.0

**Table 9: Respondents' general cynicism**

Item	Response	n	%
Most of the time, people try to be helpful/are mostly looking out for themselves	Look out for themselves	272	24.2
	Try to be helpful	777	69.3
	Depends*	73	6.5
	Total	1122	100.0
Most people would try to take advantage of you/would try to be fair	Try to be fair	778	70.0
	Try to take advantage of you	234	21.1
	Depends*	99	8.9
	Total	1111	100
Most people can be trusted/you can't be too careful in dealing with people	You can't be too careful	439	39.6
	Most people can be trusted	577	52
	Depends*	93	8.4
	Total	1109	100.0

\* Volunteered

### *Further Statistical Analyses.*

#### *Factor Analysis.*

A confirmatory factor analysis<sup>3</sup> using generalized least squares<sup>4</sup> was conducted to test the extent to which 21 dependent variables focusing on the fire management of the Bitterroot National Forest group together. Generalized least squares were used in order to give more importance to variables with substantial shared variance than to those with substantial unique variance.

<sup>3</sup> For all Bitterroot National Forest fire and fuels management variables with missing values, regression analysis was used to estimate the values, treating the variable with missing data as the criterion and all other BNF fire and fuels management variables as predictors. Estimated values were distributed around the norm in a normal pattern. Using this method allows for a more accurate prediction of missing values than assigning the mean value to the missing data. It allows for more degrees of freedom and statistical power than if the case with missing data were eliminated from the analysis.

<sup>4</sup> Unweighted data were used in scale development factor analysis and reliability analysis, because the data were not intended to represent only Ravalli County residents, but rather people in general.

A single factor solution was found to best represent the facets of trust in Bitterroot National Forest fire management. This single factor explained 51.5% of the variance, with all communalities greater than approximately 0.40. Because a solution with only one factor was chosen, no rotation was possible. It should be noted that based on low correlations between one variable (Measuring perceived scientific uncertainty) and all others, question C21 was deleted from further analyses. Detailed results from the factor analysis are presented in Appendix B.

Following the same analytical methods, additional factor analyses were conducted to confirm the inter-relationship of variables within theoretical dimensions of trust: shared norms and values, contingent consent, and perceived knowability. The first hypothesized dimension, shared norms and values, contributes to residents' trust in the Bitterroot National Forest to the extent that respondents believe they share common values with the Bitterroot National Forest. The second hypothesized dimension, contingent consent, contributes to residents' trust of the Bitterroot National Forest through the presence of a belief they have a political voice in the management of the Bitterroot National Forest, that other members are trustworthy, and that their trust will be reciprocated. For the third hypothesized dimension, perceived knowability, Bitterroot residents trust the Bitterroot National Forest if they expect that the actions of Bitterroot National Forest managers will be reliable, effective, and competently made.

In the shared norms and values dimension, eight variables were used to measure respondents' perceptions of the Bitterroot National Forest's fire and fuels management (See Box 4a). A confirmatory factor analysis of these items yielded a single factor solution, accounting for 55.8% of the variance.

In the contingent consent dimension, five variables were used to measure respondents' perceptions of the Bitterroot National Forest's fire management (See Box 4a). These items addressed whether respondents believed they held membership in the "political community" of the Bitterroot National Forest, the extent to which they believed that the Bitterroot National Forest was trustworthy, as well as the amount of confidence they had in them. Here, a single factor solution explaining 61.4% of the variance emerged as the best representation of the data.

In the perceived knowability dimension, seven variables were used to measure respondents' perceptions of the Bitterroot National Forest (See Box 4b). These items addressed the extent to which residents believe the Bitterroot National Forest to be competent, reliable, and effective. In addition, it also addressed Bitterroot residents' previous experience with fire management in the Bitterroot National Forest, as well as the uncertainty they felt when it came to managing fires in the Bitterroot. A single factor solution explaining 60.1% of the variance emerged as the best representation of the data.

Thus, not only was the overall relatedness of all 20 variables used to measure trust confirmed, but the robustness of each of the three dimensions of trust was confirmed. Further analyses were then undertaken to check the reliability of these dimensions and the variables used to measure them. Factor scores for each dimension were saved so these further analyses could be conducted.

**Reliability Analysis.** The internal consistency of the identified trust dimensions was tested by computing Cronbach's alpha upon the variables in each dimension. Cronbach's alpha provides a consistent assessment of reliability without having to retest individual respondents, and is a common measure of the reliability of the dimension.

For the eight items in the shared norms and values dimension, the corrected item-total correlations ranged from about 0.5 to about 0.7, indicating satisfactory correlations between each item and the dimension as a whole. Cronbach's alpha was 0.88, with reductions if any of the variables are removed. This dimension is therefore found to be a consistent and reliable measure using the previously identified items.

For the five items composing the contingent consent dimension, the corrected item-total correlations ranged from about 0.6 to about 0.7, indicating that each item was strongly related to the dimension. Cronbach's alpha was .84, with reductions if variables were deleted. Thus, all five items are retained for a reliable measure of contingent consent.

The seven items in the perceived knowability dimension had corrected item-total correlations which ranged from about 0.6 to about 0.8, again indicating strong relationships between the items and the dimension as a whole. Cronbach's alpha was 0.88, with reductions upon the deletion of any of the items. We conclude that this dimension is also found to be a reliable measure with these seven items.

#### *Cluster Analysis.*

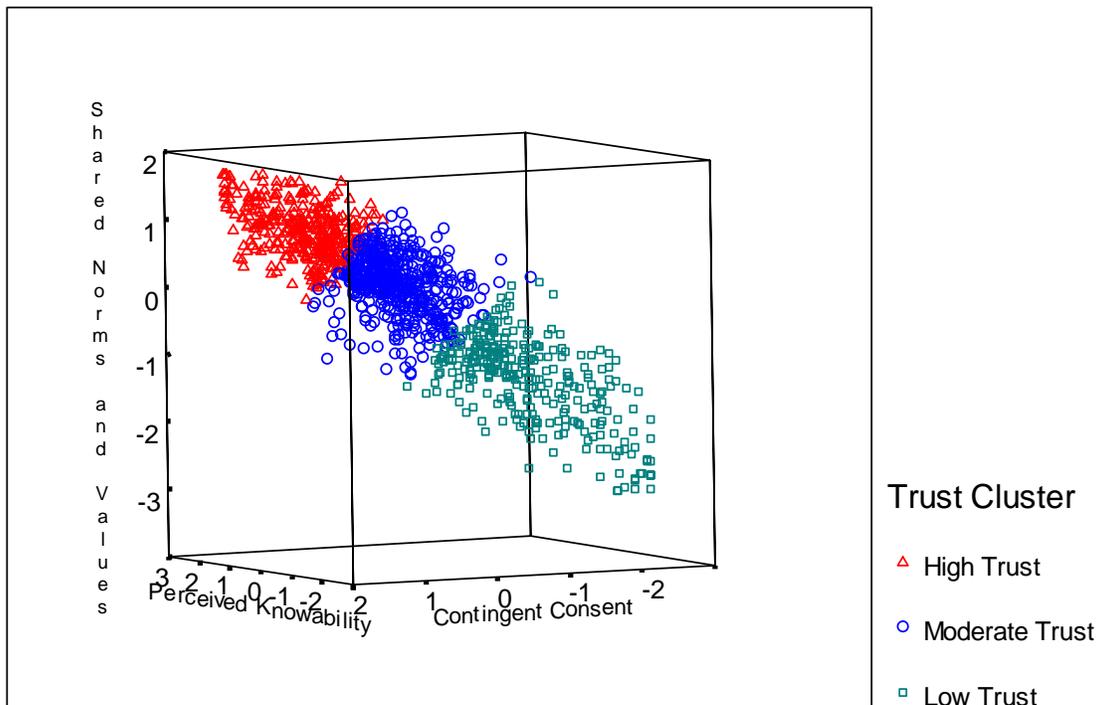
A K-Means cluster analysis was conducted on the three trust dimension factor scores in order to separate respondents into groups with similar levels of trust. A three-cluster solution with individually distinguishable clusters when plotted and similar cluster sizes was chosen as the best fit to the data. Thus, the data were divided into groups of high trusting respondents, moderately trusting respondents, and low trusting respondents. Increases or decreases in number of clusters resulted in similar proportions of trusting versus distrusting respondents, with negligible discrimination between groups and uneven cluster sizes. Factor score centers

for each of the clusters are shown in table 10. It can be seen that the high trust cluster has data points that are high on all three dimensions, and that the low trust cluster is low on all three dimensions of trust. The moderate trust cluster is in between. A 3-dimensional scatter plot of factor scores plotted against one another is shown in Graph 1. In the graph, it can be seen that a distinct gap exists between medium and low trust clusters, and that there is no overlap between high and medium trust clusters, indicating satisfactory distinction between clusters.

**Table 10:** Cluster center location for trust factor scores

	High Trust	Moderate Trust	Low Trust	Total
Factor score for shared norms and values	0.90372	0.13168	-1.20071	
Factor score for contingent consent	0.92401	0.06752	-1.14702	
Factor score for perceived knowability	0.96147	0.09796	-1.21814	
Number of cases	362	483	304	1149

**Figure 2:** Trust Dimension Factor Scores



*Analysis By Trust Cluster.*

The following tables are the result of the crosstabulation of trust clusters with independent variables. This allows comparison of the different trust clusters on socio-economic variables, level of experience with forest fire, opinions towards the Bitterroot National Forest, and so forth. In doing so, identifying characteristics of those Ravalli County residents who do or do not trust the Bitterroot National Forest can be found. Unless indicated, all differences were statistically significant at  $p \geq 0.05$ . Table 11 shows the description of clusters for sociodemographic information. Full analyses of trust clusters are reported in Appendix C.

**TABLE 11: Demographic and geographic characteristics of trust clusters**

Item	Cluster		
	Low Trust	Moderate Trust	High Trust
Age <sup>o</sup>	-	-	-
Sex	More men	Equal split	More women
Education <sup>o</sup>	-	-	-
Income <sup>o</sup>	-	-	-
Years in Montana	m = 31.59 <sup>a,b</sup>	m = 25.02 <sup>a</sup>	m = 24.10 <sup>b</sup>
Years in Ravalli County	m = 24.96 <sup>a,b</sup>	m = 17.70 <sup>a</sup>	m = 17.03 <sup>b</sup>
Town	Victor Hamilton <sup>o</sup> Alta Darby/Sula	Hamilton <sup>o</sup>	Stevensville Hamilton <sup>o</sup>
Region	Central South	North <sup>o</sup>	North <sup>o</sup>

<sup>o</sup>Not statistically different at  $\alpha = .05$ ; <sup>a,b</sup>Means significantly different at  $\alpha = .05$

The following table, Table 12, shows the cluster configuration for questions dealing with general characteristics of the three clusters in regards to fire experience. Variables dealing

with the location of respondents' primary residence, as well as their membership in organizations with interests in the management of the Bitterroot National Forest were not found to be statistically different between the clusters<sup>5</sup>.

**Table 12:** Geographic and other characteristics of trust level clusters

Item	Low Trust more likely to...	Moderate Trust more likely to...	High Trust more likely to...
Residence location relative to town*	Live In town	Live on the edge of town <sup>a</sup>	Live Outside of town <sup>a</sup>
Residence relative to urban/wildland interface	Live in a forested area or Live on the edge of a forested area	Equal split	Live outside a forested area
Distance from BNF boundary*	Within 1/2 mile <sup>a</sup>	Within 1/2 mile <sup>a</sup>	Beyond 1/2 mile
Member of a group with interests in BNF management <sup>b</sup> Works for USFS	Work for USFS	Not work for USFS	
Affected by smoke	Very	Somewhat <sup>a</sup>	Not at all <sup>a</sup>

\* Significant at 0.10; <sup>a</sup> Means significantly different at  $\alpha = .05$ ; <sup>b</sup> Not significantly different

The following table, Table 13, shows the characteristics of the clusters for respondents experience with evacuation during fires, as well as how their income was affected by fires in the Bitterroot. The variable “summative evacuation experience” was created to generalize respondents’ overall experience with evacuation by counting each affirmative response to the 3 evacuation questions as a 1, and summing them together. This created a 4 point scale ranging

<sup>5</sup> The reason for the discrepancy between respondents’ residence location relative to town and relative to the wildland/urban interface is not currently known, but may be attributable to differences in respondents’ perceptions of what constitutes “in town,” “on the edge of town,” “outside of town,” “in a forested area,” “on the edge of a forested area,” and “outside of a forested area.” Additionally, given the rural agricultural nature of the region, simply living outside of town does not automatically mean someone lives in a forested area. An investigation into the accuracy of responses is currently being conducted by the University of Montana’s Bureau of Business and Economic Research and College of Forestry and Conservation.

from 0 (no evacuation experience) to 3 (high evacuation experience). A similar approach was taken with “summative effect of fire on income.” Affirmative responses to each of the four questions dealing with the effect of fire on respondents’ income were scored as a 1, and the variable was created by summing the responses to each question. Thus, a five point scale was created that ranged from 0 (no effect of fire on income) to 4 (strong effect of fire on income). Respondents in the low trust group were more likely to have had at least some social and economic impact from fire, while those in the moderate or high trust groups tended to have had little to no social or economic impact from forest fires.

**Table 13:** Trust level groups' experience with the social and economic effects of forest fires.

Item	Low Trust more likely to...	Moderate Trust more likely to...	High Trust more likely to...
Told to evacuate	Be Told to evacuate	Equal split	Not Told
Told to prepare to evacuate, but not required? <sup>a</sup>	-	-	-
Required to evacuate, but refused	Required, refused	Not required	Not required
Summative Evacuation Experience	Moderate High	Some	None
Lost hours at work	Lost hours	Equal split	Didn't lose hours
Worked more hours <sup>a</sup>	-	-	-
Business/ employer lost money	Lost money		Didn't lose money
Business/ employer made more money <sup>a</sup>	-	-	-
Summative effect of fire on income	Moderate effect Minimal effect Some effect	Equal split - -	No effect - -
Worked in a job that helped to fight fires in the Bitterroot	Worked to help fight fires	Didn't work to help fight fires <sup>a</sup>	Didn't work to help fight fires <sup>a</sup>

<sup>a</sup> Responses were not significantly different among trust groups at  $\alpha = .05$

In order to gauge the general cynicism of respondents, three questions were asked to measure respondents' attitudes about other people. The questions were binary in nature and required respondents to choose one of two possible responses. Many respondents found these options to be restrictive and volunteered a response of "depends." The results are shown in table 14.

**Table 14:** Trust Level Grouping Based on General Cynicism of Respondents

Item	Low Trust more likely to...	Moderate Trust more likely to...	High Trust more likely to...
Most of the time people try to be helpful/mostly look out for themselves	Look out for themselves	*Depends (6.6%)	Try to be helpful
Most people would try to take advantage/would try to be fair	Take advantage	*Depends (9.2%)	Try to be fair
Most people can be trusted/you can't be too careful in dealing with people	Can't be too careful	*Depends (8.4%) <sup>a</sup>	Most people can be trusted Depends* <sup>a</sup>

\* Volunteered. Numbers in parenthesis refer to percent of volunteered responses for each question

<sup>a</sup>Not statistically different among trust groups at  $\alpha = .05$

This analysis provides evidence of the validity of our trust measures, since those that tended to be most cynical were in the low trust group. Conversely, those that tended to be least cynical were in the high trust group. Those that took the middle path tended to be in the moderate trust group.

Several questions were asked about respondents' opinions of the general management of the Bitterroot National Forest. The following table, Table 15, shows the cluster distribution for variables measuring opinions of the general management of the Bitterroot National Forest. These results also indicate the validity of our measurement of trust since levels of satisfaction

with and confidence in the Bitterroot National Forest and its managers are lower in the low trust groups.

**Table 15:** Trust level groups’ opinions about BNF general management

Item	Low Trust more likely to be...	Moderate Trust more likely to be...	High Trust more likely to be...
How satisfied are you with the overall management of the BNF	Very Dissatisfied Somewhat dissatisfied	Somewhat satisfied	Very Satisfied
In the past. How pleased have you been with the way the BNF in general was managed?	Very Displeased Somewhat Displeased	Somewhat pleased	Very Pleased
How much confidence do you have in BNF managers in general?	No confidence at all Not very much	Quite a lot <sup>a</sup>	Quite a lot <sup>a</sup> Complete confidence
To what extent does the BNF share your values about managing the forest?	Not at all		Completely

<sup>a</sup>Not statistically different among trust groups at  $\alpha = .05$

Five questions were included that address respondents’ general attitudes towards the US Forest Service. These questions were based on the work of Winter, Palucki, and Burkhardt (1999). Tables 16a-e show trust cluster distribution for five statements addressing respondents’ attitudes towards the Forest Service in general. Statements were read to respondents, who then rated their level of agreement with the statement on a scale of one to five, where one indicated complete disagreement and five indicated complete agreement (anchors are shown in tables). Respondents from the low trust group tended to respond with lower values (indicating higher disagreement with the statements), while respondents from moderate and high trust groups tended to respond with higher values (indicating greater agreement with the statements). Members of the low trust group always had a higher percentage of responses in the complete

disagreement category (1), while members of the high trust group always had a higher percentage of moderate agreement responses (3 or 4). The high trust group never had a higher proportion of responses in the complete agreement category (5). Numbers in bold indicate the highest percentage for each trust group.

**Table 16a:** The US Forest Service Supports My Views

	Opposes my views					Supports my views	
	1	2	3	4	5	Total	
Low Trust Group	<b>47.4%</b>	29.7%	16.4%	3.4%	3.1%	100.0%	
Moderate Trust Group	7.7%	23.1%	<b>45.6%</b>	20.9%	2.7%	100.0%	
High Trust Group	2.5%	4.3%	31.3%	<b>43.0%</b>	18.9%	100.0%	
Total	17.1%	19.2%	33.1%	22.8%	7.8%	100.0%	

**Table 16b:** The US Forest Service Has Similar Goals To Mine

	Different goals					Similar goals	
	1	2	3	4	5	Total	
Low Trust Group	<b>45.7%</b>	31.3%	15.5%	5.2%	2.4%	100.0%	
Moderate Trust Group	8.2%	25.1%	<b>40.3%</b>	22.3%	4.1%	100.0%	
High Trust Group	2.4%	7.0%	26.8%	<b>39.9%</b>	23.8%	100.0%	
Total	16.7%	21.2%	29.3%	23.1%	9.7%	100.0%	

**Table 16c:** The US Forest Service Thinks Like Me

	Does not think like me					Thinks like me	
	1	2	3	4	5	Total	
Low Trust Group	<b>65.5%</b>	21.0%	9.3%	2.4%	1.7%	100.0%	
Moderate Trust Group	22.4%	28.6%	<b>36.6%</b>	10.1%	2.3%	100.0%	
High Trust Group	8.3%	12.4%	<b>36.2%</b>	33.0%	10.2%	100.0%	
Total	30.1%	21.6%	28.9%	14.9%	4.5%	100.0%	

**Table 16d:** The US Forest Service Shares My Values

	Does not share my values					Shares my values	
	1	2	3	4	5	Total	
Low Trust Group	<b>52.3%</b>	27.7%	13.7%	4.2%	2.1%	100.0%	
Moderate Trust Group	11.5%	27.3%	<b>36.7%</b>	19.6%	4.8%	100.0%	
High Trust Group	2.1%	10.0%	28.7%	<b>36.3%</b>	23.0%	100.0%	
Total	19.6%	21.9%	27.9%	20.7%	9.8%	100.0%	

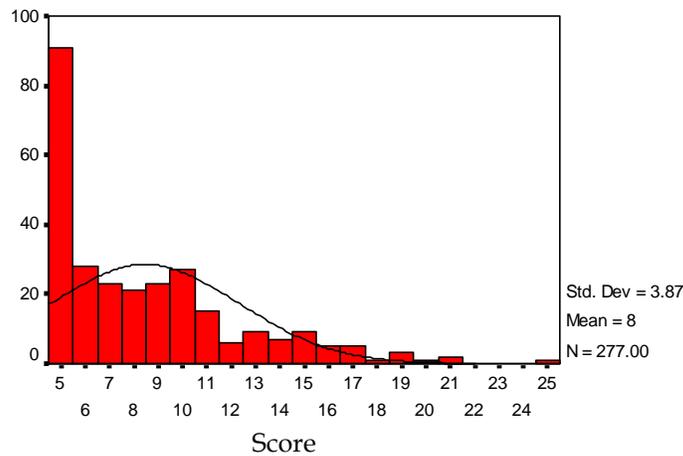
**Table 16e:** The US Forest Service Is Like Me

	Is not like me	←—————→			Is like me	Total
	1	2	3	4	5	
Low Trust Group	<b>70.9%</b>	18.6%	6.0%	1.4%	3.2%	100.0%
Moderate Trust Group	27.6%	28.3%	<b>32.3%</b>	10.0%	1.9%	100.0%
High Trust Group	10.9%	14.5%	<b>36.0%</b>	26.7%	11.9%	100.0%
Total	34.8%	21.4%	26.0%	12.6%	5.3%	100.0%

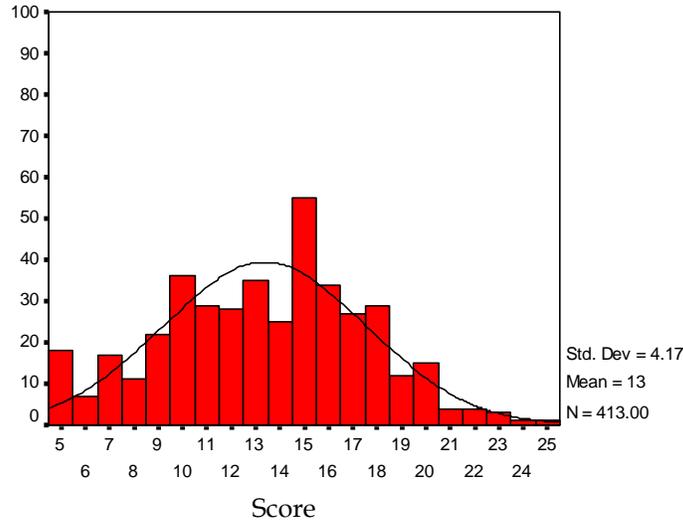
An additive scale of these items was created by summing all five of the five-point scales resulting in a 20 point scale that ranged from 5 (low agreement) to 25 (high agreement).

Histograms for the additive trust measure for each trust group are shown on Figure 3a-c. The solid line across the histograms approximate normal distributional curves, indicating relational normality of scale response.

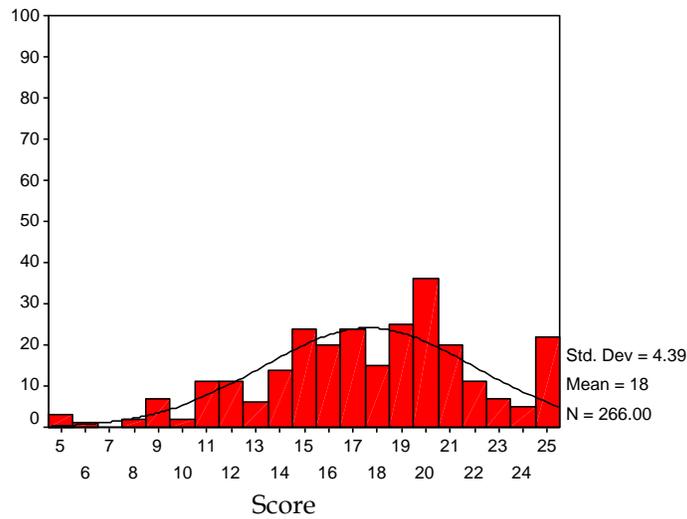
**Figure 3a:** USFS Additive Trust Measure, Low Trust Group Histograms



**Figure 3b:**USFS Additive Trust Measure, Moderate Trust Group Histogram



**Figure 3c:** USFS Additive Trust Measure, High Trust Group Histogram



Tables 17 a-b, show respondents' general attitudes about the US government. Question items were first used by Miller (1974).

**Table 17a:** The Federal Government Wastes A Lot/Some/Not Much Money

	Doesn't waste much money	Wastes some money	Wastes a lot of money	Total
Low Trust	1.0%	10.3%	88.7%	100.0%
Moderate Trust	1.4%	19.6%	78.9%	100.0%
High Trust	4.6%	35.5%	59.9%	100.0%
Total	2.2%	21.7%	76.0%	100.0%

**Table 17b:** The Amount Of Time You Can Trust The Government In Washington To Do What Is Right

	None of the time		←————→			All of the time	
	1	2	3	4	5	Total	
Low Trust Group	<b>36.6%</b>	<sup>a</sup> 34.2%	23.1%	3.7%	2.4%	100.0%	
Moderate Trust Group	20.5%	<sup>a</sup> <b>34.6%</b>	34.0%	8.9%	2.1%	100.0%	
High Trust Group	15.2%	23.6%	<b>40.9%</b>	15.8%	4.5%	100.0%	
Total	23.2%	31.2%	33.1%	9.6%	2.9%	100.0%	

<sup>a</sup>Not statistically different among trust groups at  $\alpha = .05$

All trust groups believed that the Federal government wastes a lot of money. However, as the groups' level of trust increased, the percent of respondents that believed the government wasted a lot of money decreased, while the percent of those that believed the government wastes some money increased. On a five-point scale, with one representing being able to trust the federal government to do what is right none of the time, and five representing all of the time, the majority in the low trust group responded with a 1 or a 2, while a plurality of high trust group members responded with a 3. No trust group had a plurality that responded with a 4 or 5.

*Summary of characteristics of trust clusters.*

In general, those in the low trust cluster were more likely to be male, have lived in Montana for around 32 years and in Ravalli County for about 25 years, and live in the southern portion or Ravalli County. They tend to live in or on the edge of a forested area, have worked for the US Forest Service, and have been very affected by smoke from fires in the Bitterroot. They are likely to have previously been told to evacuate and may have refused. Their business or employer likely lost money because of fires in Bitterroot Valley, and they themselves are likely to have worked in a job that helped to fight fires in the Bitterroot Valley. Low trusters are more likely to believe that people have too look out for themselves, that most

people would try to take advantage of others, and that one can't be too careful in dealing with people. They tend to be very dissatisfied with the overall management of the Bitterroot National Forest, and have been either very or somewhat displeased with how the Bitterroot National Forest was managed in the past. They tend to have either little or no confidence in the Bitterroot National Forest's general management, and believe that the Bitterroot National Forest does not share their values about managing the forest. They generally do not find themselves to be in agreement with the actions of the US Forest Service in general, believe that the Federal Government wastes a lot of money, and that the Federal Government cannot be trusted to do what is right most of the time.

Members of the high trust group were more likely to be female, have lived in Montana for about 24 years, in Ravalli County for about 17 years, and reside in the northern portion of Ravalli County. They tend to live outside a forested area, and neither a member of their household nor themselves have tended to work for the US Forest Service, and they have tended not to have been affected by smoke from fires in the Bitterroot. High trusters are likely to have never been told to evacuate, their employer or business did not lose money because of Bitterroot Fires, and neither they themselves, nor one of their family members have tended to work for the US Forest Service. They are more likely to believe that people try to be helpful and fair, and that most people can be trusted. They tend to be very satisfied with the overall management of the Bitterroot National Forest, have been very pleased with how it has been managed in the past, and have either quite a lot or complete confidence in Bitterroot National Forest Managers in general. They also tend to believe that the Bitterroot National Forest completely shares their values about managing the forest. They tend to be in agreement with the actions of the US Forest Service in general, and believe that the Federal government only

wastes some, or doesn't waste much money, and that the Federal Government can be trusted to do what is right some, most, or all of the time.

## Discussion

### *Comparison with known data*

Using the 2000 US Census as a baseline, this study reflected the sociodemographic composition of Ravalli County fairly closely. The only notable discrepancies were in education, where this survey appears to have under-sampled those with less than a high school diploma by about 7%, over-sampled those with only a high school diploma or GED by about 10%, and under-sampled those with only some college by about 9%.

Survey questions about respondents' experience with fire which were asked in both this study and the 2000 post fire assessment differed little between the surveys. The only exceptions were that compared with this survey, in 2000 about 6% more respondents said that they have lost hours at work because of fires in the Bitterroot than those in this study, and about 4.5% more respondents in 2000 said that they worked more hours because of fires in the Bitterroot.

### *Segmentation*

Because low levels of trust are thought to negatively affect the acceptability of actions by organizations or individuals (Putnam, 1995), residents of the Bitterroot Valley with low levels of trust in the Bitterroot National Forest to manage forest fuels and fires are more likely to raise concern with, or be opposed to management actions. Thus, discussion will focus most on this segment of the population.

For some attitudes towards the Bitterroot National Forest, it is quite difficult – and sometimes impossible – to have an effect on some respondents' attitudes; for example,

whether or not respondents are proud of how fires are managed on the Bitterroot, or how pleased they are with how fires have been managed in the past. Attitudes such these can only be affected over longer periods of time, though concerted organizational stability, honesty, and transparency (Thomas, 1998).

Other attitudes, however, can be more easily affected over shorter periods of time. These attitudes can be broken into two categories: those related to the perceived abilities of fire managers on the Bitterroot National Forest, and those related to the relationships between fire managers and the public. For the former category, in order to increase trust among the low trust group, it is important for fire managers to focus on fostering confidence, competence, effectiveness, and reliability (Thomas, 1998). All four of these items are interrelated and must be managed for simultaneously in order to help increase the low trust group's trust in the fire and fuel management of the Bitterroot National Forest. Respondents distinguished strongly between the competence of fire *managers*, and the competence of fire *fighters*, responding that they had quite a lot of confidence in the latter, but not very much confidence in fire managers. In order to change this, it must be ensured that the best possible management decisions are successfully implemented, and result in the desired fire or fuel management effect time after time.

In order to increase the low-trust group's trust in Bitterroot National Forest fire managers, it is important to ensure that managers pay attention to what the public thinks, that they tell the truth, and manage fire and fuels fairly. Like the perceived ability of fire managers, the relationship between fire managers and the public also needs to be looked at holistically. Managers need to ensure that people are listened to and acknowledged, and that they act with integrity and procedural justice.

There is some indication that managers do meet some of the low-trust group's needs in these categories. Low-trust group respondents tended to somewhat agree that Bitterroot National Forest Fire managers demonstrated a general attitude of compassion when fighting fires, and that also respond to meet the need of local residents. But in order to increase trust further, additional work must be focused in each of the categories.

### *Implications for Public Involvement*

For the purpose of the landscape level fuel treatment project current being developed in the Darby District of the Bitterroot National Forest, public involvement will be a key element in obtaining community support. While the earlier 2000 post-fire assessment suggested some community members lacked trust in the agency's ability to accomplish this kind of project in a way that considered the meanings local people attach to these places, now more accurate understanding exists of the extent of this lack of trust. Across the Bitterroot Valley, this study suggests about 32% of the population fits this description (low trust). But now, we also understand that many of the characteristics associated with this group are outside of the ability of National Forest managers to affect. The demographics, past work history and history of being influenced by previous fires may only change with time. The agency, however, does have the ability to search for common ground and better understand the values local people place on areas considered for landscape level modification.

Recent and current research can be helpful in at least two ways. First, the BEMRP social science team will work to develop a useable assessment tool to measure the basic trust dimensions applied to this specific fuel treatment project. While past research has suggested that those people most involved with the political and social life of a community are the most

trusting, this study found low-trust members of the Bitterroot Valley more likely to live in the community most adjacent to this fuel treatment project. We have no idea, but need to know, how the distribution of those participating in public involvement, across the high-, moderate-, and low-trust groups compares to that of the general population. This assessment would also serve as a baseline measure, with options to compare distributions of pre-public involvement participants with distributions at the time a preferred alternative is selected, and at the time the decision is actually implemented.

Second, recent social science research in the Bitterroot Valley has been aimed at testing methods to describe and map the meanings residents attach to the Bitterroot Front landscape. At the broad, Bitterroot Front level, it was learned that residents attach meanings to places they go and to places they do not go. They also attach meanings sometimes to the specific site and sometimes to major drainages, lake basins or to other more broad aspects of the landscape. Some meanings are very functional, related to personal enjoyment they receive from going there or traditional or work related purposes, and others are more appreciative of natural conditions, healthy animal populations, or watershed protection. An important part of the public involvement process, in order to contribute to higher trust in the agency's ability to make decisions that consider these local values, is to present and discuss this recent research with these community members. Additionally, continued effort is needed to obtain more site-specific understanding of the relationship between those participating in the public involvement and areas being considered for fuel treatments. Greater effort must also be made to more accurately understand how alternative fuel treatment techniques, from the use of wildland fire to the mechanical treatment of various intensities, will influence these relationships. Currently, continued collaboration between research and management is

planned to incorporate these research projects into efforts to make fuel management decisions in the Bitterroot responsive to both national policy on reduction of fuel hazards and local interest in accomplishment of fuel hazard reduction treatments in ways that are more sensitive to, and even protective of, the meanings local communities attach to these public land resources

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## **Appendix A: Survey Instrument**

## INTRODUCTION

**Hello, my name is [INSERT YOUR FIRST AND LASTNAME].  
I'm calling from The University of Montana (here) in Missoula. We're doing a survey to find out what residents of Ravalli County think about forest fire management in the Bitterroot National Forest on behalf of researchers at the University of Montana.**

**First, though, I need to be sure I have dialed the right number. Is this 999-9999?**

**In order to do the survey, I have to follow a specific selection procedure. For this survey only people aged 18 and older are to be interviewed. So of all the people living in your household, including yourself, how many are 18 years of age and older? ENTER NUMBER**

**And how many of these persons are female? ENTER NUMBER**

**According to the selection procedure, I need to interview \_\_\_\_\_. Is he/she available? Or is that you?**

**READ THE FOLLOWING CONFIDENTIALITY STATEMENT TO ALL RESPONDENTS:**

**Before we start, I want to assure you that this interview is completely confidential and voluntary. If we should come to a question you don't want to answer; just let me know and we'll go on to the next question. This interview should take about 12 minutes.**

**I1. How old were you on your last birthday?**

Years \_\_\_\_\_

**IF UNDER THE AGE OF 18 TERMINATE THE INTERVIEW.**

PERSONAL EXPERIENCE WITH FIRE IN THE BITTERROOT

The first group of questions asks about how you, personally, have been affected by fires in the Bitterroot.

A1. How much have you, personally, been affected by smoke from fires in the Bitterroot? Would you say you were not at all affected, somewhat affected, or very affected by smoke from fires in the Bitterroot?

Very	3
Somewhat	2
Not at all	1
DK	8

A2. During fires in the Bitterroot, have you, personally ever been:

	Yes	No	DK
a. Evacuated from your home	1	0	8
b. Told to prepare to evacuate, but not required to	1	0	8
c. Told to evacuate but chose not to	1	0	8

A3. Some people have lost work hours or found that their businesses lost money due to fires in the Bitterroot. Other people worked more hours or found that their businesses were busier. Which of the following has ever applied to you, personally, as a result of fires in the Bitterroot?

	Yes	No	DK
a. I lost hours at work	1	0	8
b. I worked more hours	1	0	8
c. My business or employer lost money	1	0	8
d. My business or employer made more money than usual	1	0	8

**A4. Have you, yourself, ever worked in a job that helped to fight fires in the Bitterroot? Examples of these jobs include working on a fire crew, fire camp support staff, local law enforcement, or local emergency services.**

Yes	1
No	0
DK	8

#### FIRE MANAGEMENT IN THE BNF

**The next group of questions asks about fire management in the Bitterroot National Forest.**

**C1. Generally speaking how satisfied are you, if at all, with the way the Bitterroot National Forest staff deals with fires?**

Very satisfied	4
Somewhat satisfied	3
Somewhat dissatisfied	2
Very dissatisfied	1
DK	8

**C2. Generally speaking how satisfied are you, if at all, with the way the Bitterroot National Forest staff deals with forest fuels? IF NECESSARY, FOREST FUELS ARE LIVING OR DEAD PLANTS THAT ARE FOUND IN WOODED AREAS.**

Very satisfied	4
Somewhat satisfied	3
Somewhat dissatisfied	2
Very dissatisfied	1
DK	8

**C3. Considering that the Bitterroot National Forest is managed on behalf of everyone, how satisfied are you, if at all, with fire management in the Bitterroot National Forest?**

Very satisfied	4
Somewhat satisfied	3
Somewhat dissatisfied	2
Very dissatisfied	1
DK	8

**C4. In the past how pleased, if at all, have you been with the way fires in the Bitterroot National Forest were managed?**

Very pleased	4
Somewhat pleased	3
Somewhat displeased	2
Very displeased	1
DK	8

**C5. How much, if any, confidence do you have in wildland fire fighters in general? Do you have?**

Complete confidence	4
Quite a lot of confidence	3
Not very much confidence	2
No confidence at all	1
DK (9)	8

**C6. What about fire managers in the Bitterroot National Forest? Do you have? IF NECESSARY, FIRE MANAGERS ARE TRAINED SPECIALISTS ENGAGED IN FIRE MANAGEMENT. EXAMPLES INCLUDE: STATE OR FEDERAL FIRE SPECIALISTS, INCIDENT COMMAND TEAMS, OR FOREST PLANNERS.**

Complete confidence	4
Quite a lot of confidence	3
Not very much confidence	2
No confidence at all	1
DK	8

**C7. Based on your observations and experiences what portion, if any, of the people who manage forest fires in the Bitterroot National Forest know what they are doing?**

All	4
Most	3
Less than half	2
None	1
DK	8

**C8. In your community, how would you rate the effectiveness of Bitterroot National Forest fire managers in dealing with fire-related issues?**

Excellent	4
Good	3
Fair	2
Poor	1
DK	8

**C9. How sure, if at all, have you felt that forest fires threatening your community or your property would be put out in time?**

Very sure	4
Somewhat sure	3
Somewhat unsure	2
Very unsure	1
DK	8

**C10. How much attention, if any, have Bitterroot National Forest managers paid to what people think when managers decide what to do about forest fires?**

A good deal of attention	3
Some attention	2
Not much attention	1
DK	8

**C11. When managers of the Bitterroot National Forest speak on television, radio, in newspapers, or at public meetings about forest fires, how often, if at all, do they tell the truth?**

Always	4
Mostly	3
Less than half of the time	2
Never	1
DK	8

For each of the following phrases please tell us to what extent you agree or disagree.

**C12. I find the Bitterroot National Forest staff to be reliable when managing fires.**

Strongly agree	4
Somewhat agree	3
Somewhat disagree	2
Strongly disagree	1
DK	8

**C13. I find the Bitterroot National Forest staff to be reliable when managing forest fuels. IF NECESSARY, FOREST FUELS ARE LIVING OR DEAD PLANTS THAT ARE FOUND IN WOODED AREAS.**

Strongly agree	4
Somewhat agree	3
Somewhat disagree	2
Strongly disagree	1
DK	8

**C14. Residents of the Bitterroot Valley say that the Bitterroot National Forest staff is trustworthy when fighting fires.**

Strongly agree	4
Somewhat agree	3
Somewhat disagree	2
Strongly disagree	1
DK	8

**C15. I believe the Bitterroot National Forest staff demonstrates a general attitude of compassion when fighting fires.**

Strongly agree	4
Somewhat agree	3
Somewhat disagree	2
Strongly disagree	1
DK	8

**C16. Managers on the Bitterroot National Forest respond to the needs of local residents when fighting fires.**

Strongly agree	4
Somewhat agree	3
Somewhat disagree	2
Strongly disagree	1
DK	8

**C17. When fighting fires, do you think that the Bitterroot National Forest staff generally:**

Wastes a lot of the money	3
Wastes some money	2
Doesn't waste very much money	1
DK	8

**C18. Would you say that you are proud of the way fire is managed on the Bitterroot National Forest, or that you can't find too many things about the fire management to be proud of? IF NECESSARY, PRIDE IN A FOOTBALL TEAM OR PRIDE IN ONE'S COUNTRY.**

Proud of fire management	1
Can't find much too many things	0
DK	8

**C19. How often, if at all, do you think fires on the Bitterroot National Forest are managed according to a fair process?**

Always	4
Mostly	3
Less than half of the time	2
Never	1
DK	8

**C20. To what extent, if at all, does the Bitterroot National Forest share your values about fire management? Please rate the extent to which the Bitterroot National Forest shares your values on a scale from one to five where one is not at all and five is completely.**

Completely	5
	4
	3
	2
Not at all	1
DK	8

**C21. To what extent, if at all, do you agree or disagree with the following statement: Science can settle differences of opinion about the risks and benefits from forest fires?**

Strongly agree	4
Somewhat agree	3
Somewhat disagree	2
Strongly disagree	1
DK	8

## GENERAL MANAGEMENT OF THE BITTERROOT NATIONAL FOREST

The next section changes from asking about fire management to focusing on the Bitterroot National Forest's general management practices.

**D1. How satisfied are you, if at all, with the overall management of the Bitterroot National Forest?**

Very satisfied	4
Somewhat satisfied	3
Somewhat dissatisfied	2
Very dissatisfied	1
DK	8

**D2. In the past how pleased, if at all, have you been with the way the Bitterroot National Forest in general was managed?**

Very pleased	4
Somewhat pleased	3
Somewhat displeased	2
Very displeased	1
DK	8

**D3. How much, if any, confidence do you have in managers of the Bitterroot National forest in general? Do you have?**

Complete confidence	4
Quite a lot of confidence	3
Not very much confidence	2
No confidence at all	1
DK (9)	8

**D4. To what extent, if at all, does the Bitterroot National Forest share your values about managing the Bitterroot National Forest in general? Please rate the extent to which the Bitterroot National Forest shares your values on a scale from one to five where one is not at all and five is completely.**

Completely	5
	4
	3
	2
Not at all	1
DK	8

## GENERAL MANAGEMENT OF THE USDA FOREST SERVICE

The next group of questions asks about the USDA Forest Service and its general management practices.

Please rate each of the following phrases on a scale of 1 to 5, where five means the phrase represents what you believe and one means that the phrase does not. The USDA Forest Service:

### E1. Supports my views.

Supports my views	5
	4
	3
	2
Opposes my views	1
DK	8

### E2. Has similar goals to mine.

Has similar goals to mine	5
	4
	3
	2
Has different goals than mine	1
DK	8

### E3. Thinks like me.

Thinks like me	5
	4
	3
	2
Does not think like me	1
DK	8

**E4. Shares my values.**

Shares my values	5
	4
	3
	2
Does not share my values	1
DK	8

**E5. Is like me.**

Is like me	5
	4
	3
	2
Is not like me	1
DK	

**GENERAL MANAGEMENT OF THE FEDERAL GOVERNMENT**

**The next few questions ask about the general management of the Federal Government.**

**F1. Now what about the government in general? Do you think the federal government:**

Wastes a lot of the money	3
Wastes some money	2
Doesn't waste very much money	1
DK	8

**F2. How much of the time, if at all, do you think you can trust the government in Washington to do what is right? Please rate how much of the time on a scale from 1 to 5 where one is none of the time and five is all of the time.**

All of the time	5
	4
	3
	2
None of the time	1
DK	8

[General Trust]

## TRUSTWORTHINESS OF PEOPLE IN GENERAL

**For the next group of questions we are shifting focus from asking about the federal government to asking about the trustworthiness of people in general.**

**B1. Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?**

Try to be helpful	1
Just look out for themselves	0
DEPENDS	2
DK	8

**B2. Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?**

Would take advantage of you	1
Would try to be fair	0
DEPENDS	2
DK	8

**B3. Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?**

Most people can be trusted	1
Can't be too careful	0
OTHER, DEPENDS	2
DK	8

## DEMOGRAPHICS

**These last few questions are for classification purposes only.**

**G1. All together, how many years have you lived in Ravalli County?**

Years \_\_\_\_\_

**G2. Is this location in Ravalli County your primary residence?**

Yes 1  
No 0

**G3. All together, how many years have you lived in Montana?**

Years \_\_\_\_\_

**G4. What is the zip code of your primary residence?**

Zip Code \_\_\_\_\_

**G5. Do you live?**

In town	3
On the edge of town	2
Outside of town	1
DK	8

**G6. Is the place you live?**

In a forested area	3
On the edge of a forested area	2
Outside a forested area	1
DK	8

**G7. Do you live within one half mile of the boundary of the Bitterroot National Forest?**

READ ALL RESPONSE OPTIONS INCLUDING "NOT SURE."

Yes	1
No	0
Not sure	8

**G8. What is the highest degree or level of school you have completed?**

Grades 1-8 (elementary)	1
Grades 9-12 (some high school but no diploma)	2
Grade 12 or GED (high school graduate)	3
College 1 year to 4 years (Some college or technical school, but no degree)	4
College 1 to 4 years (Associate degree)	5
College 4 years or more (College graduate, BA, MB, JD, MD, PhD)	6

**G9. Which of the following categories best describes your total household income from all sources in the year 2003, before taxes and other deductions? This includes money from jobs, net income from business, farm or rent, pensions, dividends, interest, social security payments, and other money income received by members of this household who are 15 years of age or older. If you are self-employed or own your own business, please report your net income.**

100,000 dollars or more	1
Between 50,000 and 100,000 dollars	2
Between 50,000 and 75,000 dollars	3
Between 35,000 and 50,000 dollars	4
Between 20,000 and 35,000 dollars	5
Between 15,000 and 20,000 dollars	6
Between 10,000 and 15,000 dollars	7
Under 10,000 dollars	8
DK	98
Refused	99

**G10. Besides this phone number, do you have other telephone numbers in your household, such as fax or data lines, a children's or business line? Do not include cell phones.**

Yes	1 GO TO G11
No	0 SKIP TO G12
This phone number is not the respondent's	3 SKIP TO G12
DK	8 SKIP TO G12

**G11. How many of these telephone numbers are connected to phones that can be answered by a person?**

\_\_\_\_\_ \_\_\_\_\_  
RECORD EXACT NUMBER (RECORD "UNSURE/DK" AS 88)

**G12. Have you or other members of your household ever worked for the USDA Forest Service?**

Yes	1
No	0
Others in Household	2

**G13a. Could you tell me whether or not you are a member of an organization that has as one of its interests the management of the Bitterroot National Forest?**

Yes	1	Go to G13b
No	0	Skip to G14
DK	8	Skip to G14

**G13b. What is the name of that organization?**

**G14. Do you have any comments?**

**G15. That is all of the questions we have. Thank you very much for your assistance!**

**G16. After interview record respondent's gender**

0	Female
1	Male

## **Appendix B: Survey Results and Analysis**





## **Appendix C: Trust Group Crosstabulation**