

AN ABSTRACT OF THE THESIS OF

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Title: Building Social Capital through Community-Agency Collaboration:
A Survey of Residents in Northeast Washington

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Over the past half century, the USDA Forest Service has increasingly faced diverse and often competing demands for forest resources, ranging from recreation, to ecosystem services, and timber supply. Building positive community-agency relationships has become increasingly important. Such relationships can improve community support for forest planning and management activities, ultimately making the agency more efficient and effective, while also providing economic and social benefit to local communities. The development of social capital may play an important role in promoting positive agency-community relationships. Broadly defined, the term refers to the social networks between individuals and groups that create a willingness and ability to act collectively toward a common goal.

This study focuses on the impact that a partnership between the Colville National Forest and Northeast Washington Forestry Coalition has had on rural Northeast Washington communities. Overall, our study suggests the partnership has positively impacted networks among community members and networks between the community and the Forest Service. However, there is room for improvement. Many study participants were not familiar with important details about the Coalition's membership and objectives, or how its work may impact them or their community. Targeted outreach efforts will likely lead to greater support for the partnership. Such efforts could also strengthen networks among community members and community-agency networks as individuals learn how the partnership can benefit them and issues they care about.

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Building Social Capital through Community-Agency Collaboration:
A Survey of Residents in Northeast Washington

by
Carolin Maier

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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Carolin Maier, Author

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Building Social Capital through Community-Agency Collaboration: A survey of Residents in Northeast Washington

1. INTRODUCTION

Expectations about the role land management agencies should play in local communities have changed dramatically over the past half century. Traditionally, contributing to community stability by supplying a continuous flow of forest products was among the main objectives. Today, the USDA Forest Service faces increasingly diverse and often competing demands for forest resources, ranging from recreation, to ecosystem services, and timber supply. Addressing these issues requires communities to find compromise that satisfies multiple needs. The timber wars of the 1990s have shown that an all-or-nothing approach to even the most well-intended goals do not result in desirable outcomes (Frentz, Burns, & Sperry, 2000; Hansen, 2010; Troster, 2003). Addressing a variety of demands also requires agencies to build relationships with communities and include them in forest planning and decision-making processes. Positive community-agency relationships can increase community support for forest planning and management activities, ultimately making the agency more efficient and effective, while also resulting in economic and social benefit to local communities (Frentz et al., 2000; Troster, 2003).

Creating such relationships is often easier said than done. Research suggests that development of social capital may play an important role in promoting positive agency-community relationships (Frentz et al., 2000). Broadly defined, the term social capital refers to the social networks between individuals and groups that create a willingness and ability to act collectively toward a common goal. These networks are characterized by high levels of trust, which encourages individuals to act in the common interest because they trust others to reciprocate (norms of reciprocity) (Flint, Luloff, & Finley, 2008; Leahy & Anderson, 2010).

The social capital concept has been used to study collaborative partnerships between land management agencies and community groups (e.g. Leach & Sabatier, 2005; Leahy & Anderson, 2010; Wagner & Fernandez-Gimenez, 2009), while others have studied these relationships without explicitly referring to social capital (e.g. Curtis, Shindler, & Wright, 2002; Frenzt et al., 2000; Koontz et al., 2004). However, they all found that frequent interaction between managers and community members, as well as active inclusion in decision-making processes eventually led to higher levels of trust and stronger networks both among members of community groups and between community groups and agencies.

This study will focus on the impact that a partnership between the Colville National Forest and Northeast Washington Forestry Coalition (Coalition) has had on social capital development among community members in rural Northeast Washington (Figure 1). The Coalition is a community group consisting of individuals who represent both timber and environmental interests. It formed in 2002 and has since collaborated with the Forest Service on over two dozen forest management projects, primarily related to fuels management and restoration.

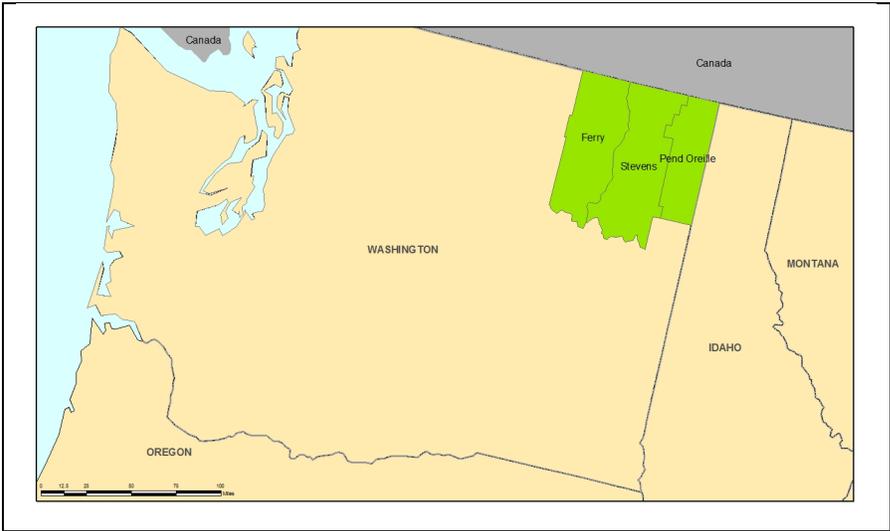


Figure 1 Map of study area

Based on qualitative interviews conducted between 2009 and 2011, it appears Coalition members and Forest Service personnel have built trusting relationships and strong networks among each other (Gordon, Mallon, Maier, Kruger, & Shindler, 2012). This study focuses on the impact the partnership has had on networks in surrounding communities. We used a mail-back survey to examine networks among community members, between community members and the Coalition, and between community members and the Forest Service. Networks are assessed using three dimensions of social capital, including communication, trust, and norms of reciprocity. Several questions about the public's perception of the Coalition and its partnership with the Forest Service were replicated from a survey conducted in 2004, enabling longitudinal comparisons. Findings will provide information to managers on the Colville National Forest and members of the Coalition about the public's perception of the partnership and its impact on networks within the community, and between the community and the Forest Service. We will use the findings to make suggestions about how the agency and the Coalition can further contribute to social capital development in Northeast Washington communities.

2. MANAGEMENT CONTEXT

Over the past two decades, Northeast Washington has experienced many of the same difficulties as other forest-dependent regions in the Western US. Changes in national forest policy and fluctuations in wood product markets have resulted in social and economic downturns (Frentz et al., 2000; Trosper, 2003). In 2000, a mill closure in the town of Republic devastated that community's economy. Local citizens largely blamed environmental groups for the shutdown. It was a turning point for communities in the region and ultimately led to formation of the Northeast Washington Forestry Coalition (Coalition). Environmental interests and the timber industry were united in the fear of experiencing the same fate as Republic, and the increasing frustration about the lack of progress on the Colville National Forest due to litigation and gridlock. Groups that once opposed each another recognized neither their respective goals, nor the overall well being of the community, were advancing under the present conditions.

Today, the Coalition represents both environmental interests and timber industry; most members are associated with either a conservation group or local timber-related businesses. Other entities, such as the U.S. Forest Service or the Confederated Tribes of the Colville Reservation have no official membership in the group. However, the Coalition actively encourages stakeholders to join the discussion at any time and maintains active working partnerships with many of them, in particular with the Colville National Forest (Gordon et al., 2012).

Issues related to forest planning and management activities are discussed at public, bi-monthly meetings between the Coalition and the Forest Service. These meetings benefit both the Forest Service and the constituents represented by the Coalition. While the Forest Service maintains final decision-making authority for projects, the meetings provide an opportunity for the Coalition to raise concerns early in the planning process. At the same time, the agency relies on the Coalition's input to gauge levels of support and concerns among key constituents within the community. Results of this partnership are also visible on the ground.

Since the partnership has been established, the Forest Service has been able to implement management projects without opposition from environmental groups.

The Coalition bases its level of support for individual forest management projects on guidelines spelled out in the so-called ‘Blueprint.’ The Blueprint is a document developed by the Coalition that divides the National Forest into three zones—an active management area, a restoration area, and a wilderness/roadless area. Each covers roughly one third of the Forest. Distinct management strategies have been identified by the Coalition as being appropriate for each zone (Headwater Economics, 2007; Northeast Washington Forestry Coalition & Forest Service, 2011).

The group has collaborated with the Forest Service on more than two-dozen forest management projects, including over 130,000 acres of commercial and pre-commercial thinning and prescribed burning without any litigation or appeals (Henneman, 2012; Northeast Washington Forestry Coalition & Forest Service, 2011). These projects have resulted in a substantial increase of annual harvest volumes and an estimated \$50 million in economic activity between 2004 and 2008 (Coyner, 2009). In addition to reducing the risk of wildfire and improving forest health, one of the most important achievements has been maintaining essential infrastructure. The region supports a robust forest products industry, including eight sawmills, one plywood plant, three pulp and paper plants, a cogeneration facility, and three pellet processing plants (Northeast Washington Forestry Coalition & Forest Service, 2011). These businesses are an important part of the local economy and by making forest management projects economically viable, play an essential role in restoring and maintaining healthy forests.

The partnership has not been without criticism. The broader community has criticized the Coalition for its narrow focus on active forest management. While Coalition members recognize that their mission is not all-encompassing, they believe their focus has allowed them to be more effective. Efforts to integrate and create permanent representation within the Coalition for other interests, such as recreation and ranching, have not been successful.

Another focal point of criticism is a proposed wilderness designation. From the very beginning, the environmental community represented in the Coalition has sought to expand the existing Salmo-Priest Wilderness and create new wilderness along the Kettle Crest Range. In return, the environmental community agreed to a near tripling of timber harvest in other areas of the Colville National Forest. The proposal has the support of the local timber industry; the increases in harvest levels in other parts of the forest are viewed as a fair trade-off. However, local ranchers and OHV users are opposed to the plan. Recreationists are concerned about limited trails and access to the Forest, despite provisions for new trails in other areas. Ranchers are concerned about the implications of a wilderness designation on grazing allotments on the National Forest (Conservation Northwest, 2009; Kramer, 2010; Welch, 2012). However, evidence suggests the negative consequences for both groups would be minimal (Fletcher, Hartzell, Coleman, Michalke, & Williamson Maurice, 2008).

3. LITERATURE REVIEW

The term social capital has been defined and operationalized differently by various disciplines and scholars (Bourdieu, 1986; Coleman, 1988; Putnam, 1995). Most researchers agree that social capital refers to social ties that allow people to act collectively for mutual advantage, and affect individuals' ability to access different resources (Field, 2003). It has been adopted most prominently by scholars of economics, sociology, and political science who use the concept to study problems of collective action in a variety of research fields (e.g. Grootaert & van Bastelaer, 2002; Woolcock, 2001), including democracy and governance, crime and violence, and natural resource management (e.g. Floress, Prokopy, & Allred, 2011; Leahy & Anderson, 2010; Woolcock, 2001). Researchers have argued for greater emphasis on social capital in natural resource management. Much of the existing research about social capital in natural resource management has been conducted in developing countries. Studies focusing on U.S. communities or land management agencies are more limited (Parisi, Taquino, Grice, & Gill, 2004). Because of its positive impact on collective action, scholars and policy makers have become increasingly interested in ways to build and enhance social capital. One way to do so is by building partnerships between governmental and non-governmental organizations, or for government agencies to include the public in their decision-making processes. However, quantifying social capital and relating changes in social capital to specific policies is very difficult, partly because many different approaches to measuring it have been introduced.

3.1 Social Capital

While there are competing definitions of social capital, most are built around three core concepts: social organizations and networks, community resources available for individual use, and positive or negative group externalities (Leahy & Anderson, 2010). First, scholars agree that social capital is defined by social networks and relationships between individuals, groups, or organizations. The

literature uses the terms ties, social capital, relationships, or networks interchangeably to describe these connections. Three types of networks are typically distinguished: bonding, bridging, and linking. *Bonding*, or exclusive, networks refer to relationships among relatively homogenous groups, such as family members and close friends. Because it binds together people from similar social situations, it can reinforce “exclusive identities and homogenous groups” (Field, 2003, p. 65; Putnam, 2000). *Bridging*, or inclusive, networks refer to relationships with distant friends, associates, and colleagues. They connect people of different backgrounds, generating broader networks. Putnam (2000) lists civil rights movements or ecumenical religious organizations as examples. According to Putman (2000), bridging social capital is necessary for ‘getting ahead,’ while bonding social capital is good for ‘getting by.’ *Linking* networks are similar to bridging networks, as they refer to relationships between individuals and groups of different social and economic status where power and wealth vary among group members. However, linking networks are characterized by the capacity to leverage resources, ideas, and information from beyond the community. These types of networks can thus be particularly important for community development policies or poverty-reduction strategies (Field, 2003; Harper, 2001; Woolcock, 2001).

Second, researchers agree that social capital is a community resource. It cannot be built individually or, as Woolcock (2001, p. 12) puts it, while human capital “resides in individuals, social capital resides in relationships.” However, it can be used by individuals for personal and/or community gains. Furthermore, social capital is not depleted, but can actually increase through use (Field, 2003; Grootaert & van Bastelaer, 2002); social capital and collective action are mutually reinforcing. As people work together, trust and norms of reciprocity may increase, making collaborative efforts more successful by increasing the chance that more people will join, ultimately building more social capital (Leach & Sabatier, 2005; Pretty & Ward, 2001).

Finally, most agree that social capital can be associated with positive and negative externalities. The literature tends to focus on the positive outcomes of social capital – broadly speaking achieving collective action. For example,

commonly owned land in a community with high social capital is less likely to be exploited by a single community member. Each individual trusts and expects the others to use the land in a way that is best for the community as a whole. Yet, social capital can also be associated with negative outcomes. While social networks can help groups or individuals achieve common goals, their success can directly or indirectly affect others negatively. Organized crime, such as the Italian mafia, is often used as an example. Close networks among criminals are essential to achieving the mafia's goals, yet their activities are harmful to outsiders. Social networks can also promote or reinforce inequalities because of unequally distributed access to different types of networks, which in turn provide access to different amounts of resources and different resource quality. Social networks that only provide benefits to members of a certain group, but negatively impact non-members are referred to as 'perverse social networks'; those that benefit both members and non-members are called 'productive social networks' (Field, 2003; Graeff, 2009).

3.2 Social Capital and Natural Resource Management

Much of the literature discusses the role of social capital in natural resource management in the context of developing countries. Scholars point to social capital as a way to address collective action dilemmas related to natural environments. Pretty and Ward (2001) found that in areas of low social capital natural resources are more likely subject to "overexploitation, poor upkeep, and physical degradation" (p.210). The positive link between high social capital and more sustainable natural resource management has also been well established. Collective decision-making and implementation of collective action is made easier by the existence of local networks and mutual trust. Social networks also reduce opportunistic behavior by individual community members. Social pressure and fear of exclusion provide incentives for individuals to act in ways that benefit the community as a whole (Grootaert & van Bastelaer, 2002). For example, improvements in soil conservation, crop yields, and pesticide use have been

mentioned as positive outcomes related to establishing resource-based citizen groups (Pretty & Ward, 2001; Sønderskov, 2009).

At the community level, social capital is often viewed as a mechanism to increase self-sufficiency by contributing to collaborative capacity and long-term sustainability. This is also why the concept is especially appealing to policy makers and development experts because of the mutually reinforcing relationship of social capital and collective action. As a result, once a high level of social capital is achieved, communities are more resilient, and less likely to depend on future intervention from governments or aid organizations (Leach & Sabatier, 2005; Magis, 2010; Pretty, 2003; Wagner & Fernandez-Gimenez, 2009).

Studies about the role of social capital in U.S. communities or land management agencies are more limited (Parisi et al., 2004). Leahy and Anderson (2010) examine the role federal resource management agencies might play in creating social capital by building and collaborating with a watershed association. They found that frequent communication and inclusive decision-making processes over time built trust and resulted in greater social capital among community members, as well as between citizens and agency personnel.

Leach and Sabatier (2005) researched the relationship between trust, social capital, and reaching agreement within watershed partnerships. They found that both trust and social capital are important for finding agreement within these partnerships. According to their study, trust is particularly important for reaching agreement within partnerships that are older than three years. Younger partnerships often overcome distrust by reaching agreement in crisis situations, such as flooding. They also found that trust and social capital indirectly impact a partnership's success at implementing restoration projects by helping them reach agreement. Finally, they reported that high levels of social capital and interpersonal trust can "inflate stakeholder's perception of the watershed partnership's impact on watershed conditions" (p.236).

Other studies have focused on community-agency collaboration in natural resource management without looking specifically at social capital. However, they point to the importance of the same relationship characteristics measured in social

capital assessments. These include trust building by maintaining communication between community members and agency personnel, and including the public in decision-making processes (Curtis et al., 2002; Frentz et al., 2000; Koontz et al., 2004; Leahy & Anderson, 2010). Research points to interactive forms of communication, such as conversations with agency personnel or field tours as the most effective outreach method to build relationships and trust between land management agencies and communities (Shindler & Gordon, 2005; Toman, Shindler, Absher, & McCaffrey, 2008).

3.3 Building Social Capital

Having recognized the potential role of social capital in different contexts, scholars and policy makers have become increasingly interested in ways to build and enhance social capital. However, there is debate among academics about whether or not policy intervention is desirable (Field, 2003; Lewis, 2010). Some have questioned the principle that community-mindedness and self-sufficiency can be created through public policy generally. Others have argued for or against policy interventions. The debate revolves mostly around the fact that efforts to build social capital may not always results in positive outcomes. Critics point to past efforts that have created perverse networks and left large groups of the population worse off than before, for example through the displacement of voluntary organizations by state initiatives. Others argue that social capital influences people's ability to access resources such as health and education benefits; governments are expected to regulate these areas (Field, 2003; Lowndes & Pratchett, 2005; OECD, 2001). If a government decides to intervene, it is faced with decisions regarding the kinds of measures that should be used and how results can be quantified.

3.3.1 Policy Measures to Build Social Capital

Education is one measure that is well supported empirically to contribute to social cooperation and participation. Individual policy measures vary widely and can range from active promotion of parenting classes to encouragement of mentoring programs for students. However, it is also known that much of the learning that is most relevant to the creation of social capital occurs through informal interaction outside formal institutions, limiting the extent to which social capital can be influenced by policy-makers (Field, 2003).

Another widely advocated approach entails building or encouraging partnerships between governmental and non-governmental organizations. This approach has been strongly encouraged by the World Bank and implemented in many eastern European countries, Great Britain, and Australia. Citizens tend to be more trusting of non-governmental organizations than governmental agencies; these organizations are thus often used to provide core services, especially to marginalized segments of society (Field, 2003). Such arrangements can help improve the government's effectiveness as long as citizens' needs are met. Otherwise, non-governmental organizations may eventually experience the same distrust as government agencies (Field, 2003; Huntoon, 2001; Lewis, 2010; Warner, 2001).

Another way the partnership approach has been used to create social capital is by actively involving communities in decision-making processes and project implementation. By focusing on a genuine, multi-party planning approach, local governments can increase opportunities for engagement and dialogue with individual citizens, or representatives of community groups (Field, 2003; Lewis, 2010). This approach is particularly relevant for natural resource management in the U.S. where legislation requires land management agencies to include the public in its decision-making processes.

3.4 Measuring Social Capital

Measuring social capital is a challenging task. The difficulties result largely from the lack of an agreed-upon definition of the term, the intangible nature of social capital, and the difficulty of associating specific outcomes to changes in levels of social capital. As a consequence, a great variety of indicators and measures have been developed to act as a proxy for social capital (Lowndes & Pratchett, 2005; OECD, 2001; van Deth, 2008). For example, the Organization for Economic Development and Cooperation (OECD) (2001) has in the past relied on trust as an indicator for social capital. While trust affects many of the social capital dimensions, in particular norms of reciprocity and communication, the OECD found it to be of limited value in measuring social networks. Critics argue that a multidimensional concept like social capital cannot be adequately measured using only one indicator (Stone & Hughes, 2002).

Most social capital assessments include several dimensions; each measured using a number of variables. The dimensions used typically relate to trust, norms of reciprocity, and networks. Trust reduces the transaction costs of working together and gives individuals the confidence to invest in group-activities, knowing that others will do so as well – norms of reciprocity. Networks can take different forms (bonding, bridging, linking) and may serve different purposes, including, for example, information and knowledge exchange, or leveraging of funds. Norms of reciprocity and networks also help ensure compliance with collectively desirable behavior (Harper, 2001; Lowndes & Pratchett, 2005; OECD, 2001; van Deth, 2008).

The individual indicators measuring each dimension can vary depending on the cultural context as well as the study's focus and scale (micro, meso, macro). The choice of indicators may also be impacted by the type of data available. A range of data sources have been used in the past, including national household surveys, case studies, and key informant interviews. Frequently, both quantitative and qualitative data are included. Measures of social capital have ranged from the number of local volunteer organizations, voter turnout, crime rates, to more latent concepts such as norms of reciprocity, trust in other people or confidence in

institutions (Field, 2003; Grootaert & van Bastelaer, 2002; Harper, 2001; Jones & Woolcock, 2009; Lowndes & Pratchett, 2005; Pretty & Frank, 2000; van Deth, 2008). Recently, Wagner and Fernandez-Gimenez (2009) reported on a study of eight community-based collaborative groups in Colorado. They used a mail-back survey to assess four dimensions of social capital: trust, rules and norms of reciprocity, values and beliefs, and communication quality and quantity. Individual indicators of these dimensions included questions about the group members' willingness to compromise, share resources, show concern for group welfare (rules and reciprocity), willingness to listen, respect for each others' viewpoints, and share information (communication). Because of the comparable scale and context, this study uses similar indicators to assess levels of social capital.

4. METHODS

This study relies on quantitative data collected using a mail-back questionnaire that employed both a longitudinal and cross-sectional methodology. A number of questions were replicated from a wildland fire survey conducted in 2004, and we re-contacted respondents who participated in that survey. Individuals who responded to both surveys made up our panel of interest. To help inform our understanding about the public's perception of community involvement in forest management and the Coalition, the questionnaire asked respondents about their perception of the group, its partnership with the Forest Service, and the Coalition's representativeness of community interests. Some of these questions were included in the survey conducted in 2004, allowing for longitudinal comparisons. Questions only asked in 2011 were primarily designed to gather information about networks among community members, between the community and Coalition, and between the community and the Forest Service.

4.1 Quantitative Data

The mail-back questionnaire was based in part on a wildland fire survey conducted in the same study area in 2004, allowing for longitudinal comparisons of responses to some questions. This methodology provides a number of advantages. Most importantly, it enables researchers to measure change over time and collect more evidence of causal relationships. By having multiple measurement points, the researcher can more confidently make generalizations about the target population, especially when responses have remained reliable over the study period (Frees, 2004). The replicated questions relate to the public's thoughts on community involvement in forest management and its perception of the Coalition, including its representativeness of community interests. These data will aid the interpretation of questions about the relationship between the community and Coalition.

Questions added in 2011 use a cross-sectional methodology. They were designed to assess current levels of bonding, bridging, and linking social capital, as well as the partnership's impact on social capital in the communities adjacent to the Colville National Forest. Cross-sectional data provides a snapshot of the study population at one point in time. While this methodology does not provide the ability to track changes over time, cross-sectional designs are often used to establish a baseline of knowledge in an area of study, and are common in research about human dimensions of natural resource management (Babbie, 1995).

4.1.1 Survey Design

Based on the literature review and other social capital assessments, we used measures of trust, communication, and norms of reciprocity to assess networks (1) among community members (bonding social capital), (2) between the Coalition and the community (bridging social capital), and (3) between the Forest Service and the community (linking social capital). For each network type (bonding, bridging, linking) three to four measures were developed for each of the social capital dimensions (trust, communication, norms of reciprocity). Figure 2 (next page) represents the network types and dimensions of social capital included in this study. Individual measures are based on the literature (Aspen Institute, 1996; Krishna & Shrader, 2002; Morfort, 2007; Onyx & Bullen, 2000; Schueller, Yaffee, Higgs, Mogelgaard, & DeMattia, 2006; Stone & Hughes, 2002), although some have been modified to better fit the context and purpose of this study. Due to time and resource constraints, this study uses communication quality and quantity as a proxy for network quality. Other studies have used this methodology in the past (e.g. Wagner & Fernandez-Gimenez, 2009).

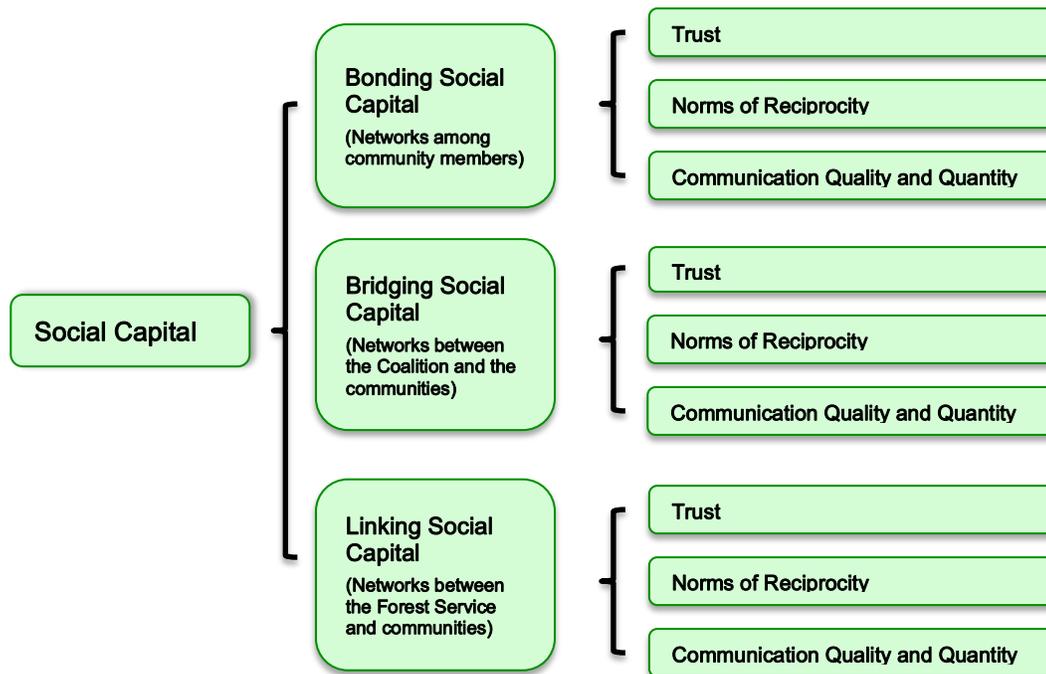


Figure 2 Network types and dimensions of social capital included in this study

In this study, we assume that the communities studied are relatively homogenous and therefore use questions about networks among community members to assess the level of *bonding social capital*. This assumption is based on the region's history as a resource-based economy and the relative economic importance resource-based sectors like forestry, mining, and agriculture still have in this area today (Daniels, 2004). Questions about networks between the community and the Coalition are used to assess the level of *bridging social capital* because the Coalition represents people with different backgrounds and perspectives. Finally, questions about community-Forest Service networks are used to assess the level of *linking social capital* because there are clear differences in power and authority between the communities and the agency.

Most questions were asked on a Likert scale. Some questions allowed respondents to answer *Don't know*, while others required a response. *Don't know* responses were removed from the dataset for all statistical analyses. However, questions receiving an especially high number of *Don't know* responses (>15%) are

noted throughout this document, because they may be an important consideration in discussing the study's results.

4.1.2 Implementation & Response

Surveys were sent to 237 Northeast Washington residents (Ferry, Stevens, and Pend Oreille Counties) who had participated in the study about wildfire management in 2004. Communities included in the study adjoin the Colville National Forest. A mail-back survey methodology was used following standard Dillman (1978) routines, including a three-wave protocol. Two weeks before the first mailing, participants received a postcard alerting them to expect a survey package. Packages consisted of a personalized cover letter, a questionnaire, and a self-addressed, stamped return envelope. Two follow-up mailings were sent to non-respondents in three-week intervals starting in November of 2011.

We located 237 of the 286 original respondents. Of these, 30 were removed from the sample (19 had moved out for the study area, 11 were deceased or unable to complete the survey). From the usable sample of 207 addresses, 111 completed the questionnaire, resulting in an adjusted response rate of 54%. This level of response is considered sufficient for a descriptive study of this nature (Needham & Vaske 2008). However, due to the small sample size, results cannot be generalized to the larger population. Nevertheless, they will provide important information to Forest Service personnel and the Coalition about the public's perception of past efforts, their impact on networks between communities and the Forest Service, as well as among community members. Finally, results will enable us to make suggestions about how the Coalition and the Forest Service could contribute to further improvements in relationships with members of surrounding communities.

To check for of non-response bias responses to a few key questions by panel members (those who participated in both surveys) and non-panel members (those who participated only in the first survey) were compared using an independent samples t-test. Results revealed no statistically significant differences.

4.1.3 Analysis

Data were analyzed using SPSS v. 19.0 software. Descriptive statistics were used to provide a general overview of respondent characteristics. Following Vaske (2008), variables with response categories in a logical order (i.e. strongly agree to strongly disagree) were treated as continuous, allowing the application of parametric statistical tests. When available, longitudinal data were paired with responses from 2004. Paired t-tests were used to identify changes in response over the study period; statistically significant differences are reported at $p \leq 0.05$ unless otherwise noted. Respondents who were unfamiliar with the Coalition were excluded from analysis of questions specifically about the group or its partnership with the Forest Service.

Data used to assess levels of social capital were analyzed in two steps. Recall that for each type of network – bonding (networks among community members), bridging (networks between the Coalition and community), and linking (networks between the Forest Service and the community) – three to four measures were developed for each dimension of social capital (trust, norms of reciprocity, communication quality and quantity). First, a reliability analysis was conducted to ensure measures of each dimension could be combined into a valid index (see Appendix A for more details about the reliability analysis). A Cronbach's alpha coefficient value of 0.65 is considered sufficient to justify combining certain variables measuring the same latent concept (Nunnally & Bernstein, 1994; Vaske, 2008). Based on results from the reliability analysis, indices were created for each network type and social capital dimension (see also Figure 6, page 31). These indices allowed us to compare the different types of networks (bonding, bridging, linking) using paired t-tests.

Effect size is another important consideration when interpreting the results of a statistical analysis. Statistical significance only provides information about whether or not there is a relationship between two variables – that the finding is not due to chance. It does not provide information about the strength of the relationship. Effect size coefficients are a measure of this relationship and provide

information about the findings' practical significance (Gliner, Vaske, & Morgan, 2001). In small-n studies, like the one discussed here, it is likely that few findings are statistically significant. Effect size coefficients can uncover interesting and valuable information about existing relationships that, in a larger study, might have also resulted in statistical significance (Hoyle, 1999). Table 1 summarizes some of the issues that result when results are reported based primarily on statistical significance.

Table 1 Four possible outcomes when relying exclusively on statistical significance

Significance Level	Effect size	
	Large	Small
Small	No inferential problem	Mistake statistical significance for practical importance
Large	Mistakenly conclude "nothing going on"	No inferential problem

Source: (1999)

In this study, Cohen's d is used to determine effect sizes for both paired and independent samples t-tests. Effect sizes are interpreted according to common interpretation guidelines displayed in Table 2. A small effect size suggests that the observed difference has only minor practical relevance, whereas a large effect size suggests that there is a substantial practical difference between the groups being compared (Gliner, Vaske, & Morgan, 2001).

Table 2 Effect size interpretation

	Small Effect	Medium Effect	Large Effect
Cohen's d	0.20	0.50	0.80 ¹

¹Calculations of Cohen's d can result in coefficients larger than 0.80 if there is more than one standard deviation between the two means being compared.

5. FINDINGS

This section presents key findings about the public's general perception of the Coalition as well as information about levels of social capital. First, relevant findings about respondents' characteristics are presented, followed by results about the public's perception of the Coalition and its partnership with the Forest Service. These findings provide important background information that will later be used to make suggestions on how networks with, and among community members may be improved. The second half of this chapter presents findings about social capital. We used measures of trust, communication, and norms of reciprocity to assess networks among community members (bonding social capital), between the Coalition and the community (bridging social capital), and between the Forest Service and the community (linking social capital). Finally, results about the partnership's impact on networks among community members, and between the community and agency are presented.

5.1 Participant Profile

To better understand who our respondents are and how they think about community involvement in federal forest management in general, the survey included several questions regarding respondents' demographic characteristics and opinions about citizen participation. Among the most relevant findings was that respondents' median age was 62 years and on average they had lived in the study area for 32 years. In 2004, about 40% indicated their livelihood depended on farming, 18% on timber, and 17% on ranching.

Respondents were also asked whether economic or environmental considerations should be given priority in federal forest management, given that priority for environmental concerns may entail economic costs and vice versa. We used a scale ranging from (1) *Highest priority environmental concerns* to (7) *Highest priority economic concerns* with (4) *Environmental and economic concerns should be given equal priority* as a midpoint. In both 2004 and 2011, a relative

majority of respondents preferred approaches that give environmental and economic factors equal priority (Table 3). There were only minor changes in responses over the study period. On average, respondents gave slightly greater priority to environmental concerns in 2011 compared to 2004.

Table 3 Trade-offs between environmental and economic priorities, 2004 & 2011

2004 Mean	2011 Mean	t-value	p-value	Effect Size (d)
4.18	4.02	-1.370	0.174	0.13

Paired t-test; response options ranged from (1) *Priority environmental concerns* to (7) *Priority economic concerns* a (4) *Both environmental and economic concerns* as a midpoint

We were interested in how much value respondents put on citizen participation in forest management. Response categories ranged from (1) *Citizen participation is of no value and adds needlessly to the cost of government*, to (4) *Neutral*, and (7) *Citizen participation is of great value even if it adds to the cost of government*. Respondents were supportive of citizen involvement. Longitudinal data shows community support for citizen involvement increased over the study period, though changes were only minor (Table 4).

Table 4 Value of citizen participation, 2004 & 2011

2004 Mean	2011 Mean	t-value	p-value	Effect Size (d)
4.64	4.89	1.420	0.159	0.18

Paired t-test; response options ranged from (1) *No value* to (7) *Great value* with a (4) *Neutral* as a midpoint

Respondents were also asked whether they thought community groups like the Coalition were a good or bad idea (Figure 3). Overall, responses were very positive in both years and there was no statistically significant difference. The most notable change was the decrease in the number of *Don't know* responses. While more than half the respondents marked *Don't know* in 2004 that number decreased to about one third in 2011.

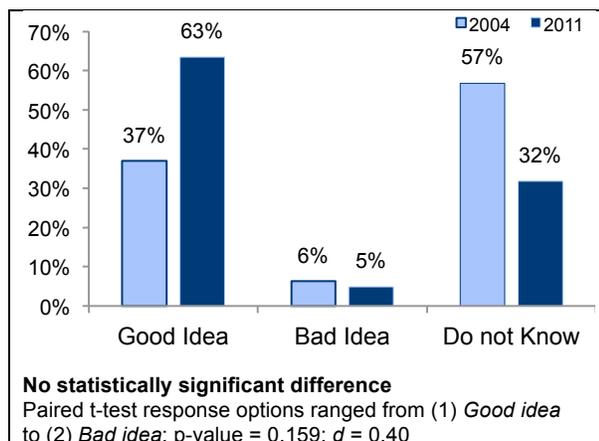


Figure 3 Value of community groups like the Coalition, 2004 & 2011

5.2 Public Perception of the Coalition

To gain a better understanding of the public's perception of the Coalition, the survey first asked respondents about their familiarity with the organization. Response options included (1) *I am a member of the Coalition*, (2) *I am not a member of the Coalition, but am familiar with its purpose*, (3) *I have heard about the Coalition, but know little about it*, and (4) *I have no knowledge of the Coalition*. In 2011, more than half of respondents reported some level of familiarity with the Coalition (Figure 4). Results show a significant increase in familiarity over the study period. The biggest change was the decrease in the number of respondents who had no knowledge of the group. Respondents unfamiliar with the Coalition were excluded from the analysis of questions about the group.

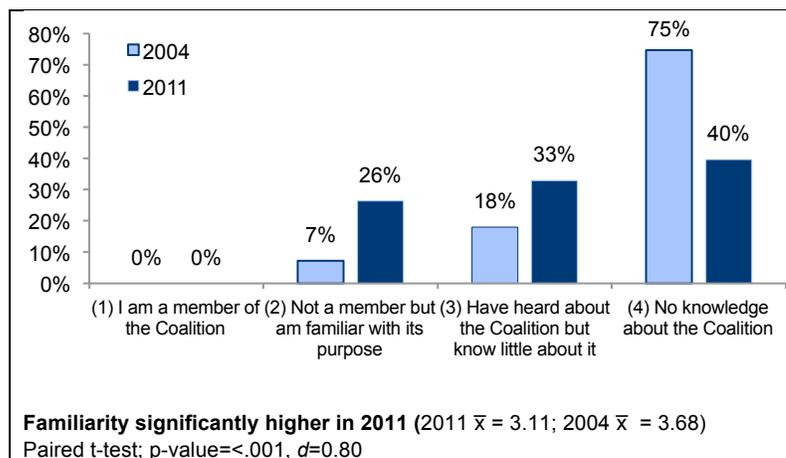


Figure 4 Familiarity with the Coalition, 2004 & 2011

We were interested in respondents' views on how *representative* the Coalition is of different community interests. Respondents were asked how well they thought the Coalition represents (1) them personally, (2) their community, (3) the timber industry, and (4) environmental interests (Table 5). We used a 5-point scale, ranging from (1) *Not at all represented*, to (3) *Moderately represented*, and (5) *A great deal*. Respondents also had the option to choose *Don't know*.

In both 2004 and 2011, the Coalition was thought to be most representative of environmental interests, followed by the timber industry, communities, and respondents themselves. While results indicate no statistically significant changes over the study period, effect size coefficients suggest the perceived representation of respondents personally and their community have increased substantially between 2004 and 2011, though these items still received the lowest ratings (Table 5).

Table 5 Perceived representation of different community groups

<i>How well to you think the Coalition represents the following?</i>	2004 Mean	2011 Mean	t-value	p-value	Effect Size (d)
Environmental interests	3.80	4.13	0.863	0.403	0.29
Timber industry	3.13	3.13	0.000	1.000	0.00
Your Community*	2.53	3.00	1.522	0.150	0.49
Respondents personally	2.07	2.73	2.000	0.065	0.69

*Don't know responses >15%

Paired t-test; response options ranged from (1) *Not at all represented* to (7) *A great deal* with a (4) *a moderate amount* as a midpoint

As Table 5 indicates, the average ratings of the timber industry's representation have not changed between 2004 and 2011. However, a look at the response distribution – displayed in Figure 5 – highlights some important changes in peoples' perception. Noticeably fewer respondents indicated the highest level of representation in 2011 compared to 2004. And overall, responses have moved towards the center of the scale, indicating a moderate level of timber industry representation.

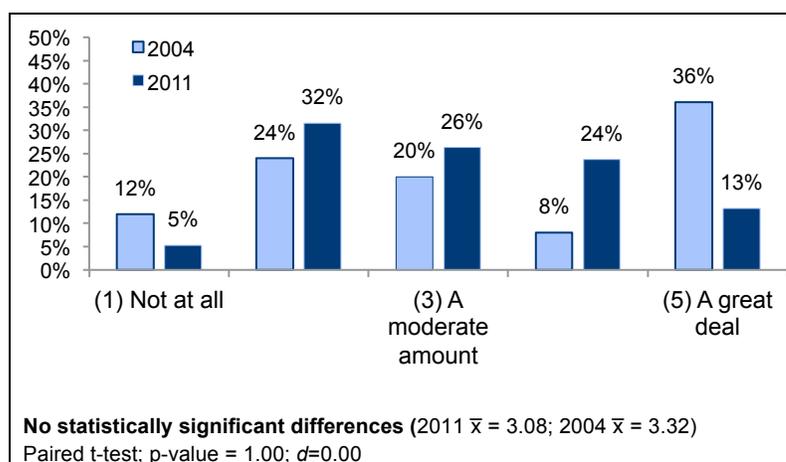


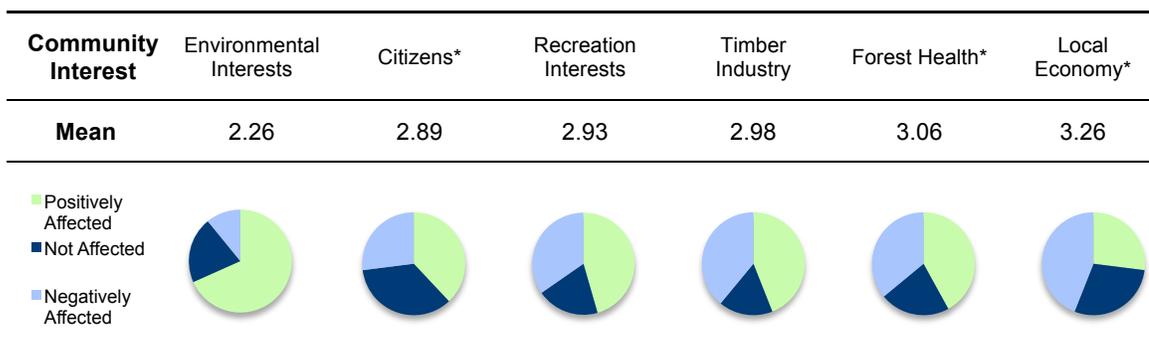
Figure 5 Perceived level of representation of the timber industry by the Coalition, 2004 & 2011

5.3 Perceived Impact of Forest Service-Coalition Partnership on Different Community Interests

We were interested in how the public viewed the partnership's *impact* on different community interests, specifically on (1) environmental interests, (2) citizens living in the area, (3) recreation interests, (4) the timber industry, (5) forest health on the Colville National Forest, and (6) the local economy (Table 6). Response options ranged from (1) *Positively affected* to (3) *Not affected*, and (5) *Negatively affected*. Respondents also had the option of marking *Don't know*. This question was only included in the 2011 survey; results are displayed in Table 6.

On average, environmental interests are thought to be the most positively affected interest, while forest health and the local economy are thought to be slightly negatively impacted. The distribution of responses shows that the perceived impact of the partnership on different interests may not always be well reflected by average ratings. For example, average ratings suggest respondents perceive almost no impact on forest health or the timber industry. However, a look at the response distribution shows many respondents perceive a positive or negative impact of the partnership on recreation interests, timber interests, and forest health. A relatively large number of respondents indicated they did not have enough knowledge (*Don't know*) about the partnership's impact to complete questions about the impact on citizens, the local economy, and forest health.

Table 6 Perceived impact of the partnership on different community interests, 2011



Response options ranged from (1) *Positively affected* to (3) *Not affected*, and (5) *Negatively affected*. Response categories 1&2 as well as 3&4 were combined for presentation purposes.
 **Don't know* responses >15%

5.4 Social Capital

The survey conducted in 2011 included questions about communication, trust, and norms of reciprocity to assess levels of bonding, bridging, and linking social capital. In this study, questions relating to networks among community members are used to assess levels of bonding social capital; questions about networks between the community and the Coalition are used to assess levels of bridging social capital; and questions about networks between the community and the Forest Service are used to assess levels of linking social capital. All questions about these networks provided respondents the following response options: (1) *Strongly Agree*, (2) *Agree*, (3) *Disagree*, and (4) *Strongly Disagree*. Respondents also had the option of marking *Don't know*.

5.4.1 *Bonding, Bridging, and Linking Social Capital*

Networks among community members (bonding social capital) were rated positively by a majority of respondents, suggesting high levels of bonding social capital (Table 7). Particularly noteworthy are the very high ratings of trust among community members and communication about forest management issues. Many of these items, in particular questions about norms of reciprocity received a high number of *Don't know*.

Table 7 Bonding social capital – networks among community members, 2011

		% Agree	% Disagree
Communication	In general, community members are willing to listen to different viewpoints and opinions about forest management.	76	24
	In general, community members openly share information about forest management issues with each other.*	72	28
Trust	Members of this community are honest.	91	9
	Members of this community are true to their word.	84	16
	Members of this community can be trusted.*	85	15
Norms of Reciprocity	Community members are willing to compromise on difficult issues regarding forest management.*	63	37
	Community members respect each other's viewpoints regarding forest management.*	61	39
	Community members show concern for forest health rather than just individual interests related to forest management.*	70	30

* Don't know > 15%

Response categories (1) *Strongly Agree* and (2) *Agree*, as well as (3) *Disagree* and (4) *Strongly Disagree* were combined in the *Agree* and *Disagree* respectively.

Findings about networks between the community and the Coalition (bridging social capital) indicate a rather divided view, and thus suggest varying levels of bridging social capital (Table 8). Responses tend to be almost evenly divided between agreement and disagreement. This pattern holds for questions about communication, trust, and norms of reciprocity with two exceptions: (1) almost two thirds of respondents thought the Coalition follows through on promises, and (2) three quarters of respondents agreed that members of the Coalition respect others' viewpoints.

Table 8 Bridging social capital – networks between the community and the Coalition, 2011

		% Agree	% Disagree
Communication	The Coalition makes their goals and intentions clear to the public.	45	55
	The Coalition shares information with the public.	56	44
	The Coalition is open to input from citizens.*	50	50
Trust	The Coalition is honest with the community about its goals.	50	50
	I trust the Coalition to make management suggestions to the Forest Service that will benefit the community as a whole.	51	49
Norms of Reciprocity	The Coalition follows through on promises.*	63	37
	The Coalition is willing to compromise on difficult forest management issues.	54	46
	Members of the Coalition respect others' viewpoints.*	75	25
	The Coalition shows concern for the entire community, rather than just special interests.	51	49

* Don't know > 15%

Response categories (1) *Strongly Agree* and (2) *Agree*, as well as (3) *Disagree* and (4) *Strongly Disagree* were combined in the *Agree* and *Disagree* respectively.

Data about community-Forest Service networks (linking social capital) also suggest divided public opinion, as the number of respondents who agree and disagree tend to be similar to each other (Table 9). There are three exceptions to this pattern: (1) more than half of respondents thought the Forest Service is open

to public input, (2) about half indicated they did not think the Forest Service is willing to compromise on difficult issues, and (3) slightly more than two thirds indicated they trust local Forest Service managers but do not trust the national government to let them do their job. Several of the questions received a high number of *Don't know* responses.

Table 9 Linking social capital – networks between the community and the Forest Service, 2011

		% Agree	% Disagree
Communication	The Forest Service is open to public input.*	61	39
	The Forest Service does a good job of incorporating public concerns into management plans.*	49	51
	The Forest Service does a good job of explaining their management activities.*	48	52
	The Forest Service openly shares information with the public.*	56	44
Trust	I trust the local Forest Service to contribute to good decisions for maintaining and restoring forest conditions.	59	41
	I trust the local Forest Service to make management decisions that benefit the community.	42	58
	I trust the local Colville Forest Service personnel but I don't trust government at the national level to let them do their job.*	71	29
	Local Forest Service managers effectively build trust and cooperation with local citizens.*	57	44
Norms of Reciprocity	The local Forest Service shows concern for the welfare of communities, rather than just special interests.*	46	54
	The local Forest Service follows through on promises to the public.*	47	53
	The local Forest Service is willing to compromise on difficult issues.*	39	61

* *Don't know* > 15%

Response categories (1) *Strongly Agree* and (2) *Agree*, as well as (3) *Disagree* and (4) *Strongly Disagree* were combined in the *Agree* and *Disagree* respectively.

So far, measures for each social capital dimension (communication, trust, norms of reciprocity) have been discussed individually for each network type (bonding, bridging, linking). To enable comparisons between the different types of networks, variables measuring each dimension of social capital (communication, trust, norms of reciprocity) were combined into indices using a reliability analysis (see Appendix A for details). As shown in Figure 6, this resulted in three indices, describing one social capital dimension each, for each network type (see middle column in Figure 6). These sets of three indices measuring each dimension were then combined into one index describing each network type (bonding, bridging, linking).

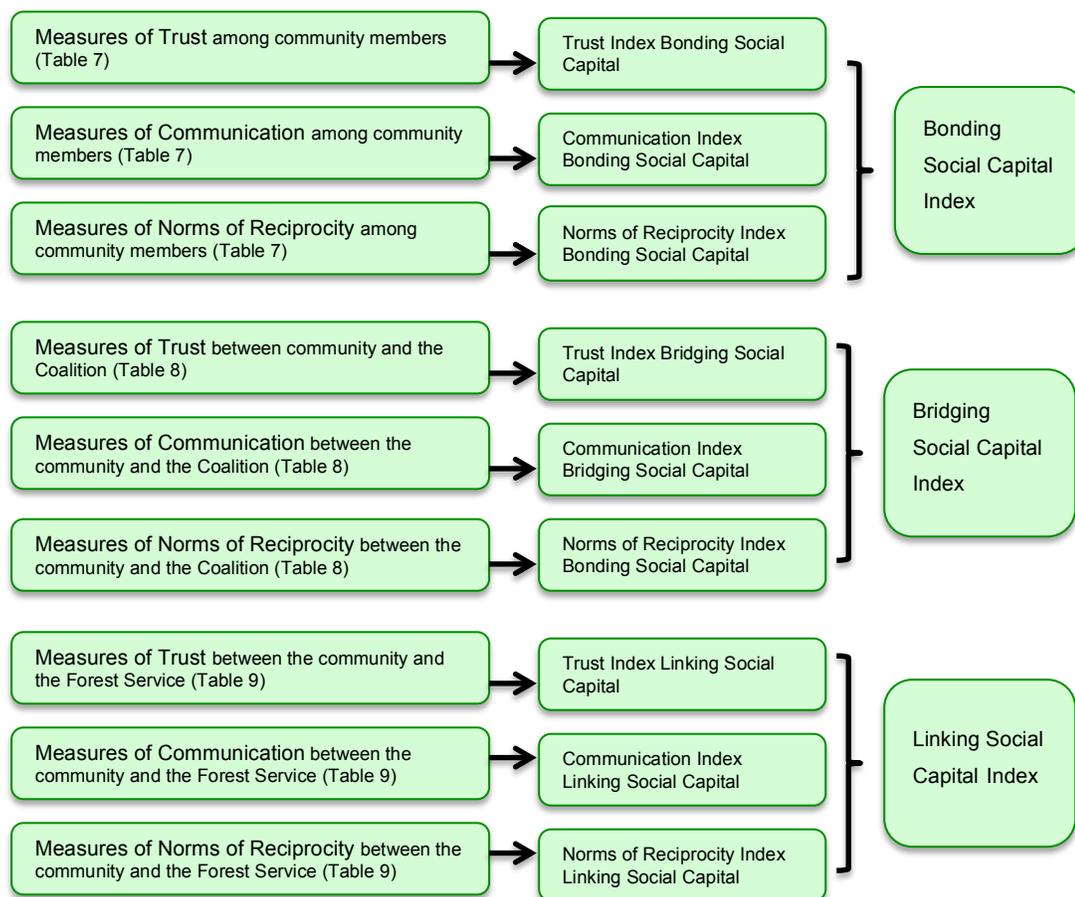


Figure 6 Indices for social capital dimensions and network types

We compared these indices using paired t-tests. Results showed that networks among community members (bonding social capital) are rated significantly higher than both community – Forest Service networks (linking social capital) and community – Coalition networks (bridging social capital) (Table 10). Effect size coefficients confirm that networks among community members are noticeably stronger than community-Forest Service networks and networks between the community and the Coalition. Based on these results, bridging and linking social capital are considered to be at moderate levels.

Table 10 Comparing bonding, bridging, and linking social capital

	Mean	t-value	p-value	Effect size (<i>d</i>)
Bridging Social Capital Index	2.52			
Bonding Social Capital Index	2.23	2.567	0.014*	0.49
Bonding Social Capital Index	2.19			
Linking Social Capital Index	2.47	-3.868	<0.001*	0.53
Linking Social Capital Index	2.59			
Bridging Social Capital Index	2.52	0.332	0.742	0.06

* Significant at 0.05

Indices are based on variables measures on a 4-point scale; response categories ranged from (1) *Strongly agree*, (2) *Agree* to (3) *Disagree* and (4) *Strongly Disagree*

The pattern of high ratings of networks among community members (bonding social capital) remains when examining the ratings of each network type for each social capital dimension (trust, communication, norms of reciprocity) individually (Table 11). Networks among community members always receive the most positive rating, which is always significantly higher than the rating of community-Forest Service networks (linking social capital). Differences between networks among community members (bonding social capital) and community-Coalition networks (bridging social capital) were only significant with respect to trust. Effect size coefficients suggest there is also a noticeable difference with respect to communication.

Table 11 Comparing network types and social capital dimensions

		Mean	t-value	p-value	Effect size (<i>d</i>)
Communication Index	Linking Social Capital	2.52			
	Bonding Social Capital	2.24	3.360	0.001*	0.50
	Bonding Social Capital	2.30			
	Bridging Social Capital	2.57	-2.600	0.130	0.40
	Linking Social Capital	2.53			
	Bridging Social Capital	2.56	-0.248	0.805	0.05
Trust Index	Linking Social Capital	2.40			
	Bonding Social Capital	2.12	3.936	<0.001*	0.53
	Bonding Social Capital	2.17			
	Bridging Social Capital	2.58	-3.182	0.003*	0.75
	Linking Social Capital	2.53			
	Bridging Social Capital	2.54	-0.095	0.925	0.02
Norms of reciprocity Index	Linking Social Capital	2.63			
	Bonding Social Capital	2.35	3.101	0.003*	0.48
	Bonding Social Capital	2.41			
	Bridging Social Capital	2.43	-0.270	0.789	0.05
	Linking Social Capital	2.70			
	Bridging Social Capital	2.44	2.303	0.027*	0.47

* Significant at $p=0.05$; Indices are based on variables measures on a 4-point scale; response categories ranged from (1) *Strongly agree*, (2) *Agree* to (3) *Disagree* and (4) *Strongly Disagree*

5.4.2 High and Low Bridging Social Capital

Findings suggest respondents are divided in their opinion about community-Coalition networks. As shown in Table 8 (page 29) responses to questions about the community's network with the Coalition are almost evenly split between agreement and disagreement, suggesting varying levels of bridging social capital. To better understand the factors associated with high levels of bridging social capital, respondents were divided into two groups depending on whether their responses were positive or negative. An independent samples t-test was used to see if participants who responded positively differed significantly from those who responded negatively. The comparison included 1) demographic characteristics, 2) respondents perceptions of the Coalition representativeness of community interests, 3) the partnership's perceived impact on different community interests, and 4) their level of bonding and linking social capital (see Appendix B for details).

Results indicated no significant differences with respect to respondents' demographic characteristics. Some of the other comparisons, however, did reveal significant differences. On average respondents with higher levels of bridging social capital (community-Coalition networks) indicated a significantly greater priority for environmental considerations, and for citizen participation in forest management; they also had higher levels of linking social capital (community-Forest Service networks). The effect size coefficients for these items suggest there are substantial differences between the two groups.

The most relevant findings are differences in the Coalition's perceived representativeness and the partnership's impact on community interests. Respondents with a higher level of bridging social capital viewed themselves, their communities, and the timber industry to be represented at a greater level compared to respondents with lower levels of bridging social capital. They also perceived the partnership's impact significantly more positive on citizens, the local economy, the timber industry, and overall forest health. All of these differences are associated with large effect sizes, suggesting differences between the two groups are quite substantial.

5.4.3 *High and Low Linking Social Capital*

Findings also indicate respondents are divided in their opinions about the community-Forest Service network, suggesting varying levels of linking social capital. To better understand the factors associated with higher levels of linking social capital, an index was created that combined all measures of the community-Forest Service network. Respondents were divided into two groups depending on whether their responses were positive or negative. An independent samples t-test was used to see if participants who responded positively differed significantly from those who responded negatively. The comparison included respondent's demographic characteristics, the perceived impact of the partnership on different community interests, and respondents' level of bonding and bridging social capital (see Appendix B for details).

No statistically significant differences were found. Effect size coefficients suggest high linking social capital (community-Forest Service networks) respondents have a more positive perception of the partnership's impact on citizens. They also averaged a higher level of bridging social capital. This suggests that linking and bridging social capital are linked.

5.4.4 *Partnership's Impact on Networks among Community Members*

Among the objectives of this study was to gain an understanding of the impact the partnership between the Coalition and the Forest Service has had on networks among community members. In 2011, we asked respondents about the partnership's impact on communication, norms of reciprocity, and trust among community members (see Table 12 for specific measures). Response categories included (1) *Strongly agree*, (2) *Agree*, (3) *Disagree*, and (4) *Strongly disagree*. Respondents also had the option of marking *Don't know*.

Results show respondents rated the partnership's impact on networks among community members largely positive. For example, most respondents believe communication about forest management issues among community members has

increased, and the community is more supportive of finding compromise on difficult forest management issues. However, there was one negative finding. A majority of respondents did not agree the partnership had contributed to an increase in trust among community members with different viewpoints on forest management. All items in Table 12 received high levels of *Don't know* responses.

Table 12 Partnership's impact on networks among community members

<i>Because of the collaboration between the Forest Service and the Coalition...</i>	% Agree	% Disagree
...communication about forest management issues among community members has increased.*	67	33
...community members are more willing to listen to different viewpoints regarding forest management.*	58	42
...community members are more supportive of finding compromise on difficult forest management issues.*	60	40
...community members are more respectful of each others' viewpoints regarding management objectives and practices.*	58	42
...community members are more trusting of each other, even if they have differing viewpoints about forest management.*	42	58
...community members give higher priority to overall forest health rather than individual forest management interests.*	53	47

* *Don't know* > 15%

Response categories (1) *Strongly Agree* and (2) *Agree*, as well as (3) *Disagree* and (4) *Strongly Disagree* were combined in the *Agree* and *Disagree* respectively.

5.4.5 Partnership's Impact on Community-Agency Networks

We were also interested in the partnership's impact on community-Forest Service networks. In 2011, we asked respondents about the impact of the partnership on communication, norms of reciprocity, and trust between the community and the Forest Service (see Table 13 for specific measures). Response categories included (1) *Strongly agree*, (2) *Agree*, (3) *Disagree*, and (4) *Strongly disagree*. Respondents also had the option of marking *Don't know*.

Responses about the partnership's impact on community-agency networks were mostly positive. For example, most respondents believe communication between

the Forest Service and the community, and the agency's willingness to listen to community concerns have increased. However, a couple of questions received negative responses. More than half of respondents disagreed with the statement that local Forest Service managers had become more open to different views and opinions about forest management. Furthermore, about three quarters of respondents indicated public trust in the agency had not increased as a result of the partnership. More than two thirds also felt the Forest Service had become less responsive to interests not represented by the Coalition. All questions related to the partnership's impact on community-agency networks received a high number of *Don't know* responses.

Table 13 Partnership's impact on community-agency networks

<i>Because of the collaboration between the Forest Service and the Coalition...</i>	% Agree	% Disagree
...the relations between local Forest Service managers and the public have improved.*	58	42
...communication between the Forest Service and the public has increased.	55	45
...the local Forest Service's willingness to listen to community concerns has increased.*	62	38
...public trust in the local Forest Service has increased.*	25	75
...local Forest Service managers are more open to different views and opinions about forest management.*	44	56
...the local Forest Service has become less responsive to interests not represented by the Coalition.*	69	30

* *Don't know* > 15%

Response categories (1) *Strongly Agree* and (2) *Agree*, as well as (3) *Disagree* and (4) *Strongly Disagree* were combined in the *Agree* and *Disagree* respectively.

6. DISCUSSION

The literature suggests partnerships between governmental and non-governmental organizations, as well as inclusive decision-making processes may contribute to the development of social capital (Field, 2003; Huntoon, 2001; Lewis, 2010; Warner, 2001). Social capital is in turn considered important for positive community-agency relationships and collective action (Frentz et al., 2000; Leach & Sabatier, 2005; Leahy & Anderson, 2010). Based on previous research, it appears Coalition members and Forest Service managers have been successful at building trusting relationships with each other (Gordon et al., 2012). We were interested in assessing networks among community members (bonding social capital), community-Coalition networks (bridging social capital), and community-Forest Service networks (linking social capital). Additionally, we examined the impact the partnership has had on *networks among community members* and *between the community and the Forest Service*.

Findings indicate that networks among community members (bonding social capital) are rated much higher than community-Coalition (bridging social capital) or community-Forest Service networks (linking social capital), which is not unexpected, especially in rural settings (Onyx & Bullen, 2000). The literature suggests high bonding social capital can potentially pose a barrier to building inclusive collaborative efforts (Putnam, 2000). However, our findings also indicate that bridging and linking social capital are at moderate levels, which may mediate the potential negative consequences of strong bonding networks. Respondents rated the partnership's impact on networks among community members and community-Forest Service networks mostly positive. Yet, results suggest the partnership has not increased *trust* within these networks. Targeted action is needed to build trust, which will ultimately increase bridging and linking social capital. The following discussion provides a review and analysis of the study's findings. This discussion is followed by the conclusion, which presents suggestions on how the Coalition and the Forest Service could contribute to further social capital development in rural Northeast Washington communities.

6.1 Public Perceptions of the Coalition

Findings indicate the Coalition is primarily perceived as an environmental organization. Most respondents did not feel represented by the group, even though longitudinal data show some improvements between 2004 and 2011. In fact, respondents view themselves and their community to be the least represented interests. Among the most interesting findings is the public's perception of the timber industry's representation by the Coalition, particularly given that representatives of a local mill and co-generation plant were founding members of the Coalition and have held leading positions in the group since. The perceived level of timber industry representation has decreased over the study period. In 2004, respondents thought the timber industry was very well represented, while in 2011 most respondents thought the timber industry was only moderately represented.

There are several potential explanations for the public's perception of the Coalition as representing primarily environmental interests. First, a number of Coalition members are associated with various environmental organizations. Second, the public's perception may be related to a proposed wilderness designation on the Kettle Crest Range, one of the most publicized and debated objectives of the Coalition. The issue has recently led to opposition from local ranchers and recreationists, and has received a lot of public attention (Kramer, 2008; Welch, 2012).

More generally, federal forest management objectives have changed significantly over the past decades. Today's approach puts greater emphasis on serving a variety of demands and including diverse public interests in the decision-making process. This is quite different from past management, when objectives were more focused on timber and fewer interests were considered in the decision-making process.

The perception of the Coalition as a primarily environmental organization may explain partly why few respondents feel represented by the Coalition. Most survey

respondents prefer management approaches that give environmental and economic concerns equal priority.

6.2 Public Perception of the Partnership's Impact on Community Interests

Most respondents felt the Forest Service-Coalition partnership has had a positive impact on environmental interests. However, respondents were divided in their view on the partnership's impact on other community interests included in the survey (citizens, local economy, timber industry, recreation interests, and forest health on the Colville National Forest). While many perceived a positive impact, almost as many perceived a negative impact on these interests.

A look at the partnership's record suggests it has had a positive impact on the local economy and in particular the timber industry. For example, the Coalition has received several small grants from the National Forest Foundation (McGee, 2009) and recently, in collaboration with the Forest Service, secured close to one million dollars in funds for restoration over the next ten years through the Collaborative Forest Landscape Restoration Program. It is estimated this grant will create 258 part and full-time jobs, resulting in close to \$10 million of direct, indirect, and induced income (Northeast Washington Forestry Coalition & Forest Service, 2011). Much of the funding the Coalition and the Forest Service have been able to secure has been awarded to local businesses in the form of stewardship contracting to conduct mechanical thinning and other vegetation management activities. According to Charnley *et al.* (2009), these kinds of management activities carried out through stewardship contracting are likely to create the most economic benefit to local communities, compared to other contractual arrangements. In interviews, representatives of the local mill and co-generation plants have indicated the partnership between the Coalition and the Forest Service has provided the supply of materials necessary for the plants' continued operations (Gordon *et al.*, 2012).

Respondents' impression of a negative economic impact of the partnership could be related to a number of different factors. In this context, it is important to consider the respondents' median age of 62 years and average time of residence in the area of 32 years. It is likely many have experienced much higher timber harvest rates during the 1980s and 1990s. Additionally, the relative contribution of the timber industry to the region's economy has declined substantially since the early 1980s (Headwater Economics, 2007).

A large number of respondents also perceived no impact of the partnership on community interests, and many indicated they did not have enough knowledge to judge the impact on the local economy, citizens, and forest health. These findings suggest a large number of respondents have little or no experience with the Coalition and its partnership with the Forest Service.

These results, combined with the perceived low level of timber industry representation, suggest the Coalition's overall objective of addressing both environmental and economic needs may have been overshadowed by some of its more conservation-driven objectives, in particular wilderness designation. At the same time, the partnership may be held responsible for changes out of their control, such as national forest policy changes, or decreased economic relevance of timber sector.

6.3 Social Capital

The survey conducted in 2011 included a number of questions about communication, trust, and norms of reciprocity to assess levels of bonding, bridging, and linking social capital in the communities sampled. Questions relating to networks among community members are used to assess the level of bonding social capital; questions about networks between the community and the Coalition are used to assess the level of bridging social capital; and community-Forest Service networks are used to assess the level of linking social capital.

6.3.1 Bonding, Bridging, and Linking Social Capital

Bonding social capital received very high ratings, while bridging and linking social capital were both rated at moderate levels. Overall, results indicate networks among community members (bonding social capital) are rated much higher than networks between community members and the Coalition (bridging social capital) or the Forest Service (linking social capital). According to Onyx and Bull (2000), patterns of high bonding social capital are common in rural areas and can have negative consequences. These strong networks are often limited to insiders and are usually not extended to minority groups within the community or to outsiders who do not share the same viewpoints. The literature also suggests that high levels of bonding social capital may prevent the building of community capacity and resilience because trust, norms of reciprocity, and chances of leveraging external resources tend to be lower than in communities with high bridging or linking social capital (Putnam, 2000; Woolcock, 2001). However, results from this study indicate moderate levels of bridging (community-Coalition networks) and linking social capital (community-Forest Service networks) are present and can potentially mediate the negative implications of strong bonding networks. Both play an important role in creating productive collaborative efforts.

It is important to note that levels of bridging and linking social capital appear to vary substantially among respondents. Respondents with high bridging social capital tended to have greater knowledge of several factors, such as who the members of the Coalition are, and how their work might affect citizens or the local economy. For example, respondents with a high level of bridging social capital tend to view the Coalition as more representative of them personally, as well as their community, and the timber industry. They also viewed the partnership's impact to be more positive on citizens, the local economy, the timber industry, as well as overall forest health. And finally, respondents with a high level of bridging social capital also indicated much higher levels of linking social capital than other respondents. Respondents with low bridging social capital knew little or nothing about these factors.

These findings suggest two things: (1) levels of bridging social capital vary noticeably among respondents, and (2) levels of bridging social capital could potentially be improved by creating broader awareness about who the Coalition's members represent, what the group's objectives are, as well as how these objectives might impact citizens.

Respondents also appeared divided with respect to linking social capital (community-Forest Service networks). Although in this case, respondents with high linking social capital only differed on a few items from respondents with low linking social capital. Those with high linking social capital tended to perceive the partnership's impact on citizens to be more positive for citizens; they also tended to have higher levels of bridging social capital. Because there are not many significant differences between high and low linking social capital respondents, it is more difficult to suggest specific efforts to improve this type of social capital. Yet, results suggest that improvements in bridging social capital could also result in higher linking social capital.

6.3.2 Partnership's Impact on Networks among Community Members and Community-Forest Service Networks

Findings suggest networks among community members have been positively impacted by the partnership between the Coalition and the Forest Service. Respondents reported a positive impact on communication, people's willingness to listen, and support for finding compromise on difficult forest management issues. They also indicated that respect for each other's viewpoints on management practices had increased and that higher priority is given to forest health, rather than special interests. These results suggest an increase in bridging networks among community members. However, not all findings were positive. For instance, most respondents did not agree that the partnership had contributed to an increase in trust among community members with different viewpoints on forest management. Distrust among individuals with different opinions or perspectives is a feature of strong bonding networks. It can pose a barrier to building bridging

networks (e.g. community-Coalition networks) because it can negatively impact, for example, the sharing of information and resources, and decrease the likelihood that individuals engage in collaborative behavior (Putnam, 2000; Woolcock, 2001).

Data about the partnership's perceived impact on community-Forest Service networks are mixed, but do suggest several important improvements in linking social capital. Many respondents indicated that communication and willingness to listen to community concerns had increased. However, about two thirds indicated local Forest Service managers had not become more open to different views and opinions about forest management, and that public trust in the agency had not increased as a result of its partnership with the Coalition. Similar to distrust among individuals with different opinions, distrust towards the Forest Service can pose a significant barrier to building linking social capital, as people are less likely to engage in collaborative behavior because they do not trust the agency will reciprocate.

7. CONCLUSION

In recent decades, U.S. forest policy has put greater emphasis on including the public in management decisions. Increasingly, community groups like the Northeast Washington Forestry Coalition are working with local agency managers on decisions affecting the area they live in. Research suggests the development of social capital may play an important role in promoting agency-community relationships.

Studies of social capital in rural communities show it is common to find high levels of bonding and lower levels of bridging and linking social capital. Results from our study corroborate these findings. Based on our analysis, bonding social capital – networks among community members – is very high, while bridging (community-Coalition networks) and linking social capital (community-Forest Service networks) are more moderate. High bonding social capital can potentially pose a barrier to building inclusive collaborative efforts because it decreases the likelihood that people are willing to compromise and engage in collaborative behavior. High levels of bonding social capital may partly explain difficulties the Coalition has encountered when trying to incorporate other interests, such as recreation or ranching groups.

A primary objective of this study was to understand the partnership's impact on *networks among community members* and *between the community and the agency*. Responses indicate that both networks have seen improvements in terms of communication and acceptance of different forest management viewpoints. Additionally, respondents reported the Forest Service's decision-making processes had become more inclusive. However, not all results were positive. A majority of respondents indicated that trust among community members had not increased as a result of the partnership, referring specifically to trust among individuals with different viewpoints on forest management. Similarly, results also indicate that public trust in the Forest Service had not increased as a result of the partnership. Low levels of trust decreases people's willingness to find compromise or engage in

collaborative behavior, because they do not believe others will reciprocate, which makes it difficult to build bridging and linking social capital.

Findings suggest there is potential for the Coalition and the Forest Service to increase bridging and linking social capital through active outreach efforts. First, respondents in general valued citizen involvement in forest management and have a positive opinion about community groups like the Coalition. Second, a large number of people are not aware of the Coalition or its partnership with the Forest Service. Third, people who are aware of the Coalition may have formed an opinion that does not accurately reflect the group's objectives. Findings show knowledge of several factors, such as who the members of the Coalition represent, and how their work might impact citizens or the local economy, are associated with high bridging social capital. These are also factors a large number of respondents appear to have little or no experience with. This suggests active, targeted outreach efforts sponsored by the Coalition and the Forest Service could increase people's awareness of the Coalition's objectives, as well as how its partnership with the Forest Service might impact them personally or things they care about. Yet, merely providing people with information will not necessarily increase social capital. Research suggests interactive outreach methods, such as field tours or one-on-one conversations are most effective at building positive relationships and increasing trust (McCaffrey, 2004; Toman et al., 2008). Such efforts would likely have a greater impact, especially on individuals who have already formed an opinion about the Coalition or its partnership with the Forest Service.

The Coalition and the Forest Service are well positioned to create opportunities for this kind of interaction, for example through field tours of completed projects. Given the public's perception that timber industry interests are not well represented by the Coalition, industry representatives could consider taking an active role in these outreach efforts. They likely have more credibility among residents who are concerned about economic conditions in the area. Greater public support of the partnership will make it more difficult for individual groups to oppose collaborative projects and provide them with a stronger incentive to participate in collaborative management.

Benefits of such opportunities for interaction will likely go beyond building bridging and linking networks between the Coalition, the Forest Service and the community. Bringing people with different perspectives together may enable them to discover “compatible interests,” and areas of mutual concern (Wondolleck & Yaffee, 2000, p. 82). Engaging the public in such outreach activities may thus create opportunities to build bridging networks among community members, and strengthen networks between the community and the Forest Service as well as the Coalition.

Clearly, these efforts will not result in unilateral support of the Coalition, the partnership, or the Forest Service. However, in the absence of active outreach measures, the Coalition may eventually be perceived as a quasi-governmental organization that is not trustworthy. This could severely limit public support for the partnership and strengthen the perception of the Coalition as a special interest group. Such an environment would make it more difficult for the Coalition to achieve its objectives.

Future research opportunities include a follow-up survey documenting changes in social capital. Such a study could also monitor the effectiveness of outreach efforts by the Coalition or the Forest Service to increase bridging and linking social capital. Examining outreach efforts used to increase bridging and linking social capital, for example, field tours of completed projects and demonstration sites, could help identify the most effective methods for building social capital.

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APPENDICES

APPENDIX A: Reliability Analysis

We used three dimensions of social capital (trust, communication, norms of reciprocity) to assess three network types (bonding, bridging, linking). For each social capital dimension, we developed a set of three to four measures (Figure 2, page 17). These measures were based on the literature and other social capital assessments. A reliability analysis was conducted to measure the internal consistency of these variables. A Cronbach's alpha coefficient value of 0.65 is considered sufficient to justify combining certain variables into one indicator (Nunnally & Bernstein, 1994). Based on the results from the reliability analysis, indices were created for each type and dimension of social capital (see also Figure 6, page 31). These indices allowed us to compare different types of networks (bonding, bridging, linking), using paired t-tests.

The communication index for bonding social capital resulted in a Cronbach alpha of 0.60 (Table 14). One variable was not included in this index because its elimination increased the index's reliability ('In general, forest management issues are not discussed much among community members'). The trust index for bonding social capital resulted in a Cronbach alpha of 0.92. This coefficient could have been increased slightly by eliminating one item ('Members of this community are honest'). However, because the alpha coefficient was already very high, the item in question had a total item correlation greater than 0.40, and the fact that the increase would have been minor, as well as for reasons of face validity, the item was not eliminated. Finally, the reciprocity index for bonding social capital resulted in an alpha of 0.75.

Indices measuring communication between the community and the Coalition (bridging social capital) were associated with a Cronbach alpha of 0.91 (Table 15). This coefficient could have been increased slightly by eliminating one item ('The Coalition is open to input from citizens'). However, because the alpha coefficient was already very high and the item in question had a total item correlation greater than 0.40, as well as fact that the increase would have been minor and for reasons of face validity, the item was not eliminated. The trust index for bridging social

capital resulted in an alpha of 0.93, and the norms of reciprocity index in an alpha of 0.91. One variable was not included in the index because its elimination increased the index's reliability ('The Coalition is willing to compromise on difficult forest management issues').

Finally, the index measuring communication between the community and the Forest Service (linking social capital) resulted in a Cronbach alpha of 0.89, the trust index in an alpha of 0.84, and the reciprocity index in an alpha of 0.87 (Table 16).

With the exception of the communication index for bonding social capital, all indices had a Cronbach alpha value greater than 0.65 and are thus justified to be combined into one index. Because the communication index is not substantially lower than the suggested cut-off of 0.65, it will be included in the remaining analysis. However, results based on the communication index should be considered carefully.

Table 14 Reliability analysis of items used to measure networks among community members – bonding social capital

	Item Total Correlation	Cronbach's Alpha if deleted	Cronbach's Alpha
Communication Index ^{1,2}			0.60
In general, community members are willing to listen to different viewpoints and opinions about forest management.	0.427		
In general, community members openly share information about forest management issues with each other.	0.427		
Trust Index			0.92
Members of this community are honest.	0.758	0.935 ³	
Members of this community are true to their word.	0.865	0.847	
Members of this community can be trusted.	0.865	0.847	
Reciprocity Index			0.75
Community members are willing to compromise on difficult issues regarding forest management.	0.602	0.644	
Community members respect each others' viewpoints regarding forest management.	0.581	0.664	
Community members show concern for forest health rather than just individual interests related to forest management.	0.566	0.695	

¹ Variables were measured on a scale from (1) *Strongly Agree* to (4) *Strongly Disagree*.

² One variable was not included in this index because its elimination increased the index's reliability: 'In general, forest management issues are not discussed much among community members', this variable was reverse coded.

³ Because of face validity, and the fact that the variable has a total-item correlation above .40 and an already high Cronbach's Alpha, this variable was not excluded from the index even though elimination would have resulted in a slightly higher Cronbach's Alpha of 0.94.

Table 15 Reliability analysis of items used to measure networks between the community and the Coalition – bridging social capital

	Item Total Correlation	Cronbach's Alpha if deleted	Cronbach's Alpha
Communication Index ¹			0.91
The Coalition makes their goals and intentions clear to the public.	0.878	0.829	
The Coalition shares information with the public.	0.825	0.875	
The Coalition is open to input from citizens.	0.775	0.915 ²	
Trust Index ¹			0.93
The Coalition is honest with the community about its goals.	0.873		
I trust the Coalition to make management suggestions to the Forest Service that will benefit the community as a whole.	0.873		
Reciprocity Index ¹			0.91
The Coalition follows through on promises.	0.937	0.769	
Members of the Coalition respect others' viewpoints.	0.752	0.923 ²	
The Coalition shows concern for the entire community, rather than just special interests.	0.789	0.905	

¹ Variables were measured on a scale from (1) *Strongly Agree* to (4) *Strongly Disagree*.

² Because of face validity, consistency with other groups, an total-item correlation of above .40 and an already high Cronbach's Alpha, this variable was not excluded from the index even though elimination would have resulted in a slightly higher Cronbach's Alpha of .92.

Table 16 Reliability analysis on items used to measure networks between the community and the Forest Service – linking social capital

	Item Total Correlation	Cronbach's Alpha if deleted	Cronbach's Alpha
Communication Index			0.89
The Forest Service is open to public input ¹ .	0.796	0.863	
The Forest Service does a good job of incorporating public concerns into management plans ¹ .	0.775	0.861	
The Forest Service does a good job of explaining their management activities ¹ .	0.789	0.855	
The Forest Service openly shares information with the public ¹ .	0.732	0.876	
Trust Index			0.84
I trust the local Forest Service to contribute to good decisions for maintaining and restoring forest conditions ¹ .	0.783	0.745	
I trust the local Forest Service to make management decisions that benefit the community ¹ .	0.662	0.802	
I trust the local Colville Forest Service personnel but I don't trust government at the national level to let them do their job ¹ .	0.593	0.843	
Local Forest Service managers effectively build trust and cooperation with local citizens ¹ .	0.684	0.793	
Reciprocity Index			0.87
The local Forest Service shows concern for the welfare of communities, rather than just special interests ¹ .	0.755	0.828	
The local Forest Service follows through on promises to the public ¹ .	0.831	0.764	
The local Forest Service is willing to compromise on difficult issues ¹ .	0.700	0.875	

¹ Variables were measured on a scale from (1) *Strongly Agree* to (4) *Strongly Disagree*.

APPENDIX B: Comparing respondents with high and low bridging and linking social capital

Table 17 Comparing respondents with high and low bridging social capital

	Mean Bridging Social Capital		p-value	Effect size (<i>d</i>)
	High	Low		
Environmental vs. economic priorities ¹	3.33	4.25	0.016*	0.82
Value of citizen participation ²	5.53	4.64	0.046*	0.63
How familiar are you with the Coalition ³	2.22	2.42	0.557	0.19
How much to you see your own opinions about forest management reflected in the Coalition's ideas? ⁴	4.69	2.96	<0.001*	1.63
How well does Coalition represent... ⁵				
...you personally?	3.53	2.32	<0.001*	1.45
...your community?	3.73	2.48	<0.001*	1.64
...the timber industry?	3.64	2.70	0.006*	0.93
...environmental interests?	3.67	3.96	0.390	0.30
How do you think the collaboration between the Forest Service and the Coalition has affected ... ⁷				
...citizens	2.15	3.30	<0.001*	1.71
...the local economy	2.44	3.58	0.009*	1.14
...environmental interests	2.00	2.38	0.121	0.49
...the timber industry	2.47	3.32	0.016*	0.84
...recreation interests	2.29	3.24	0.002*	1.08
...forest health on the Colville National Forest	2.00	3.57	<0.001*	1.98
How many years have you lived in this community	20.81	27.88	0.197	0.43
Level of Education ⁹	4.00	3.50	0.280	0.36
Age	52.69	54.54	0.660	0.14
Bonding Social Capital ¹⁰	2.18	2.33	0.123	0.49
Linking Social Capital ¹⁰	2.23	2.78	<0.001*	1.25

* Statistically significant at 0.05

¹ Measures on a 7-point scale (1) *Priority environmental concerns*, (4) *Both environmental and economic concerns*, (7) *Priority economic concerns*

² Measured on a scale from (1) *Citizen participation is of no value*, (4) *Neutral*, (7) *Citizen participation is of great value*

³ Measured on a 4-point scale (1) *I am a member*, (2) *I am familiar with the Coalition*, (3) *I have heard about the Coalition but know little about it*, (4) *I have no knowledge about the Coalition*

⁴ Measured on a scale from (1) *Few decisions reflect my opinions*, (4) *Some*, (7) *Most decisions reflect my opinion*

⁵ Measured on a scale from (1) *Not at all represented*, (3) *A moderate amount*, (5) *A great deal*

⁶ Measured on a scale from (1) *Not Transparent*, (4) *Moderately transparent*, (7) *Transparent*

⁷ Measured on a scale from (1) *Positively affected*, (3) *Not affected*, (5) *Negatively affected*

⁸ Measured on a scale from (1) *Trust had decreased*, (3) *Trust has stayed the same*, (5) *Trust has increased*

⁹ Measured on a scale from (1) *Some high school*, (2) *High school graduate*, (3) *Some college*, (4) *Bachelor's degree*, (5) *some graduate school*, (6) *Completed graduate degree*

¹⁰ Indices are based on variables measured on 4-point scales (1) *Strongly Agree* to (4) *Strongly Disagree*

Table 18 Comparing respondents with high and low levels of linking social capital

	Mean Linking Social Capital		p-value	Effect size (d)
	High	Low		
Environmental vs. economic priorities ¹	3.82	4.06	0.379	0.18
Value of citizen participation ²	4.91	4.92	0.976	0.01
How familiar are you with the Coalition ³	3.27	2.99	0.104	0.33
How do you think the collaboration between the Forest Service and the Coalition has affected ... ⁵				
...citizens	2.38	3.03	0.068	0.78
...the local economy	2.83	3.36	0.313	0.41
...environmental interests	2.10	2.32	0.390	0.28
...the timber industry	2.70	3.06	0.372	0.31
...recreation interests	2.56	3.03	0.223	0.46
...forest health on the Colville National Forest	2.71	3.14	0.387	0.35
How many years have you lived in this community	24.82	26.06	0.730	0.07
Level of Education ⁷	3.45	3.54	0.871	0.04
Age	57.82	54.82	0.242	0.26
Bonding Social Capital ⁸	2.23	2.23	0.978	0.01
Bridging Social Capital ⁸	2.23	2.62	0.094	0.61

* Statistically significant at 0.05

¹ Measures on a 7-point scale (1) *Priority environmental concerns*, (4) *Both environmental and economic concerns*, (7) *Priority economic concerns*

² Measured on a scale from (1) *Citizen participation is of no value*, (4) *Neutral*, (7) *Citizen participation is of great value*

³ Measured on a 4-point scale (1) *I am a member*, (2) *I am familiar with the Coalition*, (3) *I have heard about the Coalition but know little about it*, (4) *I have no knowledge about the Coalition*

⁴ Measured on a scale from (1) *Few decisions reflect my opinions*, (4) *Some*, (7) *Most decisions reflect my opinion*

⁵ Measured on a scale from (1) *Positively affected*, (3) *Not affected*, (5) *Negatively affected*

⁶ Measured on a scale from (1) *Trust had decreased*, (3) *Trust has stayed the same*, (5) *Trust has increased*

⁷ Measured on a scale from (1) *Some high school*, (2) *High school graduate*, (3) *Some college*, (4) *Bachelor's degree*, (5) *some graduate school*, (6) *Completed graduate degree*

⁸ Indices are based on variables measured on 4-point scales (1) *Strongly Agree* to (4) *Strongly Disagree*.

