2013

Sustainable Outdoor Recreation and the Forest Service: Agency Culture, Response to Change and Implications for the Future

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SUSTAINABLE OUTDOOR RECREATION AND THE FOREST SERVICE:

AGENCY CULTURE, RESPONSE TO CHANGE

AND IMPLICATIONS FOR THE FUTURE

by

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A professional paper submitted in partial fulfillment
of the requirements for the degree
of

MASTER OF SCIENCE

in

Human Dimensions of Ecosystem Science and Management

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2013
Abstract

As a product of the Progressive Reform movement of the early 20th century, the Forest Service was created to be a scientific, well-organized, ethical and efficient new form of government. In over a century of service, the agency retains many proud traits and traditions along such lines, but it has been noted as being technocratic and overly rigid in its emphasis on the biophysical sciences, analysis and administrative procedures, and lacking agility in the socio-political aspects of natural resource management. While the agency has endeavored to better integrate the social sciences and improve its policies toward meaningful public involvement, issues have become more complex, nuanced, and conflicting. When compounded with a number of legal, administrative, budgetary and organizational encumbrances, the agency has tremendous difficulty maneuvering in today’s vexing operating environment. Standardized procedures and traditional public involvement methods are proving inadequate for dealing with these complex and “wicked” problems.

Recreation management is an area of increasing complexity and the one we explore in this paper. The Forest Service has national goals for sustainable recreation management, but at the field level, where budgetary and workforce resources are often inadequate, the agency tends to fall back to a “default approach”: the repeated situation where managers allow or even encourage recreation use to occur in an area, but at some point the use and impacts become unacceptable, so managers then attempt to restrict use in the affected area. This pattern has unintended consequences and can worsen conditions in the broader sense, making sustainability goals difficult, if not impossible, to achieve. In restricting use in high-use areas, managers may actually displace users, and their impacts, to other
lesser-used areas. Ironically, the incremental impacts of new visitors to low-use areas tend to be substantial, whereas in areas where high-use is already established, visitors may not be as sensitive to existing impacts as managers tend to be, and the impacts of increasing visitation are negligible. Displacing use, on the other hand, creates new impacts and issues in new places, over and over again, exacerbating ecological and social problems over the broader landscape.

This paper explores Forest Service history and culture, changes in recreation management, the persistent “default approach”, and the promising policy shift toward sustainability and greater collaboration with stakeholders and communities. The paper suggests that sustainable recreation management will be difficult to achieve, however, given particular cultural attitudes, and the issues and encumbrances that beset the agency. The encumbrances include legal and administrative morass, inadequate budgets, and outmoded management actions, furthering the default approach, and moving the agency away from its sustainability goals, not toward them. Drawing on examples in travel planning from the Dixie National Forest, the paper concludes that additional change in agency culture is needed, requiring development and transfer of a new tacit knowledge, through a professional recreation community of practice, with an emphasis on collaborative processes and authentic public participation.
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Acknowledgements

I would like to thank many people who have helped me through the completion of this paper. The first to thank is my committee. Your work has provided an academic perspective that I have used over many years in my own work in outdoor recreation. Through a variety of interactions, your insights and teachings have been captivating and motivating to me. It has been a pleasure and privilege to have been your student. I hope to find reasons to work with each of you again. Thank you for your encouragement and assistance in the final lap of this endeavor.

I would especially like to thank Dr. Dale Blahna, for his particular encouragement and attention with this paper, and discussions over so many related topics. I not only appreciate your knowledge and mentorship, but your friendship as well.

I would like to thank USU students Heather Phillips and Scott Shine, and the late-season relief crew at the Cedar City Ranger District, for their excellent and reliable field work during early research for this project. Best regards wherever you are!

I would like to thank former department research associate, Doug Reiter, and staff assistants Rebecca Hirst and Tracy Jones for their assistance with various technical and administrative aspects of this process.

I am very appreciative of Dr. Laura Straus and Anneliese Ripley, faculty at the University of Montana-Western, in Dillon, Montana, for their invitation to join the local “graduate student support group”. Our meetings, discussions, and sharing of knowledge (and empathy), were tremendously helpful in moving me forward.

I would like to express gratitude to my good friends Susan Leslie, Peggy Gray, Bob Gardiner, and Polly Eberle, who by demonstration of their tremendous work ethic and thoughtful perspectives, kept me inspired in public lands management, service and the importance of keeping people connected with their National Forests. Likewise, I am grateful to many other Forest Service coworkers who encouraged and supported my efforts toward the completion of this degree.

Lastly and most importantly, I thank my family. I want to express deep appreciation to my parents Robert and Dianne Lienemann, for raising my brother and me with so many enriching experiences on National Forests, and other public lands and waters. Thank you also for enabling my earlier education, and your steadfast encouragement with this graduate endeavor. I am also so grateful to my husband and best friend Corey, for his quiet, steady support and for inspiring me through his own dedication to natural resources management. Thanks, Corey, for holding down the fort and covering for my absences while I completed this paper and preceding coursework.

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INTRODUCTION

Like many old institutions, the Forest Service has accumulated a considerable amount of complexity and duality, exemplified in its own motto: *caring for the land and serving people*. This statement poses a very difficult mandate; to provide natural resources for the utilization of people, while at the same time, protecting, conserving and preserving those resources. Adding to the challenge, the work of the Forest Service is subject to participatory American democracy, yet no public consensus exists to support the accomplishment of the agency’s purpose.

This is the story within the story. The Forest Service possesses a culture all its own, replete with rituals, symbols and common experiences, shaped over a long period of time. The agency has a current workforce of approximately 30,000 employees, with each member having been influenced by various experiences over four working generations. That span of time bore witness to great changes in American society, as well as global environmental and economic issues, all of which have shaped the agency’s identity and responsibilities. Today’s Forest Service workforce still has roots in conformist organizational history, but it now exists amid a set of diverse professional requirements, public perspectives and changing workplace expectations. Additionally, a number of legal, administrative, budgetary and organizational problems encumber the agency, making it incredibly difficult for the agency to maneuver in today’s vexing operating environment.

These encumbrances and certain cultural traits of the agency therefore, are a hindrance to its transformation toward its explicit goal of sustainability. Sustainability is
an extremely complex, interconnected problem, but the Forest Service is an agency
designed to provide technical solutions to simpler, typically more linear problems. For
example, it is adept at organizing a decentralized workforce, optimizing the economics of
timber production, engineering roads and facilities, and scientifically managing habitat
for particular species. To meet these needs, the Forest Service has historically employed
an array of administrative officers, foresters, engineers, biologists and other professionals
who are very capable of resolving problems, with technical solutions, within their own
resource areas.

Contemporary issues, however, are more complex, more connected and integrated,
expansive and political. Traditional, linear technical methods cannot resolve these
“wicked” problems, as they are called, because they require value judgments to be made,
involving individuals, groups and networks of people (stakeholders) who often do not
agree on solutions, and sometimes even on the definition of the problem. The “rightness”
of an issue, of whether to do an action in the first place, is often not agreed-upon and
usually contested by at least one stakeholder. In the attempt to find an agreeable solution,
wicked problems often involve power struggles, misunderstandings, constantly changing
conditions, morphing and developing new wicked problems along the way. Wicked
problems require a focus on non-competitive, authentic stakeholder participation,
adaptive management and taking planned, iterative steps. These processes comprise
relatively new territory for the Forest Service, an agency that is more accustomed to
utilizing “command-and-control” approaches, and bound by budgetary and accountability
timeframes and procedures that in many ways do not align with this new paradigm. In
order to overcome a “default approach” that would defeat steps toward sustainability, a
new skillset must be developed in the art and science of collaborative processes, and transferred throughout all levels of the agency, as tacit knowledge.

Although the Forest Service has endeavored toward better incorporation of ecosystem sciences and engineering with human values, agency is steeped in historical precedence and a number of legal and administrative encumbrances that keep it from constructively addressing today’s highly complex, politicized decision-making and policy environment, and compelling its managers to often fall back to the “default approach”. This is the thesis of this paper. Focusing on recreation management, this paper develops a historical and contemporary agency context, identifies several barriers and challenges to sustainability, and makes recommendations for planning and management approaches that are more socially, economically, and ecologically sustainable. Using the case of travel management on the Dixie National Forest in southwestern Utah, we illustrate the difficulties of dealing with recreational change, and the value of using more collaborative approaches.
CHAPTER 1: THE CHANGING LANDSCAPE—A CHANGING AGENCY

Off-Highway Vehicle Use on the Dixie National Forest

Since the late 1990s, the Cedar City Ranger District in southwest Utah has been an increasingly popular destination area for off-highway vehicle (OHV) use. The Duck Creek area in particular has long been considered the main “hot-spot” for OHV use on the Dixie National Forest (Carter, 2004). Located on the Cedar City Ranger District of the Dixie National Forest, the Duck Creek area is approximately 30 miles east of Cedar City and is situated where the counties of Iron, Garfield and Kane meet (Fig. 1).

Figure 1: The Cedar City Ranger District and Duck Creek/Swains project area, located in Southwestern Utah. Source: Duck Creek-Swains EIS.
Several factors made the Duck Creek area a prime destination for recreation and tourism. Brian Head Town and Ski Resort, Cedar Breaks National Monument, Ashdown Gorge Wilderness, Yankee Meadows Reservoir, Navajo Lake, Cascade Falls, Mammoth Creek and Panguitch Lake, Aspen Mirror Lake and Strawberry Point Overlook are all within approximately 10 air-miles of the Duck Creek area (USDA, 2003).

Duck Creek Village is bisected by Highway 14, and offers several amenities including lodging, a gas station, convenience stores, a few restaurants, and OHV rentals. It is also located at the heart of the Forest Service’s designated Duck Creek ATV trail system, and connecting to the broader Markagunt ATV trail system (Carter, 2004). Highway 14 connects on the west end with Interstate 15 and the communities of Cedar City and St. George, and at the east end connecting to Utah’s renowned scenic Highways 89 and 12. These three state highways are designated Scenic Byways that provide tourist access through National Forest land to western movie towns, Bryce Canyon and Zion National
Parks. Several popular Forest Service recreation sites surround the Duck Creek area and are easily accessed from Highway 14.

The popularity of the Duck Creek area grew along with the extraordinary population growth in Las Vegas, Nevada (only 3 hours from Cedar City) during the 2000s, and that of nearby St. George and the Salt Lake Valley to the north. According to the US Census Bureau (2007) St. George was the top fastest-growing metropolitan area from April 2000 to July 2006, with 39.8% growth. Las Vegas was ranked fifth at 29.2% growth and the Provo-Orem area south of Salt Lake City was sixth at 25.9% growth during that period. Additionally, private-land “inholdings”, surrounded by National Forest lands were subdivided into hundreds of recreational properties. These inholdings had previously been large tracts historically used for ranching, but have been broken into small residential/recreational parcels over recent years. The few cabins that existed over the previous 40 years have multiplied dramatically into the rapidly growing community of Duck Creek Village and other expanding mountain communities within a 5-15 mile radius.

The Bureau of Economic and Business Research, University of Utah, reported that in 2007, over one-third of the housing units in Kane County were seasonal or recreational units, the highest percentage in the five southwestern counties in Utah (Bureau of Economic and Business Research, 2008). Twenty-six percent of all housing units in Kane County were built after 2000, and from 2005 to 2007, permits for a total of 783 dwelling units were issued in Kane County. Kane County (containing Duck Creek Village) reportedly issued about 250 building permits per year for the area throughout the early 2000s (Carter, 2004). These included more than a half-dozen large subdivisions,
each filling the greater portion of a square-mile section apiece (Figures 2 and 3). According to local real estate agents contacted by the Cedar City Ranger District during that time, most buyers of the property were from the Las Vegas area, many of whom were interested in the area because of readily available OHV riding opportunities (Carter, 2004). The OHV boom had met the place and time of extraordinary real estate growth.

<table>
<thead>
<tr>
<th>Utah County</th>
<th>OHV Registrations</th>
<th>% Change 1998-2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1998</td>
<td>1999</td>
</tr>
<tr>
<td>Beaver</td>
<td>271</td>
<td>406</td>
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<tr>
<td>Garfield</td>
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<td>297</td>
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<tr>
<td>Iron</td>
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<td>Kane</td>
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<tr>
<td>Millard</td>
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<td>Wayne</td>
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<tr>
<td><strong>Total</strong></td>
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<td>44,219</td>
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</tbody>
</table>

Table 1: OHV Registration for Select Utah Counties. Source: Historical Off-road OHV Registrations, Utah Division of Motor Vehicles (Hayes, 2005).

The Dixie National Forest had been a recreation destination for visitors from the Las Vegas area for many years. The results of a 1994 survey completed by A & A Research.
indicated that 49 percent of the Las Vegas, Clark County, area residents surveyed had visited the Dixie National Forest at least once within the year prior to the survey (A & A Research, 1994). In 2004, the majority of forest visitors surveyed for the National Visitor Use Monitoring (NVUM) were shown to hail from Cedar City and St. George, and the Las Vegas area (USDA, 2004). During the same time period, registrations of OHVs in Utah also ballooned (Table 1).

Concurrent with increasing OHV use, the Forest Service reported an increase in social conflicts and impacts to natural resources. The Duck Creek-Swains area had long been identified as an area of concern. In 1999, an interdisciplinary team was assembled to develop access management objectives for the Cedar City Ranger District. Six geographic areas were delineated for the process, including the Duck Creek-Swains area. Within that geographic area, timber and range were identified as predominant management emphases, subdivisions were identified as a unique issue, and it was noted that OHV use was widespread, stating that illegal use and resource damage were of high concern (Dixie National Forest, 1999). In 2000, a collaborative effort between the Natural Resource Coordinating Council (NRCC) of Utah and the National Off-Highway Vehicle Conservation Council (NOHVCC) identified 100 OHV “hotspots” located throughout Utah. These were considered to be areas most at risk of becoming or were already of high concern for OHV management. Twelve of these areas were located on the Dixie National Forest, including the Duck Creek-Swains area. In response to identification of the 12 hotspots, the Dixie determined that management action would be necessary to protect natural resources and to meet federal mandates and direction in the forest plan (Divine, 2004).
In 2001, Northern Arizona University was contracted by the Dixie to conduct a baseline inventory of route and site conditions within these hotspots. Within the Cedar City Ranger District, the Duck Creek-Swains area was identified as having the highest number of impacts (Divine, 2004; Divine and Foti, 2004). In the Duck Creek area and a number of other areas within the system of public lands, a perception of crowding and increased ecological impacts emerged among land management agency employees (Baird and Prettyman, 2005). Subsequently, the Forest Service intensified its management of OHV use in the Duck Creek and other areas (USDA, 2003; Carter, 2004). The Duck Creek-Swains Access Management Project Environmental Impact Statement (hereafter referred to as the Duck Creek-Swains EIS) was initiated to address localized problems with erosion, sedimentation and adverse effects to wildlife, being caused by the proliferation of user-created routes and high road density (USDA, 2003). Internal input and comments received during scoping identified the following issues and developed alternatives that would address the issues:

1. Motorized routes, whether open or closed to public use, were causing fragmentation of wildlife habitat and sedimentation, by compacting soils, channelizing water, and hampering vegetation growth.

2. Routes that would be closed were used by the public to provide access to scenic vistas, woodcutting areas, and opportunities for picnicking, hunting and camping.

3. Increasing ATV and OHV use on fewer roads left open would not meet demand for this activity.
4. Use on roads left open could cause impacts to goshawk and peregrine falcon nesting areas, rims, meadows, and other sensitive areas for wildlife. Use of existing roads had the potential of disturbing wildlife that use these habitats, and degrade these habitats.

5. Roads cause changes in natural drainage patterns by intercepting subsurface flow, preventing infiltration, and redirecting flow.

The need for action was described as arising from initial analysis that found that the Duck Creek-Swains area had high road density and excessive impacts to wildlife habitat and watershed resources.

Some recreational behavior was indeed concerning: OHVs were being used for hill-climbing and mud bogging, and stream crossings were becoming more severely impacted. Rutted tracks were increasingly discovered “pioneering” off-road into the woods and through delicate meadows and wetlands (Figures 5 and 6).

Some OHV use, particularly the problem of unsupervised children, was resulting in the illegal development of unauthorized motocross-style tracks associated with the use of dispersed campsites (Figure 7). Signs and closure barricades were being vandalized, and
evidently, a number of riders were ignoring the agency’s route restrictions by driving around the closures. As motorized networks expanded and became more interconnected, more riders were venturing into areas that previously experienced low-use.

With the release of the Duck Creek-Swains EIS (USDA, 2003), the Forest Supervisor directed that a plan be developed to move toward a desired condition of improving watershed conditions by managing motorized vehicle use within the project area. The primary objective for the project was to reduce the area’s inventoried road density from 4.9 miles per square mile to meet the forest plan requirement of no more than 2 miles per square mile (USDA, 1986; USDA, 2003). In the course of inventorying the project area, the Forest staff identified numerous “unnecessary routes”. These consisted of user-made recreational routes as well as those created by the Forest Service for past management activities, primarily timber harvesting. These unnecessary routes were proposed for closure under the Duck Creek-Swains EIS.

The project’s target reduction in open motorized routes was not well accepted by some motorized users or the county government officials who were concerned about the loss of motorized access to public land and potential impacts to local OHV-related economic opportunities. The EIS was threatened with appeals by access advocates, as well as by environmentalists.
who felt the project didn’t go far enough in dealing with an area with such high motorized use and obvious impacts. An extensive effort was undertaken by the Forest Service to find a compromise with county commissioners, resulting in a small number of additional, but very important, routes that should remain open. This allowed for essential connectivity of the trail network, and thus the project went forward with the cautious support of the motorized access advocates and local county commissioners (Carter and Meier, 2005).

Garnering acceptance from the environmental community as well, the project resulted in the closure of approximately 50% of the motorized routes in the project area (USDA, 2003), reducing route density to just above two miles per square mile. Expanded collaborative efforts allowed the Forest Service to work with recreational users, determining that the majority of these routes were actually less important to the riders. Although travel planning and management often makes managers nervous because of anticipated controversy, this case spurred a more collaborative relationship than had previously existed between county officials, the Forest Service, and the environmental community. Ultimately, the EIS was not appealed or litigated. However, the planning effort was only the first step in a process of cooperative management that would require years to successfully implement (Carter, 2004).

In this paper, we use the case of the Duck Creek-Swains EIS to illustrate a common scenario we refer to as a “default approach” to public lands recreation management. This happens when managers allow or encourage use to occur in an area, but at some point the use and impacts become unacceptable. Managers then attempt to identify a capacity or move directly to restricting use in the affected area; often triggering unanticipated levels
of controversy that now further complicate the process. In this particular case, the default approach began when the project was been initiated due to concerns about high OHV use, excessive route densities, and subsequent impacts to natural resources. The EIS acknowledged that most of the roads had not been properly closed following decades of timber harvesting, and that subsequent OHV use had been allowed to increase over the course of many years; however, it had reached a point that the route densities, impacts, and user conflicts became unacceptable, so the Forest Service determined it was time to restrict use and restore the environment. The EIS categorically proposed to close motorized routes to meet this purpose (USDA, 2003).

While the Forest Service was correct that OHV use in the Duck Creek-Swains area needed to be better managed, at first the agency was not sensitive about its technocratic, biocentric approach to the project, nor was it sensitive to the controversy the project would generate from OHV users and local government officials. Agency recreation specialists assigned to the project were also concerned about handling public fallout, non-compliance and displacing OHV use to other, lesser-used areas, but these concerns were largely not acted upon until the controversy had already occurred. Not too late, the agency made an effort to better collaborate with stakeholders, and the project was redeemed. The Dixie learned the value of meaningful public involvement and began to incorporate it into the early stages of its projects. Ultimately, the Dixie embraced collaboration as a regular course of doing business, making a significant difference in building relationships for ongoing motorized travel planning and management (Carter, 2004, Carter and Meier, 2005).
**Unintended Consequences of the “Default Approach”**

Conventional thinking initially led managers on the Dixie to assume that use limits were needed in order to address environmental impacts caused by motorized recreation in the Duck Creek-Swains area. In fact, policy required that they do so, as the Dixie’s 1986 forest plan had set a limitation on route density for the forest. Policy and law directs the Forest Service to be consistent with a unit’s forest plan, amending or revising it as needed, through the implementation of site-specific projects (USDA, 1986). The Forest Service therefore focused on limiting open motorized route density to no more than two miles per square mile in order to meet forest plan direction, with the intended purpose of restoring wildlife hiding cover and improving hydrologic conditions (USDA, 2002).

Reversing this condition would prove difficult however, because the density of motorized routes in the area had already exceeded the forest plan guideline over the course of many years. Whether created by recreational users or by the agency for timber sales or other purposes, the high route density was already well-established. It was not until use levels jumped abruptly with local population growth, coinciding with an associated OHV boom, that the motorized route density rapidly became a serious concern. Additionally, the expansive network of routes was not well-signed or mapped, so OHV riders were travelling off-trail, pioneering new routes to make connections between other routes and from their private property onto public lands. Although route density should not have been allowed to exceed forest plan requirements, returning the density to forest plan levels as a proxy for dealing with other problems felt disingenuous and arbitrary to some stakeholders, especially given that many of the routes had been
created in the course of the agency’s past timber harvesting activities (Carter and Meier, 2005).

Although the Duck Creek-Swains EIS did not seek to set a limit to the number of OHV riders that would be allowed to use the area, a carrying capacity approach became manifest in the proposed action to restrict motorized routes back to two miles per square mile. Reacting to perceived impacts by setting use limits has long been a “default” approach in addressing recreation problems, but it can be deceptive in its effectiveness and it may not actually address the real problem. McCool and Cole (1997) tell us that once a “magic number” (capacity) is set, managers tend to feel that their actions will be successful on the ground and defensible in court, regardless of whether the number was derived from a genuine understanding of conditions, trends in those conditions, and the management actions needed to keep conditions within acceptable limits of change. Managers also tend to focus on high-use areas as those most needing use limits. While this seems intuitively appropriate, it may be exactly the opposite of how recreational use capacities should be applied (Cole, 1997).

A generalized recreation use-impact curve (Figure 8) illustrates the danger in this tendency. The curve shows how incremental impacts of new visitors to low-use areas tends to be high, but in moderate and high-use areas, the incremental impact of each additional visitor is very low and eventually becomes negligible (Cole, 1997). Although this recreation impact curve was developed through research on non-motorized recreation, primarily in wilderness settings, it seems applicable to OHV management.
Further research suggests that restrictive actions in high-use areas are likely to result in displacing users to areas of lower-use, creating the problem over and over again, therefore exacerbating ecological and social problems in the broader landscape (Blahna and Reiter, 2001). The displacement of OHV riders from high-use to low-use areas may actually 1) increase perceptions of crowding in low-use areas; 2) not reduce perceptions of crowding in already heavily-used areas; 3) increase ecological impacts in low-use areas; 4) increase the difficulty and expense of correcting ecological and social impacts in areas where new use occurs (Blahna and Reiter, 2001). These would seem to be undesirable results after such an investment in planning time and limited agency resources.

Figure 8: A generalized impact curve showing that the incremental impact of each new visitor in low-use areas tends to be high. Once use elevates to moderate or high however, the incremental impact of each additional visitor is very low and eventually becomes negligible. Source: David N. Cole.
The “default approach” can be described as such: managers allow or even encourage use to occur in an area, but at some point the use and impacts become unacceptable, so managers then attempt to identify a capacity or move directly to restricting use in the affected area. Restrictive actions, intended to be “corrective”, are often pressed by specialists who are concerned about impacts to natural resources, disturbance, and degradation of habitat, which seems intuitive. Restrictions may be seen as necessary by managers and line officers to deal with perceived crowding, conflict, or ecological impacts occurring in high-use settings. This reflects the standpoint that increasing use equates to increasing impacts. The problem here is that this perception may not be shared by the users, often leading to a strong negative reaction toward the land management agency. By reacting automatically with use restrictions, an agency risks alienating stakeholders and dispersing the impactive use to other areas, ultimately not resolving localized problems and potentially expanding them.

There are several possible reasons behind the “default approach”. Forest Service employees may have attitudes and perceptions about recreation and related impacts that differ from those of recreating visitors, and may be operating on assumptions that will not bring about the desired results. Some managers may lack exposure to the social sciences, therefore not giving enough attention to alternative management approaches and misunderstanding the complex problems that they encounter. Some managers hold negative attitudes toward the public. Others may simply not be paying adequate attention to recreation, looking upon it as subordinate to the “more important” purposes of the National Forest, such as commodity production or maintaining or improving biodiversity. Another reason concerns the legal arena. Although this may be improving,
environmental advocates can use appeals and litigation to burden the agency with inordinately detailed analyses, expense, requiring a procedural orientation that often distracts employees away from other more effective, less expensive approaches to recreation management. Last but not least, the Forest Service faces a number of internal challenges that diminish the agency’s capacity and ability get at the true heart of problems. These issues make it harder to judge situations and to choose the right tool to do the job.

In the case of the Duck Creek-Swains EIS, the Dixie National Forest realized quickly that its default approach was taking it toward the consequences described above, and instead it chose collaboration as an alternative approach. While the Dixie case is only a small example, it provides a generalizable model for the default approach often taken by the Forest Service. The next chapter provides a historical context for how the default approach developed within the agency, and the lessons that were learned for making recreation, roads and natural resources management more sustainable.
“In my 37 years with the Forest Service, I have seen a tremendous growth in the amount of recreation on the national forests. Last year, we had 214 million visitors, which is just phenomenal. And it’s only going to keep on growing—we expect it to more than double by the end of the century.

OHVs are a great way to experience the outdoors, and only a tiny fraction of the users leave lasting traces by going cross-country. But the number of people who own OHVs has just exploded in recent years. In 2000, it reached almost 36 million. Even a tiny percentage of impact from all those millions of users is still a lot of impact.”

Forest Service Chief Dale Bosworth (Bosworth 2003)

In his 2003 Earth Day speech, the Chief of the United States Forest Service identified “unmanaged recreation” as one of the Four Threats to ecosystem health and quality of recreation experiences. While “unmanaged recreation” may therefore seem a contemporary subject, it is actually a new name for an old problem. It begs the question, “what then, is managed recreation?” Does “managed recreation” mean that the Forest Service should accommodate increasing numbers of visitors by developing more designed and engineered recreation facilities? Should the Forest Service restrict types of use only to certain areas? Should managers place limits on the number of people that may use an area, or limit the type of use? For over a century, the Forest Service has employed each of these approaches and grappled with new problems generated in the attempt.
With this kind of complexity, it is not easy to choose the right tool for the job. National Forests are vast landscapes with numerous, uncontrolled points of recreational access, offering many choices and relatively few rules that need to be followed. National Forests are neither managed as National Parks with gated entrances, nor as long, one-way river corridors, where visitor numbers and behavior could be more strictly controlled and contained. National Forests are generally open landscapes; places where people can experience a great deal of freedom that is considered a birthright by many in the United States, and enviable to others around the world.

The following provides a historical overview of recreation management on National Forest lands, broken out by eras of Forest Service agency history. This describes historical management challenges faced by the Forest Service, and illustrates the reasons that the agency organized the way it has. We explore several norms and other influences on the agency that may be steering management away from more proactive approaches that would be more socially, economically, and ecologically sustainable.
Guardians of the Forest—The Custodial Era of the Forest Service

After decades of scientists and advocates voicing concerns about depleting forest resources, federal forestry began under the USDA in 1876 with the appointment of Franklin Benjamin Hough to the position of special forestry agent. Hough was the first federal expert on forestry whose duty it was to “investigate the forest and lumbering situation in the U.S.” (USDA, 2011a). Hough eventually served as Chief of the Division of Forestry, which was created in 1881. Borne of a period of reform known as the “Progressive Era”, the purpose of the Division of Forestry, as described by third Chief Bernhard E. Fernow in the 1897 USDA Yearbook, was to educate the public about improved forest management practices. The Division promoted tree planting in non-forested or deforested areas in order to provide for shade, soil loss, and water protection (USDA 1898a). Additionally, the Division sought to improve ignorance of the value, properties and uses of various wood species in order to prevent the waste of wood products on inefficient and improper uses, as well as improving durability and therefore the safety of wood-constructed buildings. The Division of Forestry report in the 1897 Yearbook linked forestry to farming and stressed the need for more conservative use of forest resources. This report also described the pending transfer of the newly formed Forest Reserves to the U.S. Department of Agriculture (USDA).

The first Chief of the Forest Service was Gifford Pinchot, although he actually had been the USDA Chief of the Division of Forestry since 1898, and in the previous year, he had been appointed special agent of the USDI General Land office. As a passionate advocate of federal forestry, Pinchot felt that the forest reserves needed to be managed by
forestry experts within the USDA, and he worked diligently toward that end. His goal was realized with the Transfer Act of 1905, when the management of forest reserves was transferred from the General Land Office of the USDI to the Bureau of Forestry. The Division of Forestry became known as the U.S. Forest Service.

Pinchot provided a strong hand in guiding the fledgling organization toward the utilitarian philosophy of the "greatest good for the greatest number"; later adding the phrase "in the long run" to emphasize that forest management consists of long-term decisions (USDA, 2011a). Pinchot’s close friend was President Theodore Roosevelt, who ensured the creation of the Forest Service. Under his administration the National Forests grew; in 1905 the forest reserves numbered 60 units covering 56 million acres, but by 1910 there were 150 national forests covering 172 million acres. A system for effective organization and management was developed during Pinchot's administration. "Conservation" of natural resources, the idea that Pinchot popularized, became a widely known concept and an accepted national goal (USDA, 2011a).

In the first years, the agency’s highest priority was to survey land boundaries, build ranger stations and hire men for managing the ground. This period is commonly referred to as the “custodial period” of the Forest Service. Reflective of this purpose, in his 1905 “Use Book”, Chief Pinchot identified the purpose of the agency as being “the preservation of a perpetual supply of timber, preventing the destruction of forest cover which regulates the flow of streams, and protecting local residents from unfair competition in the use of forest and range” (USDA, 1905). Regulated public uses of the National Forest Reserves were centered on consumptive human uses including logging of timber, livestock grazing, water usage, and mineral extraction (Figure 10). Other than the
protection of big game, recreation was not at all mentioned in the original Use Book of 1905. Recreational uses, aside from hunting, were clearly seen as peripheral, and did not come to be a primary use of the National Forests until many years later.

Five years after the establishment of the Forest Service, the 1910 USDA Yearbook included a more comprehensive set of reports from the Forest Service, as well as a report from the Office of Public Roads, which sheds some light on the state of transportation in 1910 America (USDA, 1911a). The report revealed a history of road construction and maintenance in the United States, originating as a very limited network of isolated road systems that radiated from communities out into the countryside. The engineering and conditions of these early roads were dependent on available skills and the support of local tax revenues, which had been profoundly set back by the turmoil of the Civil War. Only a few roads actually connected communities to each other. These were improved dirt roads that were referred to as “highways”, but these were much different than we envision by that name in our modern time.

The Office of Public Roads report also cited a 1904 Road Census, stating that there were 2,151,000 miles of public roads in the United States, only 7% of which were described as “improved”. The 1910 report described a trend of moving away from local construction, maintenance and taxes toward a road system that would be administered through the states, under centralized and qualified engineering staffs, therefore resulting in greater efficiency and quality in construction and maintenance (USDA, 1910). A state engineer and staff would be responsible for preparing plans, specifications and estimates, and if funds were available and if the plans were approved by a county board of supervisors, the state would award a contract and supervise the work. A system of trunk-
line highways was identified as part of this progressive reform program, necessary for moving commodities and connecting communities. Thirty-one states were listed in the 1910 report as receiving this federal “State Aid” for roads management (USDA, 1910).

In the same 1910 Yearbook was a report by future Chief F.A. Silcox, at that time serving as Associate District (Regional) Forester, on the topic of “Fire Prevention and Control on the National Forests” (USDA, 1911b). His report centered on the devastating 1910 fires, the causes, and the prevention programs that would be implemented by the Forest Service as a result. Among the several causes of the fires was lack of care by campers, providing a glimpse of recreational uses that were occurring on National Forests at that time. As stated in the 1910 report, approximately 407,000 people were visiting National Forests for recreation each year, staying out a week or two to hunt or fish and to enjoy the “outdoor life”. A 1910 Harper's Weekly article reported on recreation in the National Forests, and noted that there was a concentration of activity and attention occurring in the West and Southwest. Harper’s also identified approximately 406,775 visitors coming to the National Forests in 1909, proclaiming that National Forests were "fast becoming great national playgrounds for the people" (Harper’s Weekly, 1910). The United States resident population in 1910 was 92,407,000 (US Census Bureau, 1975).

In 1916, the first Forest Service campground was constructed at a place called Eagle Creek, along Oregon’s Columbia River Gorge. In 1917 Frank A. Waugh, one the foremost landscape architects in the nation’s history, was hired to conduct a field investigation of the recreational values of National Forests. He began by inventorying recreational resources and activities in campgrounds, picnic areas, and summer homes, and subsequently developed plans for new facilities, including hotels and cabins, that
would accommodate thousands of visitors per day, in relative comfort. Waugh also attempted to place an economic value on outdoor recreation, calculating that National Forest recreation alone was worth $3 million annually, a value much greater than its management costs at that time. Waugh’s recommendations were presented in the booklet “Recreation Uses on the National Forests”, published by the Government Printing Office in 1918. This was the first official Forest Service study of recreation, and although recreation would finally be recognized as a major use of National Forests, it would not be appropriated its own funding until 1922 (Brockman, 1958; Lewis, 2005).

This rush toward recreational development did not sit well with all Forest Service managers. In 1919, the Forest Service hired Arthur Carhart as its first full-time landscape architect. One of Carhart’s first assignments was to survey Trappers Lake in the White River National Forest in Colorado, and to plan the development of home sites along its lakeshore. Carhart completed his assignment, but recommended to that no development should actually be permitted along the lakeshore. Instead, he felt that the best use of the area was wilderness recreation. Ultimately, his superiors agreed with his advice, and in 1920 Trappers Lake was designated as an area to be kept roadless and undeveloped, remaining so to this day (Arthur Carhart Center, 2013). Carhart’s perspective was shared by another Forest Service employee who became a significant figure in conservation and the wilderness movement: Aldo Leopold. The ideas of these two men led in large part to the creation of set-aside wilderness areas, secured later under the Wilderness Act of 1964 (Lewis, 2005).

The miles of roads penetrating the National Forests multiplied as the advent of the automobile expanded recreational access. In 1900, Americans owned about 8,000
automobiles. Only forty years later, Americans owned 40 million autos, and by the year 2000, there were more than 200 million registered automobiles in the United States (Havlik, 2002). In 1912, only a dozen motorists managed to drive across the country, not an easy accomplishment, given the earlier description of the nation’s road network, and that there were essentially no repair shops or gas stations existing at that time. However, by 1921, transcontinental motor trips were already numbering 20,000 (Havlik, 2002). Throughout the 1920s, motorized travelers had so overwhelmed roadsides and private lands that tourists were spilling onto the National Forests. Furthering the promotion of automobile vacations, a group of celebrities including Thomas Edison and Henry Ford went on a number of well-publicized motor camping trips, even joined by U.S. presidents Warren G. Harding in 1921 and Calvin Coolidge in 1923 (Lewis, 1972, 2013). When he called the National Conference on Outdoor Recreation into session on May 22, 1924, President Coolidge referred to recreation as a developing social phenomenon and a major "new" use of the National Forests (USDA, 1993).

The great and deadly fires of 1910 and the 1930s further presented the Forest Service with a reason to develop more roads to deliver men and equipment to remote areas of the forest, allowing the agency to quickly attack fires while they were small and manageable. The twin disasters of the Great Depression and Dust Bowl led to the creation of the Civilian Conservation Corps (CCC), which by 1933 put 275,000 young men to work on the National Forests restoring landscapes, planting trees, constructing recreation facilities, and developing over 100,000 miles of roads and trails for the purposes of accessing wildfires, forest projects and public recreation sites. The impact of the CCCs resulted in a major shift in the agency’s priorities and purpose (Cohen, 2008).
The rate of increasing recreation concerned many managers who felt that the use was exceeding the capacity of natural resources to recover from human impacts. In 1935, pathologist E.P. Meinecke corresponded with his supervisor, urging attention to his concerns about the growing impacts of public camping (Meinecke, 1935). Specifically, he saw that more people were coming to the National Forests with large trailers in tow. He complained that people were inappropriately bringing with them all the comforts of their city homes to the forest. Forest recreation was transitioning from largely male-dominated hunting and fishing trips, where primitive “roughing it” had been the norm, to family-style camping that involved more comforts and more gear. In Meinecke’s opinion, this did not qualify as “camping”.

In his correspondence, now known as “The Trailer Menace”, he described these “house trailers” as being too large for developed campgrounds and causing damage to vegetation. Because these trailers came with so many conveniences, people were able to stay in the forest for longer periods of time, increasing impacts and detracting from the aesthetics of the natural setting. Meinecke warned that the Forest Service was at a crossroad and should bar the over-sized trailers from the National Forests altogether, or forever be faced with accommodating the evolving demands of recreationists. Indeed, as timber production picked up during and after WWII, greater numbers of recreationists, with all their amenities, entered the National Forests upon the expanding network of logging roads. From a relative perspective, Meinecke’s concerns may seem exaggerated when compared with what would come, but his words illustrate the effect of incrementally, sometimes dramatically, increasing recreation uses in previously undisturbed or lesser-used landscapes.
Increasing Demand--The Management Era

Until 1940, 98% of the timber cut in the United States was coming from private lands, but by the 1950’s, National Forests were providing a third of the nation’s timber cut (Steen, 2004). The Forest Service was entering into its production heyday and the engineered improvements being developed on the land were impressive and profound. In the 1958 USDA Yearbook, Assistant Chief Edward P. Cliff reported that each National Forest’s staff now included one or more engineers who oversaw the construction and maintenance of roads (USDA, 1958). According to the 1958 report, the transportation system on National Forests alone consisted of 24,250 miles of designated highways, 124,000 miles of development roads, 116,000 miles of horse and foot trails, and 190 airstrips. Assistant Chief Cliff explained that thousands of miles of additional access roads would need to be built, in conjunction with rebuilding former “truck trails”, in order to move logs, lumber and other forest products to meet growing domestic market demands. Thousands of miles of “branch roads” would also be needed to supplement the primary system to provide ready access for combating insect infestations and diseases, and salvaging merchantable timber damaged by wind-throw or fires. More roads were needed for trucking livestock to and from summer ranges. Even improved wildlife management was dependent on more roads, at that time intended to encourage better distribution of hunters. More and better roads would also be necessary to make mountain lakes and streams more accessible to the recreating public (USDA, 1958).

Assistant Chief Cliff stated that 18 million people had visited the National Forests in 1946, and that the numbers had soared to 52.5 million visits by 1956 (USDA, 1958).
With the National Forest road system providing greater access, recreational use increased from 27 million to 178 million recreation visitor-days per year between 1950 and 1971 (Lewis, 2005). The National Forests had 4,900 developed recreation facilities; most of which were constructed during the CCC era of the 1930s. Recreational use since WWII had increased beyond anyone’s expectations, and the developments from the 1930s were viewed as inadequate to meet growing demand (USDA, 1958).

The country was in a stage of growth and therefore, focus was turned toward meeting increasing demand for outdoor recreation. The late 1950’s marked a lengthy period of emphasis on outdoor recreation. In 1958, the Forest Service announced a new program called “Operation Outdoors”, designed to address the boom in outdoor recreation and to compete with the Park Service’s popular “Mission 66” program (Lewis, 2005; USDA, 1958). The goal of Operation Outdoors was to provide adequate sanitation and care at all National Forest public recreation areas, rehabilitate existing recreation facilities so that they would be safe and usable for the public, and to develop new areas in order to alleviate overuse and accommodate the future use that was anticipated to increase. The program was planned for completion by 1962. Under this program, numerous improvements for camping and picnicking were constructed, and qualified private entities (operating under special use permits) were encouraged to install and operate resorts, lodges and ski lifts. Eighty-one wilderness and primitive areas were also designated where roads and mechanized travel would be prohibited (USDA, 1958).

Also in 1958, the need for more recreation opportunities and facilities was officially recognized when Congress established the national Outdoor Recreation Resources Review Commission (ORRRC). The ORRRC was asked to assemble an inventory and
evaluation of the nation's outdoor recreational resources. Its purpose was to assess the current condition of facilities and future needs for the remainder of the 20th century (USDA, 1997). A resulting Nationwide Recreation Survey (NRS) began in 1960, with five additional surveys conducted in 1965, 1970, 1972, 1977, and 1982-83 (USDA, 2012b). This was the most comprehensive outdoor recreation study ever undertaken in the United States or the world, resulting in a series of acts of Congress, creating the National Wilderness Preservation System, the National Wild and Scenic Rivers System, the National Trails System, a system of National Recreation Areas, and the Land and Water Conservation Fund (Cordell, 2008a; Zinser, 1995).

A significant action resulting from the ORRRC was the creation of the Bureau of Outdoor Recreation (BOR) under the Department of Interior on April 2, 1962 (Zinser, 1995). The BOR was the first federal agency to focus on outdoor recreation, and was the first to carry the word “recreation” in its title. The BOR had no land under its jurisdiction. Its purpose was to coordinate federal recreation programs, stimulate assistance to states for outdoor recreation, sponsor research, encourage interstate cooperation, conduct surveys of recreational resources, formulate a nationwide outdoor recreation plan, and manage the Land and Water Conservation Fund (LWCF). In 1978, Interior Secretary Cecil Andrus replaced the BOR with the Heritage Conservation and Recreation Service (HCRS), transferring certain responsibilities from the BOR over to the National Park Service (NPS). The HCRS, in turn, was abolished by Ronald Reagan in 1981. Most of the programs of the HCRS were transferred to the NPS, but the staff was never again adequate to equal the accomplishments of the BOR or the HCRS (Zinser, 1995).
The ORRRC recommendations included the first nationwide outdoor recreation plan *Outdoor Recreation: A Legacy for America* released in 1973, which identified the current and foreseeable availability of outdoor recreation resources and recommended actions for government and private interests. The ORRRC also established an open space development program, which supported the establishment of the National Wilderness Preservation System in 1964 and expansion of the National Park System. The ORRRC encouraged public interest in national recreation planning and promoted action toward that goal. Few federal commissions have had the impact of the ORRRC, directly affecting the way Americans spend their leisure time (Zinser, 1995).

Twenty years after the release of the ORRRC’s reports, the commission’s chair, Laurance Rockefeller, convened a group of conservation and recreation leaders known as the Policy Review Group, to reexamine the issues raised in the original report. The group found that outdoor recreation was more important than ever in American life, but the integrity of the country’s recreational infrastructure was threatened. The group was unable to persuade Congress to enact a comprehensive appraisal of the nation’s recreation policy and resources, but did capture President Reagan’s interest. On January 28, 1985, the President issued an Executive Order establishing the President’s Commission on Americans Outdoors. A final report was presented to President Reagan on January 28, 1987, making recommendations toward the problems and opportunities the report documented (Zinser, 1995).

The report explored the importance of outdoor recreation, increasing population, changing demographics and preferences of the public, concerns over the availability of outdoor recreation opportunities, as well as the condition of the environment. The
commission identified future trends, issues and solutions toward a future course of action. While the commission attempted to restore the importance of outdoor recreation elevated by the ORRRC in the 1960s, the budget cuts of the 1980s seriously curtailed recreational resource development. Zinser reflected that the “prairie fire” the ORRRC had hoped to ignite with its recommendations was only mildly smoldering as of his writing in 1994 (Zinser, 1995).

Over the years, more studies were conducted and reports issued, including the 1982-83 National Recreation Survey (NRS), the 2004 “Outdoor Recreation for the 21st Century”, by Cordell et al., the 1994-95 update to the 1982-83 NRS, which was conducted as the National Survey on Recreation and the Environment (NSRE), the name under which the survey continues today (Cordell, 2008a; USDA, 2012b). The most noticeable change displayed by the NSRE surveys is growth in the proportion of the total population that participated in outdoor recreation activities. Between 2000 and 2007, the total number of people participating in nature-based outdoor recreation activities grew from an estimated 197 million to 203 million (3.1 percent), and the number of days of participation summed across all participants increased from 41 billion to 55 billion, (approximately 32 percent). Among the fastest-growing activities were those that involved viewing, photographing, identifying, visiting, or otherwise observing elements of nature (plants, wildlife, natural scenery, nature exhibits). The growth in viewing plants and natural scenery (78%) and photographing the same (60%) were the most rapid. Driving OHVs ranked third, with 56% growth between 2000 and 2007 (Cordell, 2008a).

Another survey, called the National Visitor Use Monitoring (NVUM), provided science-based estimates of the volume and characteristics of recreation visitation specific
to the National Forest lands. The NVUM surveys over 100,000 visitors to National Forest System lands on a cycle of every five years. It provides demographic information about visitors and why they visit the National Forests, how satisfied visitors are with the facilities and services they used, and how much money they spent on their visits. The NVUM showed that satisfaction with recreation experiences on National Forests was very high, showing that 94% of visitors were satisfied with their overall experiences, including over 77% who reported being very satisfied. The initial NVUM occurred from 2000 to 2003, and continues today (USDA, 2010a).

Many things have changed since the first national surveys were conducted during the 1950s and 60s. The recent surveys suggest that Americans’ interest in nature-based recreation is not declining; rather it is quite strong, growing and evolving, although there is some debate on this issue. Cordell (2008a) recommended that professionals should therefore seek to convert the public’s interest in nature into active support for conservation and sustainable management of National Forest lands. Cordell also suggested that passing on an interest in the outdoors to younger generations could contribute to better physical fitness, emotional health, and increased opportunities for persons with disabilities (Cordell, 2008a).

Some factors were identified that raise concerns about a potential decline in participation. The recent spike in gasoline prices could affect the type of outdoor activities that people will choose, potentially reducing travel to further destinations and increasing visitation to public lands closer to home, especially near urban areas (Cordell, 2008a). There is also concern that young people’s attachment to computers, cell phones, television, and other media are leading to a future in which people abandon outdoor
activities. Richard Louv’s 2005 book, *Last Child in the Woods*, speculated that children are becoming more disconnected from nature. Pergams and Zaradic (2008) also speculated that there is a “fundamental and pervasive shift away from nature-based recreation”, although Cordell et al. (2008a) questioned this thinking, instead suggesting that outdoor activity levels and interest in nature have not declined, but they have fluctuated across the generations. Cordell felt that changing technology, fads, health care and personal fitness levels, and many other factors should be used to turn today’s disconnected youth into tomorrow’s connected participants (Cordell et al., 2008b).

The National Forest system is now the largest single supplier of public outdoor recreation in the nation, representing more than two-fifths of all recreational use occurring on federal lands (Zinser, 1995). Today, there are 155 National Forests and 20 National Grasslands, in 44 states, Puerto Rico, and the Virgin Islands, encompassing 192,909,421 acres (USDA, 2012a; Zinser, 1995). There are currently 372,799 miles of National Forests System (NFS) roads, and 155,659 NFS trails (both non-motorized and motorized), and thousands more non-system routes that may, or may not, end up being designated (added) to the system under current travel planning efforts. Inventoried bridges associated with these roads and trails total 12,704 (USDA, 2012a). There are 19,694 developed recreation sites, including campgrounds, picnic areas, interpretive sites, trailheads, rental cabins and boating facilities. Toilet buildings total 17,349 and other recreational buildings number 6,696.

Unfortunately, there is also a growing backlog of deferred maintenance for all these facilities, which is maintenance that is not performed as it is needed or scheduled (Doyle
et al., 2008; USDA, 2012a). The numbers below are deeply concerning (Table 2), displaying the deferred maintenance for the entire NFS infrastructure:

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges</td>
<td>$172</td>
</tr>
<tr>
<td>Buildings (administrative and recreational, including toilets)</td>
<td>$1,038</td>
</tr>
<tr>
<td>Dams</td>
<td>$24</td>
</tr>
<tr>
<td>Fences</td>
<td>$297</td>
</tr>
<tr>
<td>Handling Facilities</td>
<td>$22</td>
</tr>
<tr>
<td>Heritage</td>
<td>$26</td>
</tr>
<tr>
<td>Minor Constructed Features</td>
<td>$116</td>
</tr>
<tr>
<td>Roads</td>
<td>$3,107</td>
</tr>
<tr>
<td>Trails</td>
<td>$296</td>
</tr>
<tr>
<td>Trail Bridges</td>
<td>$11</td>
</tr>
<tr>
<td>Wastewater Systems</td>
<td>$37</td>
</tr>
<tr>
<td>Water Systems</td>
<td>$117</td>
</tr>
<tr>
<td>Wildlife, Fish and TES</td>
<td>$7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$5,270</strong></td>
</tr>
</tbody>
</table>


It is difficult to imagine the agency ever catching up with this amount of deferred maintenance, the result being a further deterioration of infrastructure and performance, increasing repair costs, and decreasing the value of assets. Maintaining this enormous system has proven impossible, especially in the current era of declining budgets, increasing operating costs, and redirecting funding to other agency priorities. Additionally, the Forest Service seems caught between its desire to reconnect people with nature and the conflicting view that nature must be protected from human uses. The implication is that both cannot be accomplished together, a topic of ongoing discussion.
The Search for Solutions--Recreation Research

Government recreation participation surveys were showing inadequate supply to meet growing demand, suggesting that land management agencies should *build, build, build!* Meanwhile, research on impacts to the environment and recreation experiences was being generated that would ultimately confuse that message. The research that resulted would develop a great deal of usable knowledge about recreation, but it would not provide managers with a clear cut course of action based that was hoped.

Research on natural resources largely began with the passage of the Morrill Act and the creation of the Department of Agriculture, both of which occurred under President Lincoln in 1862. The Morrill Act established the land-grant college system, which was heavily focused on agriculture and the mechanical arts, reflecting those important needs of the day. By 1897, there were 64 colleges supported by the Morrill Act (USDA, 1898b). Most of these schools focused on food-related agriculture, but over time, forestry and range sciences achieved prevalence as well.

Agency research laboratories came on the scene in 1910, when the Forest Service struck a cooperative agreement with the University of Wisconsin to establish the Forest Products Lab at Madison (West, 1989). By the 1920s, the Forest Service had a cadre of twelve regional stations with field “experimental” stations. Formally enacted by the McSweeney-McNary Research Act on May 22, 1928, these stations generally focused on forestry, range, fire behavior, and the needs of the timber industry. The Act legitimized the experimental stations, authorized forest research on a broader scale than before, and provided for budget appropriations (West, 1989).
Research funding generally slowed during the Great Depression and World War II, causing many programs to be shelved, although forest products research expanded due to the utility of wood in the war effort. By the 1950s, research funding picked up again and the agency sought to improve the quality of its research by offering educational opportunities to its employees. The Government Employees Training Act of 1958 sent nearly ten percent of agency scientists back to school for graduate-level training. The number grew to 20 percent in 1967 but fell to five percent in 1974, because by that time nearly 75 percent of professional research employees had already obtained advanced degrees (West, 1989). As for research on recreation, the increased interest in outdoor recreation and management resulted in increasing recreation research. In 1960, recreation research was finally given a line item of its own in the federal budget allocation (West, 1989).

Harry W. Camp was appointed as the first head of Forest Service recreation research in 1959. Camp felt that the previous lack of trained researchers and poor support by administrators had limited most research only to biological and physical concerns. As a consequence, recreation researchers were feeling somewhat insecure, and began concentrating their methods toward gaining credibility through recreation natural resource studies, such as studying impacts to soils and vegetation in campgrounds (Camp, 1983; West, 1989).

One of the most important pieces of recreation research came in 1964 from J. Alan Wagar, concerning over-use and motivating a scientific focus on recreational carrying capacity. Wagar (1964) cited articles by Meinecke and Leopold from the 1930s lamenting the loss of certain recreation values. Wagar explained that actual recreation
use was now increasing at a rate that far exceeded the plans and developments of the “Mission 66” program of the National Park Service, and the similar “Operation Outdoors” program of the Forest Service. Having written about it in 1946, Wagar’s view was that resource managers were already accustomed to thinking of sustained-yield management in the context of allowable timber harvests and numbers of livestock on rangelands, and the same ideas could be applied toward recreation planning and management.

Wagar, envisioned management procedures that could allow both high-quality recreation along with high rates of use, as long as the procedures: 1) reduce conflicts between competing uses, 2) reduce the destructiveness of people, 3) increase the durability of areas, or 4) provide increased opportunities for enjoyment. Such management would raise the carrying capacity to a level that is consistent with a chosen level of recreational quality. The techniques required would include zoning of uses, engineering, persuasion, interpretation, and the management of biotic communities (Wagar, 1964).

Wagar felt that with proper, site-specific research of both the social and biophysical aspects, managers could define a carrying capacity and thereby set use limits. Managers would therefore need to understand how visitor satisfaction, which determines the quality of recreation, would change under differing amounts of crowding, considering that individual people have differing tastes in recreation. Wagar believed that controls might be placed in a certain area, over a certain type of recreation; however, they would not necessarily be appropriate for another area (Wagar, 1964).
Wagar’s 1964 work was considered pivotal in the world of outdoor recreation research. As a result, the carrying capacity concept spurred much of the recreation research that occurred over the following years. It was a concept deeply rooted in the tradition of resource management and it held great appeal as a means of solving recreation problems. It was believed that managers could use carrying capacity as a way of defining the kind and amount of use an area could support over a specified time, without causing an unacceptable change to either the physical environment or the recreational experience (Lucas and Stankey, 1974). All that was needed was to determine what constitutes an unacceptable or acceptable change (Frissell and Stankey, 1972).

The carrying capacity concept presented a problem for managers though; while it catered to the desire to limit and control threats to natural resources and recreation experiences, it also ran counter to the principle that benefits are maximized by maximizing output of a product. As a result, the concept was creating confusion, and thus would become the single-most debated issue in applying social science to real-world recreation situations. Most authors studying carrying capacity agreed that no technical solution to the problem was likely to ever be found, and that identifying a carrying capacity was dependent on the context of human values and subjective evaluations of desirable conditions. Although these could be empirically researched, to apply the findings toward determinations of a carrying capacity would be extremely difficult to do (Schreyer, 1984).

By 1974, Wagar was expressing concerns that the carrying capacity concept was being misused as a justification for limiting use to protect high-quality recreation and
unique attractions. He felt that attempts to identify carrying capacities had diverted attention from other more promising approaches to managing recreation. It seemed to Wagar that studying the physical concepts of carrying capacity was proving less useful because outdoor recreation is primarily a psychological experience that is dependent on a person's expectations, belief systems and prior experiences. Because the process necessary to understanding these psychological experiences would be so complex, Wagar felt that it made any vision for a carrying capacity formula unrealistic (Wagar, 1974).

Researchers were also differing in opinion as to the purpose, definitions and utility of the carrying capacity concept, and a great deal of energy went into debating those issues. Therefore, the carrying capacity concept continued to be perpetuated at the theoretical level, but it had difficulty in being applied to real situations on the ground. Regardless, the concept bore some weight, as it had been driven by the idea that there are limits on the ability of environments to support human uses, and that ignoring these limits can have many impacts and ultimately decrease the quality of life (Whittaker et al., 2011).

A primary job of managers and researchers is to try to fix problems. It seems reasonable therefore, perhaps intuitive, that use levels should be limited when damage is found to be occurring. Describing exactly what “damage” is can prove difficult however, considering that all human use results in some impact, but all impacts do not necessarily equate to damage. In locations managed to maintain a natural setting, for example, people must accept less than total achievement of that goal if any use is allowed at all. Therefore, attempting to maintain a truly natural setting amid human use is an unrealistic management expectation. For example, even light use of campsites in the Boundary Waters Canoe Area was found to have removed 80% of the immediate ground cover.
Places that are only lightly used are actually those most vulnerable to deterioration of natural conditions, as well as experiential conditions such as opportunities for solitude. Conversely, levels of satisfaction have not been shown to decline in areas already receiving high use. Interpretations of what is “natural” evolve as people continue to use site with higher levels of use (Cole 1997; Frissell and Duncan, 1965; Lucas and Stankey, 1974; Whittaker et al., 2011).

Given that the Forest Service originated when most of the West was still wild and the small amount of recreation that occurred was very primitive, both managerial and recreational preferences may have been channeled toward “unspoiled” experiences (Schreyer, 1984). For many years there has been concern among some researchers that there is a lingering managerial bias toward limiting recreational use. People have often been viewed by managers as being a problem; they are either in the way or causing damage. So accordingly, the purpose of management has been to control the problem of people and to channel human use in ways that would minimize harm to natural resources. For many managers, the first task is to count heads, like numbers of livestock or elk, in order to get a handle on whether or not the use is “too much”. This is a labor-intensive approach, and does not take into account the diversity and evolution of human tastes, or the ability of people to adapt to changing conditions in an environment. Also, in a strange irony, while managers were trying to find ways to control the “people problem”, they were also given a counter-incentive to maximize use to generate participation statistics, in the hope of boosting budget allocations (Schreyer, 1984).

Two perspectives on carrying capacity are illustrated here; the first one centered on the need to determine how many people could utilize an area without destroying its
essential qualities. This emerged from the worry that parks, forests, and other wildlands were being “loved to death”. From this perspective, carrying capacity was viewed as a needed tool for understanding how much and what types of recreation use could be accommodated without impairing important values, ensuring the perpetuation of high quality environments and recreational experiences (Whittaker et al., 2011).

A second perspective equated carrying capacity with a supply-side metric in traditional recreation demand/supply analysis. The national recreation studies during the late 1950s and early 1960s had identified that the supply of recreation resources was not adequate to meet public demand, prompting a desire to increase the national supply of recreation resources. The emphasis here was on identifying the point to which the supply of recreation lands and facilities should be expanded to meet demand (Whittaker et al., 2011).

Wagar had stressed that limiting use at recreation areas should be just one of several means for maintaining recreation opportunities that meet the diverse needs and desires of its visitors. Much research on carrying capacity adopted Wagar’s view that setting use limits was a judgment to be guided by a combination of information about visitors, site capabilities and availability of alternative opportunities. Any decision to limit use would need a sound, transparent, conceptual framework to guide decisions (Wagar, 1974).

Two components were identified as essential to determining a carrying capacity; a descriptive component and an evaluative component (Shelby and Heberlein, 1984; Whittaker et al., 2011). The descriptive component includes the controls that can be imposed by management, the impacts to natural resources or recreational experiences, and the relationship between the two. When managers hold control over the amount of
use in a particular area, such as the number of people, number of vehicles, number of river floats, and so-on, they can then limit use at that level. This usually occurs in instances with a controlled entrance (such as a park), or a facility with a designated number of sites (such as a developed campground), or situations with a permit system in place (such as a controlled river corridor, commercial use, or a permitted wilderness area). Effects caused by differing levels of human use must also be determined in order to understand what happens as a result of allowing more or less use, or by changing other management controls (Shelby and Heberlein, 1984).

The evaluative component requires making value judgments about acceptable levels of impact, and setting evaluative standards (Lime and Stankey, 1971; Shelby and Heberlein, 1984; Stankey, 1978). In order to determine a carrying capacity, it must be understood how use levels and other management actions are affecting vegetation, soil, water quality, wildlife, and the quality of recreation experiences. This requires an evaluative judgment that the impact has exceeded some standard, which determines the maximum level of impacts that are tolerable or most desirable (Shelby and Heberlein, 1984).

Many researchers agree that setting a carrying capacity is just one of many actions that can be taken to manage recreation use (Whittaker et al., 2011). Where use levels cannot be controlled, as is the case with most recreation use occurring on National Forest lands, other management actions must be taken instead to reduce impacts (Stankey, 1978). Managers can take action on unacceptable changes by hardening sites in high-density areas, for example, or by placing use restrictions in lower-use areas, before high levels of impacts have a chance to occur (Blahna, 2007; Blahna and Reiter, 2001; Borrie
et al., 1998; Lucas and Stankey, 1974; McCool and Cole, 2001). Depending on site-specific conditions, other actions may include dispersing users to reduce encounters along a trail or providing education on etiquette and practices to make recreation use less obtrusive. These actions can decrease impacts without decreasing use, and may even allow increased use while impacts remain constant (Becker et al., 1984; Shelby and Heberlein, 1984; Stankey, 1978). Again, what action is proper for one area, or even one trail, is not necessarily correct for another.

A notable offshoot of the carrying capacity research is worth mentioning here because of its importance to the Forest Service. This is the limits of acceptable change concept, or LAC (Frissell and Stankey, 1972; Shelby and Heberlein, 1984). In the United States, the idea of “limits of acceptable change” emerged most strongly in two areas of high-intensity management and protection: wilderness and National Parks. Although the basic framework could be applied to other settings, they are usually applied to these areas because they are managed under a strict set of laws that have resulted in an emphasis on setting carrying capacities (Brunson, 1997; Stankey and McCool, 1984; Stankey et al., 1985).

Wilderness is managed under a non-degradation concept, so managers are directed by law and policy to maintain environmental conditions that equal or exceed minimum standards (generally for the qualities of naturalness and solitude), and for restoration of those conditions when they drop below minimum standards. In order to maintain the qualities required by the Wilderness Act of 1964, many managers have concluded that it is necessary to determine an appropriate level of use (Hendee, 1990; Stankey et al., 1990).
By the 1970’s the National Park Service (NPS) was also questioning its traditional management response of expanding recreational infrastructure in order to accommodate increasing numbers of visitors. As existing facilities deteriorated and budgets for upkeep declined, it became clear that continuing expansion would be unrealistic for that agency as well. Consequently, the NPS sought a planning and management framework that might provide an alternative to this problem. The NPS developed a “limits of acceptable change” process called Visitor Experience and Resource Protection (VERP). The agency has been mandated since 1978 to address carrying capacity as part of each unit’s general management plan.

Deciding which conditions are desirable, how much impact is unacceptable, how use levels affect conditions, and how much use should be accommodated became the focus of limits of acceptable change processes (Whittaker et al., 2011). To answer these questions, researchers recognized the need to define clear management goals and objectives for ecological, cultural, and experiential resources. A number of planning and decision-making frameworks were developed over the years, including the Recreation Opportunity Spectrum (ROS), Limits of Acceptable Change (LAC), Visitor Activity Management Process (VAMP), Carrying Capacity Assessment Process (C-Cap), Visitor Impact Management (VIM), and Visitor Experience and Resource Protection (VERP). Each process had differences in orientation, emphasis and terminology, and specific steps, but all were built on the same foundation of scientific and professional literature, and were similar in their general approach to recreation management (Manning, 2004; Whittaker et al., 2011). Among these decision frameworks, LAC and VERP were the most widely used and studied in the United States.
Most of these frameworks revolved around the idea that there are indicators and standards of quality (Manning, 2004), which may serve as proxies for management objectives. These standards of quality could be used to define the minimum acceptable condition of indicator variables (Hof and Lime, 1997; Krymkowski et al., 2009; McCool and Cole, 1997; Nilsen and Taylor, 1997). The thinking was that instead of focusing on identifying how many people can use an area, the LAC could be used define the desired and appropriate conditions for an area. Once those desired conditions are well-understood and defined, a variety of appropriate management actions can be prescribed to maintain desired conditions. Trade-offs among competing goals would need to be explored and understood. At some point, in some areas, it may become necessary to limit the number of users (McCool and Cole, 1997; Stankey et al., 1990).

If a LAC is used outside of protected areas, more complex objectives and variety of users likely need to be considered. There may be numerous management zones with a variety of uses, some that are opposing in nature, creating a potentially unmanageable situation when the goals are conflicting or at least partially incompatible. Such situations require a compromise between opposing goals, often forcing managers to identify an “ultimately constraining goal” that holds highest priority. The compromise also allows achievement to some degree of an opposing goal, and in the multiple-use setting, several compromises may have to occur between a numbers of opposing goals (Brunson, 1997; Cole and Stankey, 1997).

It is often very difficult to decide which goal is ultimately the more constraining, for example, timber vs. scenery, or to identify the extractive activities that may occur within a recreation setting. In many cases where it has been determined that the recreation
setting or scenery objectives are going to be exceeded, the response has often been to ignore it or adjust the recreation or scenery designation to match the effects of the higher-priority activity. The long-term effect is the same in either case (Brunson, 1997; Cole and Stankey, 1997).

Depending on the multiplicity of goals under consideration and the difficulty in reaching consensus on what the goals should be, a more involved public involvement process may be required, in order to identify concerns and issues pertaining to the area. A LAC can be an adaptive process used to assist in the planning and management. The standards and indicators identified for management zones should fit scientific, economic and social realities, be amenable to measurement under realistic monitoring conditions, and move the management zones toward identified desired conditions (Brunson, 1997).

In developing frameworks and science toward a technical solution, most of the earlier efforts had gone into collecting data about the physical environment, but social information was still lacking. A new focus on the evaluative component began. Two concepts emerged from this research, however, that made it difficult to distinguish impact from evaluation. These were visitor satisfaction and perceived crowding. Like damage to natural resources, these combine impact and evaluation in the same concept. It was presumed that increasing use levels would lead to visitor dissatisfaction, so declining satisfaction could therefore be used to signify that capacity has been reached, with the implication being that more satisfaction is better than less. The assumption was that an area must have too many people when visitors feel crowded; indicating a lowering of satisfaction. It was found however, that not all people react the same way to potential impacts, such as contacts with other visitors, and there are individual variations in
people’s tolerance levels. Satisfaction therefore can be affected in different ways by use levels because visitors may adjust their attitudes and/or behavior in ways that cause satisfaction to remain high under varying levels of density (Becker et al., 1984; Graefe et al., 1984; Shelby and Heberlein, 1984).

Researchers were looking for a cause-and-effect relationship between the amount of use and impacts to a given area. By questioning visitors, it was thought that impacts related to satisfaction or perceived crowding could be empirically determined, and researchers would therefore find relationships to use levels. Effects related to satisfaction or perceived crowding could then be measured along with other impacts, such as damage to vegetation or soil compaction, in order to observe changes at different levels of use. No strong linear relationships were found between use levels and impact measures, such as satisfaction (Becker et al., 1984; Graefe et al., 1984; Shelby and Heberlein, 1984; Stankey and McCool, 1984; Stankey et al., 1990).

Other efforts looked for potential for group standards by measuring individual preferences under a specified set of conditions. It was hoped that agreement might be found among relevant user groups about the type of experience to be provided and the standards by which it could be measured. If users agreed to some extent, a usable standard would theoretically emerge. It was believed that once the relationships between these could be understood, an appropriate capacity could be determined for a given area (Becker et al., 1984; Graefe et al., 1984; Shelby and Heberlein, 1984; Stankey and McCool, 1984; Stankey et al., 1990).

A great deal of focus continued into exploring differences in visitor expectations and norms, toward better understanding these as value judgments that could be translated into
management objectives and standards. The science and resulting body of literature was beneficial to advancing knowledge in recreation research and management. However, for all that has gone into it, a lack of agreement about these concepts has persisted over the years (Becker et al., 1984; Graefe et al., 1984; Shelby and Heberlein, 1984; Stankey and McCool, 1984; Stankey et al., 1990; Whittaker et al., 2011).

The Reality of Wicked Problems

It had been the hope of scientists, managers, and special interest groups that a technical solution would emerge from the science that could provide an objective response to subjective questions. This technical solution could be used to rationally allocate scarce resources, pointing the way toward actions that would otherwise be perceived as discriminatory, arbitrary or capricious. The objective behind finding a social carrying capacity was to provide a scientifically defensible basis for agency actions (Becker et al., 1984).

Natural resources issues were proving to be increasingly complex however, and it concerned some researchers that carrying capacity research would be used to justify management decisions made in the field. Hendee and Stankey (1973) observed that resource managers recognized that social factors affect recreation experiences, but they tended to be less comfortable with limiting use on this basis, instead tending to over-emphasize biological capacity. Burch added a similar concern that there tended to be a focus on the biological, as well as a managerial bias toward control rather than understanding (Burch, 1984).
Burch more pointedly stated that the need for carrying capacity research had come “not from some theoretical demand of social science, but from the ‘real or fantasy concerns of resource managers’”. He questioned whether researchers were primarily interested in understanding the human behavioral dimensions of wildland systems or in providing a rationale to justify management decisions. Burch further contended that the result of such an approach “seems to be organized irresponsibility where managers point to ‘scientific data’ as reason enough for their preferred decisions, and the scientists have the pleasure of both defining and ‘proving’ the value of certain wildland policies held by personally compatible social strata” (Burch 1981; 1984).

Becker et al. felt that the research emanating from the carrying capacity concept had provided a wealth of knowledge concerning the relationships of individuals to their environment, but he doubted that the body of knowledge or the research approach itself would provide a justifiable basis for favoring one group of visitors over others. These authors stressed that even when site damage occurs as a result of excessive use, the response should not be a “knee-jerk” reaction that seeks to reduce visitor numbers (Becker et al., 1984).

Becker et al. further warned against using social carrying capacity to justify excluding one user group over another. A decision to exclude a group because management does not want them there would be seen as discriminatory, arbitrary and capricious without the rationale of social carrying capacity. Even so, the use of a social carrying capacity rationale was seen by these authors to be very thin. In instances when managers may have good reasons for wanting to get rid of a type of use, the reasons are often not sufficiently articulated. Possibilistic planning processes, by their very nature, involve a
great deal of uncertainty. Therefore, managers must clearly define their motives and examine a wide set of options in order to make a decision, utilizing facts as facts and judgments as judgments (Becker et al., 1984).

Burch surmised that carrying capacity research had been promoted to help managers control something they did not understand. To Burch, the carrying capacity issue had come from the 1920s and 1930s, when managers of parks and forests wanted an image of utility, on par with scientific forestry, and so were concentrating upon producing economically-relevant single uses of wildlands. As foresters built roads to better manage the timber, and campgrounds were developed to concentrate visitors, they did not assume that other uses could become as important as their preferred activities, nor did they plan necessary maintenance of recreation sites located along streams, lakes and in alpine meadows (Burch, 1984).

Rather than acknowledging that the roads, trails, campgrounds were placed where they should not have been, especially during the rapid development by the CCC’s, and that there was no capital to maintain those facilities over the long-term, the problem was defined as “too many people loving the wilderness to death”. Most important, according to Burch, was the failure by managers to clearly specify management goals for wildland recreation so that monitoring and evaluation research could measure how well or poorly management was doing in meeting those objectives.

Burch quoted what he felt was the clearest statement of the useful function of this research, made by one of the pioneers of carrying capacity, George Stankey (1979):

“Carrying capacity, in my view, is not a scientific concept, but a management notion. The research role in carrying capacity is describing the social and
ecological consequences of alternative use levels, thus providing the opportunity for managers to judge whether these consequences are consistent with area management objectives. With each change in objective, the acceptable and appropriate social-ecological milieu also changes. Thus, while research can help managers who are concerned with carrying capacity, it cannot supply answers about what the carrying capacity of a site is or should be.”

To Burch, most wildland recreation management seemed to emphasize the negative and concentrated on restrictions, regulations, and other means of controlling the “people problem”, rather than seeking to serve and enhance the people’s enjoyment of their public grounds. One of Burch’s primary criticisms was that wildland management, especially the social aspects of that management, was being done “on the cheap”, lamenting the lack of funding given to the Forest Service and Park Service. He cautioned researchers about “distorting the virtues of science, using its trappings to rectify what are essentially policy choices”. Burch concluded that conventional wisdom about recreational carrying capacity was essentially a series of managerial metaphors which seek to substitute technical processes for difficult political value decisions (Burch, 1984; Becker et al., 1984.

The Forest Service had had a purposeful tradition of conformance to policy and procedures (Kaufman, 1960). The search for technical solutions, both in practice and in research, was consistent with the agency’s motivations to follow a set of ordered, systematic, and efficient procedures. The Forest Service, being a product of the Progressive Reform movement brought about to repair the societal damage done by the Industrial Revolution, was assembled as an efficient, scientific, professional machine
whose work would help propel the country into prosperity. The employees of the agency were selected and molded from the beginning to match this purpose, and to serve as government experts working toward the public good. A natural fit was reductionist linear thinking and diagnostic, step-wise, rational approaches to problem solving (Daniels and Walker, 200; Kaufman, 1960; Norton, 2005; Shindler and Cramer, 1999).

Because of the step-wise orientation, linear processes leave little room for error. The practitioner is expected to get it right first time: gather all the needed data, identify issues, analyze alternatives, decide, and implement. If anything is missed or omitted, the steps must be repeated in another attempt at success. Natural resource problems are very complex, however, and getting it right the first time is practically impossible. Discovery of new information often occurs, well into planning efforts. Natural resource problems are also essentially unique, constantly changing, and subject to multiple, competing human values. Despite years of searching, no deterministic model exists to help managers choose the “right” course of action, consistently, and complexity continues to frustrate managers and the public alike.

Managers face many situations for which “there is no single obviously right answer and the results of individual decisions, each undertaken for arguably sound reasons, interact in unexpected and perplexing ways” (Daniels and Walker, 2001). Rittel and Webber (1973) defined these as “wicked problems” which defy typical disciplinary analyses and confound conventional policy processes. Wicked problems have the following distinguishing properties (Balint, 2006; Norton, 2005; Rittel and Webber, 1973):
1. There is no definitive formulation of the problem; different framings of the problem will lead to different definitions. The information needed to understand the problem depends upon one's idea for solving it. That is to say: in order to describe a wicked problem in sufficient detail, one has to develop an exhaustive inventory of all conceivable solutions ahead of time.

2. Every wicked problem is inextricably linked to other problems; efforts to resolve components of a wicked problem will exacerbate other components of the problem or create new problems.

3. There is no stopping rule, or point at which the problem is effectively resolved. For wicked problems, there are no criteria that determine when the solution has been found. Projects end for considerations that are external to the problem, such as running out of time, or money, or patience.

4. Resolutions to wicked problems are not “true or false,” but rather “good or bad” or “better or worse” or, at best, “good enough.”

5. There is no immediate and no ultimate test of the effectiveness of a solution to a wicked problem. Every solution to a wicked problem is a “one-shot operation”; every implemented solution is consequential, leaving "traces" that cannot be undone or easily corrected after unsatisfactory performance.

6. There are no criteria which enable one to prove that all solutions to a wicked problem have been identified and considered.

7. Every wicked problem is essentially unique; consequently there is no opportunity to learn by trial and error. There are no rules that consistently match wicked
problems. Solutions that might be applied to one are quite incompatible with another.

8. Every wicked problem can be considered to be a symptom of another wicked problem.

9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution.

10. The public gives the planner no flexibility to be wrong.

Many problems in managing public lands can be described by these properties. The thesis of this paper is that the Forest Service is imbued with a historical precedence of finding technical solutions to linear problems, and as a result, the agency struggles to address the highly complex, wicked problems that typify its politicized decision making and policy environment. It is unlikely that research or empirically driven planning frameworks can ever reveal technical solutions to wicked problems. This is because they involve value judgments, and no amount of data will resolve value judgments. Nonetheless, a data-oriented search for recreation carrying capacities occurred over many years, with the hope that data would justify setting use limits. While data was found to be helpful in informing reasonable people, an integration of socio-political processes such as collaboration, is required to resolve wicked problems (Daniels and Walker, 2001; Williams, 2007; Williams and Blahna, 2007).

Again, the effect of attempting to impose capacities has unintended consequences that typically are not assessed, adding to wicked complexity. These include, but are not limited to, displacement of users, spreading of impacts, and fallout by the public. Along
those lines, Blahna (2007) highlighted a recreation carrying capacity paradox; setting use limits may actually exacerbate impacts by displacing users to new areas, homogenizing available experiences, creating conflict and often makes more sense in the places that managers aren’t interested in imposing them, which are low-use, relatively pristine areas (Blahna and Reiter, 2001; Borrie et al., 1998; McCool and Cole, 2001). Blahna added that spending time and political capital trying to set visitor capacities distracts managers from applying more effective management tools like site hardening, visitor education and others (Blahna, 2007). The concerns expressed by Becker et al. and Burch therefore seem quite valid; the priority placed on recreation carrying capacity as a management tool had been misplaced.

The next chapter discusses additional wicked complexity: the evolution in the Forest Service from maintaining and producing resources for utilitarian purposes to a more diverse purpose of ecosystem management, setting the agency on a course to more global involvement and a goal of sustainability.
CHAPTER 3: THE COURSE TOWARD SUSTAINABILITY

First Steps--Multiple Use-Sustained Yield

The Forest Service’s managerial period was a time that brought about tremendous cultural transformation for the nation as well as the agency. In the wake of WWII, private timber resources were dwindling, so the timber industry turned to National Forests to supply the housing boom and other growing consumer markets. The timber industry exerted constant pressure on the agency to raise its annual harvesting limits. While the Forest Service struggled against these powerful interests, the agency had been able to count on the backing of the conservationists. After WWII however, and especially into the 1960s and 1970s, environmentalists and recreationists began to turn their own complaints toward the agency. The environmentalists called for more wilderness areas and sanctuaries for endangered species, from which all harvesting and development and even access roads and airplane landing strips would be excluded. Recreationists hoped to limit logging and grazing as well, but their interests called for increased access for skiers, hunters, anglers, hikers, campers, and other recreational users. Although the two movements were not always in agreement with each other, they were both at odds with the long-established industrial users of the National Forests, and each, in its own way, became a challenge for the Forest Service. The political climate was becoming more complicated (Lewis, 2005; Steen, 2004).

Until 1940, 98% of timber cut in the United States came from private lands, so the public had come to see the National Forests as places where trees were preserved. By the 1950s, however, Forest Service timber harvest was contributing 1/3 of the national
harvest. To people not trained in forestry, logging on National Forest lands was looking the same as it did on private lands, and people were becoming unhappy with what they saw. As the rates of timber harvesting increased into the 1960s, so did membership in organizations that supported preservation of scenery (Steen, 2004).

These interests began to gain in power, resulting in the first multiple-use and wilderness bills being introduced in Congress in 1956. The Multiple Use-Sustained Yield Act became law in 1960 and the Wilderness Act in 1964. The Multiple Use-Sustained Yield Act of 1960 essentially ratified the Forest Service management practices that had evolved up to 1960 (Steen, 2004), and was intended to respond to peacetime demands on natural resources that were matching the intensity of the war years. In general, American civilians were gaining tremendous purchasing power post-WWII (Steen, 1991, 2004), and sustained yield policies therefore focused on supplying timber products for the wants and needs of the American people, especially toward accommodating demand for civilian housing.

Following utilitarian management philosophy, sustained yield emphasized an output of goods and services as objectives for resource management, but it also prohibited overuse of natural resources. This required preventing the overcutting of timber and directing that equal attention and priority be given to other resources of the National Forests (Steen, 2001, 2004). As defined in the Act of 1960, “Sustained yield of the several products and services means the achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land” (USDA, 2011b). Maximum output could be sought, within the limits of the resource to provide that output,
and resources were managed individually toward singular utilitarian objectives. Supply
and demand, and carrying capacity thinking, can be found in Multiple Use Sustained

Although the five multiple uses (outdoor recreation, range, timber, watershed,
wildlife and fish) were to receive a share under sustained yield’s goal of balance, the
resources with the greatest potential to generate revenue tended to be directly and
indirectly favored through the budgetary process. One story goes that the word “outdoor”
had been strategically added to “recreation” by advocates in order to bump it first in the
alphabetical order of the resources, although doing so did not help in elevating it as a
budgetary priority. Recreation did not generate revenue that could compare on any level
to that of timber production (Steen, 2004).

It was a fact that timber returned the most revenue to the treasury, and via
Congressional appropriations and special programs, timber production paid for almost all
the operations under the management of the Forest Service. Timber’s emphasis
continued to dominate targets and the annual budgets appropriated to the agency, and
therefore drove the program of work. By contrast, recreation did not receive much
attention in the budgets and continued to struggle for legitimacy both at national and local
levels. Ironically, recreationists were being encouraged to increase their visitation
through marketing and construction efforts, and therefore more people were using the
forest at a time when timber was heading into peak production. The recreating public
was invited to come to the National Forests in droves, and the agency was exposing to
people the detrimental effects of timber harvesting along the way (Lewis, 2005; Dunsky
Ecosystem Management Emerges

People were growing increasingly intolerant with the direction the agency was heading, despite the agency’s explanations that its decisions were rooted in science, engineering and economics. The economic interests of those who sought the maximum yield of specific resource outputs had become a concentrated power, and they often subjugated concerns of the larger public (Cortner and Moote, 1999). Conservation organizations became anxious over the apparent capture of public land managers by industrial interests, and started intervening in the politics of resource management. Agitated by a number of environmental controversies and political-change efforts such as the anti-war (Vietnam) and civil rights movements, an era of activism was ushered in, resulting in a clash of cultures in American natural resources management. Consequently, several important pieces of legislation came out of this time, including the Wilderness Act of 1964, the National Environmental Policy Act (NEPA) of 1969, and the Clean Air and Water Acts of 1970 and 1972, the Endangered Species Act (ESA) of 1973 and the National Forest Management Act of 1976 (Dunsky and Steinke, 2006; Lewis, 2005; Steen, 1991, 2004; USDA, 2011b).

This string of new legislation compelled the Forest Service to explore other values besides consumptive uses. In particular, the Endangered Species Act (ESA) of 1973, which was a powerful force in the courts, and the National Forest Management Act (NFMA) of 1974, which restricted the size of clearcuts and mandated the maintenance of viable species populations, led to a declaration by Chief Dale Robertson that clearcutting of timber would no longer be a standard practice on National Forests (Stankey et al.,
2006; Steen, 2004). In his interview with Steen (2004), Chief Robertson explained that clearcutting was thought by Congress to have largely ceased with its passage of NFMA, with only a few allowable exceptions. However, the Chief felt that the Forest Service had tended to maximize the exceptions, and clearcutting had actually continued in over the years. Despite this seemingly obstinate attitude, the Forest Service was very much in a transitional period. Although it had not yet eliminated clearcutting, it was developing new concepts in forestry, focusing on addressing endangered species and testing alternative ways of managing the forest and harvesting timber. This concept, first emerging as “New Forestry” and evolving into “New Perspectives”, provided a new and broader way of looking at and managing the National Forests. The New Perspectives pilot tests occurred over several years (Lewis, 2005; Gilmore, 1997; Steen, 2004).

In June of 1992, the U.N. Conference on Environment and Development, known as the “Earth Summit”, was held in Rio de Janerio. The U.S. delegation was led by EPA administrator William Reilly, with whom Chief Robertson enjoyed a positive working relationship. According to Chief Robertson, Reilly would often question him on the subject of clearcutting, to which Robertson recalled that his explanations were not overly convincing. Robertson explained to Reilly that clearcutting, as well as endangered species, would be dealt with through the broader framework of the New Perspectives program, which by then the Forest Service was calling *Ecosystem Management*. Presented with an opportune moment by the “Earth Summit”, Robertson worked with Reilly to finally cement agency policy to severely limit clearcutting. With the purpose of defusing criticism by then-Senator Al Gore in his Earth Summit speech, President George H. W. Bush announced at Rio that clearcutting had ended as standard practice on United
States National Forests, and that it was all part of a new policy called Ecosystem Management. At the same time, Chief Robertson made the announcement at home (Lewis, 2005; Steen, 2004).

Until that time, resource management in the United States had been based on maximizing production of goods and services, regardless of whether these involved number of board feet (commodities) or wilderness recreational visitor days (amenities). Past managers and lawmakers had been careful to speak of “balance” and “sustained yield”, but balance had never actually been defined in any United States environmental law and sustained yield had often been confused with sustainability (Grumbine, 1994).

According to Adams (2006) in a paper further developing the key arguments explored at a meeting of the International Union for Conservation of Nature (IUCN) held in 2006, the idea of sustainability dated back more than 30 years to the mandate adopted by International Union for Conservation of Nature (IUCN) in 1969. Sustainability was also a key theme of the United Nations Conference on the Human Environment in Stockholm in 1972. The concept had been coined at the conference to suggest that it was possible to achieve economic growth and industrialization without necessitating environmental damage. Progressing over the following decades, sustainable development thinking became mainstream through the World Conservation Strategy in 1980, the Brundtland Report in 1987, and the United Nations Conference on Environment and Development in Rio in 1992. Although the definition evolved over decades, the Brundtland Report (United Nations, 1987) is recognized as providing the base definition for sustainable development: “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

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At the United Nations’ World Commission on Environment and Development in 1987, commission chairwoman and Norwegian Prime Minister Gro Harlem Brundtland pressed the urgency of making progress toward economic development that could be sustained without depleting natural resources or harming the environment (United Nations, 1987). The Brundtland Report was considered pivotal in changing sustainable development from a physical notion based on the concept of sustainable yield in forestry and fisheries to a much broader concept that linked economic and ecological policies within an integrated framework. Environmental issues were looked at in a more global, holistic way, where economic and environmental policies could no longer be placed in separate compartments (United Nations, 2007).

The Brundtland Report had laid the groundwork for convening the Earth Summit in Rio de Janeiro that occurred five years later. The June 1992 Rio Summit was the largest environmental conference ever organized, with over 30,000 participants, including more than one hundred heads of state. The summit represented a major step forward in making international agreements on climate change, forests and biodiversity. Among the summit’s outcomes were the Convention on Biological Diversity, the Framework Convention on Climate Change, Principles of Forest Management, the Rio Declaration on Environment and Development, and Agenda 21, which required countries to compose a national strategy of sustainable development. The summit also resulted in the establishment of the UN Commission on Sustainable Development (United Nations, 2007).

Back in the U.S., the Forest Service’s Ecosystem Management was evolving out of three competing value systems: 1) the resource-conservation, or wise-use ethic advocated
by Gifford Pinchot; 2) the romantic-transcendental preservation ethic, advocated by John Muir, and; 3) the ecological-evolutionary land ethic introduced by Aldo Leopold (Callicott, 1990; Gilmore, 1997). Pinchot had advocated that resources be used for the “greatest good for the greatest number of people for the longest time”, while Muir viewed nature as “a temple that could only be sullied by the intervention of people”. Leopold took a different view, regarding people as “citizen members” of natural ecosystems, with both the right and the responsibility to assure the well-being of all other member species (Callicott, 1990). These illustrious figures all played a role in developing ideas about Ecosystem Management.

Ecosystem Management drew upon existing ideas but was truly a fresh approach to United States forest management (Lewis, 2005). The Forest Service presented Ecosystem Management as an alternative to total preservation or total utilization, instead focusing on maintaining complex ecosystems. It accommodated ecological values, while allowing for the extraction of commodities. The Forest Service envisioned Ecosystem Management as an evolutionary step along the continuum from Pinchot’s “greatest good” ethic toward Leopold’s “land ethic” that would protect the productivity of the land, the diversity of the plant and animal gene pool, and the overall integrity of the forest and stream ecosystems, both on commodity and preservation lands (Lewis, 2005).

Ecosystem Management had a fundamental difference from multiple-use: all components of the ecosystem, including people, must be considered as integral parts of the management planning process (Gilmore, 1997). Commodity components of the ecosystem cannot be administered independently, separate and out of the context with the ecosystem as a whole. Under the previous traditional form of management, according to
Cortner and Moote (1999), nature was treated as a collection of resources to be individually manipulated and harvested to meet the needs of the humans in control. Conversely, Ecosystem Management treats nature with reverence and respect for its complexity of connected, interwoven components. Protection of ecosystem attributes and functions, particularly biodiversity, is critical. Unlike traditional resource management, Ecosystem Management doesn’t begin with enumerating outputs.

Gilmore (1997) described the evolution this way: a greater number of individuals and organizations established a stronger voice in natural resource management decisions, leading to an ecologically-based style of management. The shift to ecologically-based resource management came about to address society’s concerns over complex ecological systems having diverse values, as opposed to the previous administrative model that focused on the output of commodities. The further integration of social-based ecosystem philosophy was brought about by the need to reconcile competing economic, ecological and societal values as society continues to evolve.

The production of commodities and amenities was perhaps a futile focus on “competing outputs” (i.e. fiber production, game animals harvested, recreation user days, visual quality objectives), which often could not be provided on the same piece of land anyway. Under the new paradigm of Ecosystem Management, resource managers and scientists would instead integrate and collaborate on resource decisions. Ecosystem Management became distinctive in that it included an internal and public participation process to provide a social context in the decision-making, finding solutions that are ecologically sustainable, economically viable, and socially acceptable. Only in this manner could the collective needs of society be met over the long term (Gilmore, 1997).
This exemplifies the distinction between \textit{sustained yield} and \textit{sustainability} (Cortner and Moote, 1999).

Grumbine (1994) provided additional thoughts on the development of the Ecosystem Management concept, as well as the implications of putting it into practice. According to Grumbine, the primary reasons for the evolution of Ecosystem Management were to address concerns over loss of biodiversity, to provide a process that would effectively slow down environmental deterioration, and to successfully stand up to appeals and litigation by environmental groups. Ecosystem Management also reflected societal views, which had shifted from a focus on extraction and development, to a focus on protection and restoration. In the words of Grumbine, there are ten dominant themes of ecosystem management (1994):

1) Hierarchical Context. Ecosystem Management is a “systems” perspective, where no one level of the biodiversity hierarchy is focused upon. Managers must seek the connections between all levels.

2) Ecological Boundaries. Working across administrative/ political boundaries and working at appropriate scales.

3) Ecological Integrity. Protecting the patterns and processes that maintain biodiversity (e.g. conservation of native species, maintaining natural disturbance regimes, reintroduction of native species and representation of ecosystems across natural ranges of variation, etc.)

4) Data Collection. Ecosystem Management requires more research, data collection, and better use of existing data.
5) Monitoring. Managers must track the results of their actions so that success or failure can be evaluated.

6) Adaptive management. Adaptive management assumes that scientific knowledge is provisional and focuses on management as a learning process, allowing managers to remain flexible and adapt to uncertainty.

7) Interagency Cooperation. Ecosystem Management requires cooperation across land management agencies and private entities, working together to integrate conflicting legal requirements and management objectives.

8) Organizational Change. Changes in the structure of land management agencies and the way they operate.

9) Humans Embedded in Nature. People cannot be separated from nature. Humans are fundamental influences on ecological patterns and processes and in turn are affected by them.

10) Values. Regardless of the role of scientific knowledge, human values play a dominant role in ecosystem management goals.

Grumbine (1994) summarized these ten themes into a single working definition, that “Ecosystem Management integrates scientific knowledge of ecological relationships within a complex socio-political and values framework toward the general goal of protecting native ecosystem integrity over the long term.” Within the goal of sustaining ecological integrity, Grumbine identified five more specific goals (1994):

1) Maintain viable populations of all native species, in situ.

2) Represent, within protected areas, all native ecosystem types across their natural range of variation.
3) Maintain evolutionary and ecological processes (i.e. disturbance regimes, hydrological processes, nutrient cycles, etc.)

4) Manage over periods of time long enough to maintain the evolutionary potential of species and ecosystems.

5) Accommodate human use and occupancy within these constraints.

According to Grumbine, the first four of these goals are value statements, derived from scientific knowledge, that aim to reduce (and eventually eliminate) the biodiversity crisis. The fifth goal acknowledges the vital (if problematic) role that people play in all aspects of the Ecosystem Management debate (Grumbine, 1994).

Cortner and Moote (1999) identify the first priority under Ecosystem Management as being to conserve ecological sustainability, and the levels of commodity and amenity outputs are modified to meet that goal. Cortner and Moote state that under Ecosystem Management, science is viewed as uncertain, evolving, and multidisciplinary, and having no claim on the truth or best answers; a convergence with Grumbine’s sixth theme of adaptive management. Ecosystem Management must necessarily be flexible and adaptive, no longer following rigid protocols. Where decision-making had previously been a top-down prerogative of resource management officials, under Ecosystem Management decision-making became a public, politicized, shared-ownership endeavor, where different interests and values would be openly addressed (Cortner and Moote, 1999). Although the Forest Service was the first federal agency in the United States to adopt Ecosystem Management, the adaptive and collaborative aspects have been a paradigm shift within the agency, still yet to be embraced by some resource managers (Cortner and Moote, 1999; Gilmore, 1997; Thomas, 1996).
The Resurrection of Aldo Leopold

These new concepts in sustainability, collaboration, and adaptive management were founded in the works of Aldo Leopold. Leopold was a forester and conservationist during the early years of the Forest Service, and became a philosopher, educator, and renowned writer. He has been called the father of wildlife conservation, and among the early leaders of the wilderness movement. Leopold is widely regarded as the most influential conservation thinker of the twentieth century (Callicott, 1990, 2000; Leopold, 2011; Lewis, 2005; Meine, 2010; Norton, 2005, 2011).

Aldo Leopold entered the Forest Service in 1909 after completing his education at Yale’s forestry school, and by 1912 he was supervisor of the Carson National Forest in northern New Mexico. Starting out as a follower of Gifford Pinchot’s utilitarian ideology, his perspective on managing forest resources, primarily game species, was one of maximizing yield. While young in his career he focused on habitat management and reducing predator numbers in order to produce a maximized yield of game for hunters. At that time, agencies and preservation groups tended toward actions and policies that focused on saving one species at a time. Leopold began to shift his perspective however, as he delved into the complex relationships of the total system. He began to understand the forest as an ecosystem (Lewis, 2005; Meine, 2010).

During his time in the field, Leopold grew concerned over the expansion of roads and other developments on the National Forests, and the impact these had not only on wildlife but recreation experiences (Lewis, 2005; Meine, 2010). By 1921, Leopold was urging the designation of portions of the Gila National Forest in New Mexico as “a wilderness
hunting ground”, a new idea in recreation management. Leopold was persuasive. In 1924, a portion of the Gila National Forest was designated as the nation’s first wilderness area, setting the foundation for the Wilderness policies and program that would be implemented later in the century (Lewis, 2005; Meine, 2010).

That same year, Leopold left the field to become the associate director of the Forest Products laboratory in Madison, Wisconsin. There, he developed his ideas that effective game management needed to go beyond just control of predators; proper habitat conditions had to be managed. In 1928, Leopold left the Forest Service to conduct several wildlife studies and to write about his ideas and observations. In 1933, he accepted an appointment as the newly-created chair in game management at the University of Wisconsin, and remained in that position until his death in 1948 (Lewis, 2005; Meine, 2010).

In 1935, Leopold purchased a degraded 120-acre farm in the “sand counties” area near the Wisconsin River, where he and his family worked to rehabilitate the land by restoring its ecological balance. These efforts were well documented in the journals he kept, from which he extracted the material used in his books and articles. He wrote about the idea that individuals are part of a “community” that should be considered together, as a whole. This community includes elements such as soils, waters, plants, and animals, or collectively: “the land”. Leopold’s views on ecology, aesthetics, and ethics emerged from his very personal interaction with nature, where he developed a deep awareness, love and respect for the land.

Emerging from European ideas, American perspectives about natural landscapes grew from the romantic and transcendentalist movements of the mid-1800s. These ideas were
promoted through the landscape painting of the artists from the Hudson River School, writers and philosophers such as James Fennimore Cooper, William Cullen Bryant, John Muir, and Henry David Thoreau, and the founder of American landscape architecture, Frederick Law Olmstead. Romantic portrayals of the landscape were not so much illustrating a natural environment as they were a naturalistic, though stylized interpretation of one (Gobster, 1995, 1996, 1999).

Leopold felt that traditional preferences for scenic landscapes placed value only particular features, or places that have special meaning because of their location, history or symbolism. Leopold felt that society needed to move away from these traditional preferences and instead learn to integrate ecological integrity with other values, such as aesthetics. Leopold’s idea for an “ecological aesthetic” encouraged people to look beyond surface qualities in order to gain a deeper understanding of nature and natural processes. By becoming closer, more interactive with the land, people would gain an “appreciation” for it. Through this sense of appreciation, people would come to love, care about, invest in, and work together as a connected community, in cooperation, to conserve and restore broad ecosystems. From this interdependence, people therefore would become stewards of the land, essential to attaining sustainability (Gobster, 1995, 1996, 1999; Gobster and Chenoweth, 1989).

Through his famous book, A Sand County Almanac, as well as in his weekly columns for farmers and other essays to the general public, Leopold tried to reach people with these ideas and experiences. He wanted to enhance their appreciation and ecological understanding, rekindle their love of the land, and inspire in them an ethical obligation to maintain and restore its health and beauty. Leopold summed up his ideas about ecology,
aesthetics, and ethics in his profound but simple moral statement: “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.” His “land ethic” was a major break from attitudes about taming the land that had been so prevalent to that time, and highly influential in setting the stage for the modern conservation movement (Callicott, 1983; Leopold, 2011; Lewis, 2005; Meine, 2010; Waller and Flader, 2011).

Students of Leopold often state that he was a thinker far ahead of his time. He promoted “intelligent tinkering”, “cautious experimentation”, where people were neither pure exploiters nor disconnected observers of the landscape, but workers of the land for its own good, and for the good of people. In his own time, he restored landscapes, both large and small, helped form instrumental organizations (such as the Wilderness Society), and inspired many people with his writing. His ideas also found great resurgence during the environmental awareness of the 1960s and 1970s and beyond, and as a result, A Sand County Almanac has been reprinted several times. Aldo Leopold left a tremendous legacy and his ideas were enduring. He became an inspiration to many working under the new approach of Ecosystem Management, and his influence in modern ideas on sustainability and aesthetics cannot be overstated (Callicott, 1983; Leopold, 2011; Lewis, 2005; Meine, 2010; Waller and Flader, 2011).

**Stewardship and Adaptive Management**

Nassauer (2011) explained that “*care* can be a powerful concept for promoting sustainability because it is a response to what is noticed and noticeable to others, it is a deep, pervasive cultural norm, it can evoke an aesthetic response, and it is a form of
intervention”. She went on to describe *stewardship* as a specific type of care, “invoking broad scales of time or space, and connoting care of something that ultimately belongs to others rather than only to oneself”. Evidence of care and stewardship elicits a response that is not only normative, according to Nassauer, reflecting on the way the landscape should look, given cultural norms, but also aesthetic, eliciting pleasure or displeasure (2011). Nassauer’s own research has consistently suggested that people value the characteristics of landscapes that display care. She refers to such visible evidence as *cues to care*. Evidence of care in the landscape suggests that real people are involved with a place and that they are good neighbors who have personal pride, as well as the resources and ability to take care of things (Nassauer, 1995, 1997, 2011).

Sheppard (2001) also worked with this concept, referring to it as *visible stewardship*. Sheppard pointed out that there can be adverse public reactions to forest management practices, even those that are promoted by ecologists. Sheppard defined the theory of visible stewardship as supplemental to the Leopold’s “ecological aesthetic” where people have an appreciation for the landscape by gaining a deeper understanding of nature and natural processes. For human-modified landscapes, Sheppard explains, people find aesthetic those things that clearly show people’s care for and attachment to a certain landscape. Sheppard stressed that people “like man-modified landscapes that clearly demonstrate respect for nature in a certain place and context” (Sheppard, 2001).

In the words of Sheppard, this idea “emphasizes not whether the landscape looks natural, or orderly, or culturally appropriate, or controlled, so much as it looks as though real individuals care for the land or place: people who are linked to it, rooted in it, invested in it, working in it in a respectful, symbiotic, and continuously vigilant manner,
perhaps even from generation to generation”. Therefore, forest management practices will not be perceived as good if they cannot demonstrate an obvious and sustained commitment of people to the places under their control, a visible show of respect for nature or place (Sheppard, 2001). Despite changes over time, a well-cared for landscape will exhibit signs that well-intentioned people are watching over that change (Nassauer, 1997).

In Sheppard’s view, if visible stewardship is based on real stewardship, not just a superficial appearance of good management, the result will be a sustainable forest as well as a preferred landscape. If sustainability is defined as having long-term stability (although not necessarily a steady-state ecological environment), there should be a strong association between landscapes which sustain communities and those which are preferred aesthetically. This is especially true “where the landscape itself becomes the visible evidence of the success and benefits of stewardship over the long term; a managed environment which is properly-functioning in the ecological sense, but also elicits human responses typically associated with that which is scenic” (Sheppard, 2001).

Gobster (2001) added his idea of appreciation, the visible stewardship of a landscape, where emphasis is placed on greater understanding, measuring, and providing opportunities for people to learn about and appreciate sustainable ecosystems. Under landscape appreciation, society would expand its ideas about landscape beauty, brought about by infusing a deeper collaboration between scientists, philosophers and designers into research and practice (Gobster, 2001).

This discussion, although directed at concepts in landscape aesthetics, gets at the heart of sustainability. In Restoring Nature: Perspectives from the Social Sciences and
*Humanities* (2000), Bruce Hull and David Robertson referred to environmental decision-making as “a tournament of competing conservation agendas in which some values and beliefs are held up and exalted, others are dismissed and ignored, and still others are left implicit and unnoticed”. Stakeholders, which include professional managers and scientists, “compete in the tournament to advance their value systems through the science they advocate or practice, through the definitions of environmental quality they use or study, and through the management goals they champion”.

Hull and Robertson (2000) contended that there is a language for discussing and describing nature, and that people participating in the process need to understand that the language, its terminologies and definitions, are value-laden. For example, what are the definitions of naturalness, health, and integrity, and does everyone involved agree about those definitions? Hull and Robertson emphasize that it is difficult to find agreement about which nature should be restored: past, present, or future natures. Also, how much evidence of man is acceptable?

David Cole and Laurie Yung, discuss in their recent book *Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change* (2010), “the conundrum of naturalness as a management objective, and the need to be open to evidence of man, even in wilderness settings, in order to facilitate appropriate intervention by man in deliberate management activities”. These authors promote the term intervention because it includes any prescribed course of action that is intended to alter the course of an ecosystem, and not the return to some past preferred condition (i.e. European pre-settlement). These authors also feel that in many cases, redirection is a better term to use than restoration. Cole and Yung argue that the goals that guided the
conservation and restoration of large protected areas during the twentieth century (parks and wilderness) overly stressed the concept of “naturalness”. The idea of naturalness does not provide sufficient guidance for necessary ongoing stewardship of landscapes, and so is not very helpful in making decisions of whether or not, or how, to intervene. Because naturalness implies a lack of human impact and control, inevitably, this meaning of naturalness will always be violated whenever something is done, or not done. Over time, humans make numerous decisions about the management of landscapes; decisions about how to intervene. Management objectives and desired outcomes must be clearly articulated, well-supported, and they must be “knowable, attainable and desirable” (Cole and Yung, 2010).

Cole and Yung reflected upon the complex challenges that managers face over stewardship, and the rapid rate of change that is adding to that complexity. To these authors, it is becoming increasingly clear that just leaving nature alone (naturalness) does not conserve biodiversity or other values associated with protected areas. Based on this concern, Cole and Yung wrote their book in order to engage managers, scientists, policy makers, as well as the public, in thoughtful deliberation about the future of protected areas in the United States. These authors hope that such a dialogue will result in a more explicit and transparent consideration of priorities and trade-offs in landscape management. They also hope that ultimately this dialogue will lead to greater innovation and development of more effective strategies for adapting to the changing context that climate change and a host of other stressors to the environment now present. Active management is necessary to conserve biodiversity and the other values that society places on landscapes (Cole and Yung, 2010).
Similarly, Hull and Robertson (2000) stated that scientists, professional managers and involved citizens are all stakeholders who play an essential role in developing a body of managerially-relevant environmental knowledge. They explained that “a more public ecology will be a more powerful ecology, facilitating the negotiation and construction of restoration and management goals”. Like Hull and Robertson (2000), Bryan Norton explained in his book *Sustainability* (2005) that a common language is needed in order to bridge professional and public dialogue on ecology. Norton pointed to “management science as the science that can integrate our vocabularies, not the sciences of biology, physics, economics and the like, which have been artificially and completely purged of evaluative judgments”. Since environmental problems inevitably involve competing social goals, Norton argued, only the management science of *adaptive management*, and choosing a set of common terminologies and definitions within it, can teach society to properly frame ecological problems.

Adaptive management, as defined by Allan and Stankey (2009), is “the purposeful and deliberate design of policies in such a way to enhance learning as well as to inform subsequent action”. These authors describe the common problem in natural resources management, where we find high levels of complexity and uncertainty, combined with differing scales of impacts, and multiple disciplinary, geographic and political boundaries. These complexities render society’s ability to produce effective policies and programs problematic (Allan and Stankey, 2009). Adaptive management allows us to integrate the sciences in our strategic dealings with the issues, identified by Norton as those that lie between society’s need to develop and its long-term survival, and that Cole
and Yung described as the priorities and trade-offs involved in their intervention stewardship.

A great deal has been written and debated about the concept of adaptive management in dealing with natural resources (Bormann et al., 1999). With the publication of C.S. Holling’s 1978 book *Adaptive Environmental Assessment and Management*, adaptive management was offered for its potential as a framework that could deal with complex environmental management problems (Stankey et al., 2005). This work was produced by Holling’s experiences with resilience theory (Holling, 1973), derived from the idea that there is more than one stable state for ecosystems. Holling explained that the then-popular equilibrium-centered view presented an essentially static situation, and did not acknowledge the transient behavior of natural systems. Holling further emphasized that most ecosystems that we perceive to be natural and undisturbed are actually in a continually transient state, and that they should be equally so under the influence of man (Holling, 1973).

Whereas Holling’s emphasis was on using adaptive management to bridge the gap between science and practice, the later publication of *Adaptive Management of Renewable Resources* by Carl Walters (1986) focused on treating management activities as designed experiments that could be used to reduce uncertainty (Allen et al., 2011). Walters described adaptive management as “the process of defining and bounding the management problem, identifying and representing what we know through models of dynamics that identify assumptions and predictions so experience can further learning, identifying possible sources of uncertainty and identifying possible alternate hypotheses, and finally designing policies to allow continued resource management or production
while enhancing learning” (Allen et al., 2011). Later publications, *Compass and Gyroscope: Integrating Science and Politics for the Environment* (Lee, 1993), and *Barriers and Bridges to the Renewal of Ecosystems and Institutions* (Gunderson et al., 1995) stressed that the natural resources management is highly value-laden. These authors explored the importance of design and experimentation as well, and viewed policies as experiments from which societies can learn. They uncovered the iterative link between knowledge and action, the integration and legitimacy of knowledge from various sources, and the need for responsive institutions (Stankey et al., 2005).

Critics of adaptive management have contended that it is simply a version of Lindblom’s (1959) “disjointed incrementalism” or “muddling through” model (Allan and Stankey, 2009; Stankey et al., 2005). What distinguishes adaptive management from incrementalism is its *purposefulness* (Dovers, 2003), where agreed-upon goals and objectives provide the measurement for improvement or success and lessons are learned. Adaptive management mimics the scientific method by highlighting uncertainties, specifying and evaluating hypotheses, and structuring actions that can test those hypotheses through field implementation (Gunderson, 1999). It is an iterative process that emphasizes learning, builds upon a growing body of knowledge, and the adaptation of management is based upon what has been learned. Reminding us of the concepts discussed under carrying capacity and LAC, it is a designed experiment with a specific procedural structure, clear goals and management objectives, and identification of possible alternatives. It is repeatable, and monitoring of conditions is essential. Adaptive management involves more than traditional incrementalism; learning comes from
purposeful experimentation that is derived from deliberate, formal inquiry, not unlike scientific study (Allen et al., 2011; Allan and Stankey, 2009; Stankey et al., 2005).


1. An effort to integrate existing interdisciplinary experience and scientific information into dynamic models that can be used to frame predictions about the impacts of alternative policies; this step performs three key functions:
   - Problem clarification and enhanced communication among scientists, managers, and other stakeholders.
   - Policy screening to eliminate options unlikely of doing much good because of inadequate scale or type of impacts.
   - Identification of key knowledge gaps that make predictions suspect.

2. Design of a specific management experiment.

Stankey et al., (2005) added a third component to this list, which links the results of a management experiment with the policymaking process; i.e., in light of the actions taken in an experimental setting, how do those results translate into changes in ongoing land management practices. These authors felt in many ways that this third component is where the idea of “adaptive” comes into play; it is the idea that future steps are based on feedback from the results of experimentation (Stankey et al., 2005).

Stankey et al., (2005) explained that the first step is the crucial phase that Walters (1986) referred to as “bounding the problem”, where he felt that most resource policy
analyses go astray. The lack of a solid problem definition can lead to inappropriate attention being placed toward symptoms and solutions (Van Cleve et al., 2004). An up-front modeling phase that properly bounds the problem better stimulates an early discussion among stakeholders about values, goals, objectives, and management options (Stankey et al., 2005).

Stankey et al. (2005) further explained that adaptive management is a learning process that is information-intensive, requiring active and ongoing participation from the stakeholders who could be affected by the policies under consideration. This emphasizes the social and political aspect of adaptive management (Lee, 1999; Stankey et al., 2005). Lee (1993) noted “Managing large ecosystems should rely not merely on science, but on civic science; it should be irreducibly public in the way responsibilities are exercised, intrinsically technical, and open to learning from errors and profiting from successes.” Lee asserted that civic science is a political activity; “Ecosystem-scale science requires political support to be done. Learning in such a setting cannot take place without active political support; there are too many ways for things to go wrong without it” (Lee, 1993).

**NEPA “Gridlock” and the Call to Collaborate**

Endter-Wada et al. (1998) found that for resource management agencies, especially the Forest Service and Bureau of Land Management (BLM), the idea that humans are an integral part of nature is more than rhetoric. In their paper titled *A Framework for Understanding Social Science Contributions to Ecosystem Management* (1998) these authors proposed a framework for understanding the role that social sciences play in ecosystem management. They pointed out that agency position statements have
continued to emphasize that ecosystem management means balancing both social and ecological goals. These authors reviewed a number of task force reports completed during the 1990s that implemented the social component of ecosystem management. They listed several major ecosystem assessments by federal land management agencies that exhibited increased attention to social dimensions, with most of the emphasis on integrating humans into ecosystem management focusing on decision-making processes (Endter-Wada et al., 1998).

One of the task force reports reviewed by Ender-Wada et al. (1998) was the multi-agency report titled *Forest Ecosystem Management: and Ecological, Economic and Social Assessment*, which reflected Lee’s views on adaptive management (1993, 1999). This report was the work of the Forest Ecosystem Management Assessment Team (FEMAT), one of three interagency working groups assembled by President Clinton following the Forest Conference held in Portland, Oregon on April 2, 1993. The purpose of this team was to discuss the “gridlock” in forest management in the Pacific Northwest, and to identify alternatives that might resolve that gridlock (FEMAT 1993; Stankey et al., 2006).

The FEMAT was able to respond to these tasks in two ways. First, the FEMAT discussed the adaptive management concept, determining that it was a “crucial element of any ecosystem-based strategy” (FEMAT, 1993). Second, it developed a specific land allocation called adaptive management areas (AMAs), which were to be used in developing and testing new management approaches toward achieving desired ecological, economic, and other social objectives. This process would also include the opportunity for voluntary participation in forest management activities by willing participants. The
AMAs would serve as an end in themselves, and provide a structure for developing knowledge among citizens, managers, and scientists; applying the knowledge; and learning and adapting based on those applications (Stankey et al., 2006).

In the Lessons Learned section of their report, the FEMAT concluded that “people will not support what they do not understand, and cannot understand that in which they are not involved” (FEMAT, 1993) stating that:

“Many professionals bemoan the seeming lack of understanding the public has for natural resource issues. In many respects this is probably true. But professionals do not understand the public well either. The situation will change when public and agency education and involvement processes become truly participatory, with the public an active partner. Scientists, managers, and citizens all have knowledge important to understanding and resolving issues. Having mutual respect for the people who have information, and creating an environment for mutual learning, are critical for success. Not doing so will likely lead to further polarization.”

This captures the political element of adaptive management that is Lee’s “gyroscope” (i.e., “the pragmatic application of politics”), which is the companion to his “compass” of science; “the idealistic application of science to policy” (Lee, 1993; Stankey et al., 2005).

The USDA Forest Service research paper Learning to Manage a Complex Ecosystem: Adaptive Management and the Northwest Forest Plan (Stankey et al. 2006) studied the Northwest Forest Plan. Among the many interesting findings of this study was that although managers rated themselves highly in terms of paying attention to local issues and following through on decisions, this view was not shared by citizens. Citizens generally felt their input was discounted; less than half believed they actually could
participate in planning and even fewer believed that agencies used their suggestions in making decisions. Both managers and citizens gave low ratings regarding the extent to which citizens could trace how their input was used and in how well citizens understood the AMA decision processes.

Equally distressing is that 40 percent thought that local managers did not have the full support of their national leaders. There was growing sentiment within many forest communities that local forest managers, in many cases individuals they have come to know and trust, were hindered from doing their jobs because of directives from Washington, D.C. or by pressure from national interests outside their local area (Shindler and Toman, 2002; Shindler and Wright, 2000). Over 80 percent of managers agreed that lack of public trust and credibility constrained efforts to implement an adaptive approach (Stankey et al., 2006).

Stankey et al., (2006) felt that there were several reasons for these findings. First, agencies have had difficulty getting their message of open participation across to constituents. Second, the public does not believe that managers will or can fulfill the promise of citizen participation. In many cases this belief is anchored in experiences that go back over 30 years. Third, there is no compelling evidence that managers are communicating with or involving the public. According to Stankey et al., a root cause might lie in fundamental differences in the way in which managers and citizens define the concept of involvement. For many managers, public involvement is limited to that which meets statutory requirements and conforms to procedural compliance. Citizens, on the other hand, have come to see public involvement as a means of political empowerment, as a way of gaining access to, and becoming equal players in, forest management
decision-making. Rather than simply commenting on the adequacies of proposed management actions, citizens feel that they should be equal players at the table along with managers and scientists, helping to frame problems, identify strategies, and provide information and knowledge throughout the process (Stankey et al., 2006). This is evidenced by the increasing involvement by organizations, clubs, and local governments in federal projects.

The study found a number of additional confounding circumstances, as well. It seemed that managers did not always embrace or accept the concept of adaptive management as outlined by the FEMAT. Managers placed in charge of implementing adaptive management may have lacked the leadership skills to make the needed transformations. Among some managers, there was perceived to be a “business-as-usual” mentality, probably grounded in the traditional management culture. Actions did not match words, as managers were not allowed to implement adaptive management as it was intended in the Northwest Plan. There were both internal and external political constraints that acted to suppress innovation and experimentation. Regulatory agencies imposed constraints that thwarted changes in management practices and there was a limited ability to gain relief from conflicting standards and guidelines, rendering managers unable to implement adaptive management actions (Stankey et al., 2006).

In a study and article titled *Visions of Success and Achievement in Recreation-Related USDA Forest Service NEPA Processes*, (Stern et al., 2009) 106 Forest service interdisciplinary team leaders were surveyed to determine 1) their definition of success in their recreation-oriented NEPA processes, 2) how their perceptions of appropriate measures of success relate to their achievement, and 3) what factors appear to lead to the
most positive perceived outcomes in these processes. The authors explained that the following were primary reasons the study focused on recreation-related NEPA:

- The 2003 statement by Chief Dale Bosworth calling “unmanaged recreation” one of the four great threats to forest management in the U.S;
- The Forest Service’s new strategic plan listing “to sustain and enhance outdoor recreation opportunities” amongst its eight goals for 2007 through 2012;
- The 2005 Travel Management Rule issued by the Forest Service, requiring all National Forests to designate a system of roads and trails, prohibiting off-road or trail, cross-country motorized travel, in order to improve motorized and non-motorized recreation opportunities.

In particular, the Travel Management Rule created a surge in NEPA for recreation-related activities on National Forest lands (Stern et al., 2009). Again, recreation is one of the primary ways that most people interact with National Forests, and managers often find themselves in complex situations in their attempts to balance resource protection with the often competing interests of multiple publics (Blahna, 2007). These must be addressed through the NEPA processes. However, while the enactment of NEPA provided opportunities for public comment and participation, it did not empower individuals to directly influence agency decisions (Stern et al., 2009). Decision-making authority instead remains with the agency. NEPA did require additional transparency and empowered stakeholders to challenge decisions on procedural grounds.

The results of the study suggest that managers perceive achievement of public involvement as meeting statutory requirements and conforming to procedural compliance, while meeting the expectations of citizens for greater empowerment and
equality in forest management decisions do not rate as important to managers (Stern et al., 2009). According to this study, the highest importance in defining success for ID team leaders was full disclosure of analysis, project implementation in accordance with the mission of the Forest Service, and procedural compliance. The highest percentage, 39%, selected project implementation in accord with the agency mission as one of the top three most appropriate measures. 39% also selected as most important a final decision that minimizes adverse environmental impacts. While considered to be important, only 6% selected as most important a final decision that minimizes adverse socioeconomic impacts. Only 18% selected decision-making processes that are made transparent to all stakeholders and that all procedures are followed correctly, but these were still considered fairly important. It was more important that public participants are satisfied with the process (25%) than it was that public participants are satisfied with the final decision (8%).

In rating their project’s achievement of the potential measures of success, ID team leaders generally felt that they were able to achieve all of the measures to some degree. It seems that teams were able to achieve what their ID team leaders felt was most important. In displaying the relationships between importance and achievement scores the following was the ranking of the scores (Stern et al., 2009):

1. Full disclosure of impact analyses has taken place.
2. Development of a well-documented rationale for decisions.
3. The project gets implemented.
4. Transparency in the decision-making process.
5. The final decision reflects the mission of the agency.
6. All procedures are followed correctly.
7. The final decision minimizes adverse environmental impacts.
8. The final document is easy to read and understand.
9. The process employs the best available biophysical science.
10. Public participants are satisfied with the process.
11. Other agencies are effectively engaged.
12. The process is completed in a timely manner.
13. The process employs the best available social science.
14. The final decision minimizes adverse socioeconomic impacts.
15. All team members are satisfied with the process.
16. Public participants are satisfied with the final decision.
17. Compromise has taken place between interested parties.

The most appropriate measures of success reported by team leaders were largely associated with disclosure and implementation, managing stakeholders and internal team-related factors also seemed paramount (Stern et al., 2009). Communicating and interacting in a positive way with the public were shown to be an ongoing challenge to these processes. Some of the poorest achieved measures were those that included producing an easy-to-read document, minimizing socioeconomic impacts, satisfying the public, and facilitating compromise between interested parties. These findings reflect those of Stankey et al. (2006) discussed earlier, suggesting a fundamental difference in how managers define the concept of public involvement as being that which meets statutory requirements and conforms to procedural compliance, versus meeting the
expectations of citizens for greater empowerment and equality in forest management
decision-making (Stankey et al., 2006).

Keough and Blahna, in their paper titled *Achieving Integrative, Collaborative Ecosystem Management* (2006) made the point that there are broader, interdisciplinary approaches to decision-making that are preferable to the traditional management approach of simply meeting statutory requirements and conforming to procedural requirements (Stankey et al., 2006). These include ecosystem management, adaptive management, sustainability, ecological integrity, and collaborative decision making however they added, there is ongoing resistance by some concerning the scientific value, measurement, and practical use of such concepts (Keough and Blahna, 2006).

Keough and Blahna described conceptual models illustrating the integration of social, ecological and economic considerations. The first was introduced by Firey who in 1960 argued that for species reintroduction to be successful, it had to be ecologically possible, ethnographically adoptable, and economically gainful for local people (Tear and Forester, 1992). Similarly, in 1997 Gilmore argued that ecosystem management decisions should be ecologically sustainable, socially acceptable, and economically feasible. Keough and Blahna summarized that if ecosystems and human communities are interdependent, their sustainability must be managed simultaneously. But how would those efforts be effectively integrated?

Keough and Blahna referred to Cortner and Moote (1999) who presented two broad decision-based approaches to ecosystem management: trade-off and tension. Trade-off approaches tend to prioritize ecologic or socioeconomic concerns, at the expense of one or the other. As a result interested parties become polarized and the decision-making
environment open to compromise. Cortner and Moote instead promoted a tension approach, where social, economic, and ecological goals are integrated and balanced such that managers attempt to meet them simultaneously. According to Keouagh and Blahna, this approach requires collecting social, economic, and ecological baseline data, monitoring results over time, and conducting adaptive management (Cortner and Moote, 1999; Lee, 1993; Stankey et al., 2003). Keough and Blahna also referred to Lee’s compass and gyroscope in the application of tension, where compass refers to the use of empirical data and adaptive management to help identify directions for environmental sustainability, and gyroscope refers to balancing competing human needs through democratic processes (Keough and Blahna, 2006).

In the process of integrating social and ecological sustainability, Keough and Blahna explained that managers should strive to develop “win-win” partnerships through collaborative approaches, and going beyond the “traditional” public involvement that only strives to meet statutory requirements and conforms to procedural requirements. Collaboration requires early, inclusive and interactive public involvement. Collaboration should not be bound by time, and should be ongoing through implementation and monitoring (Cortner and Moote, 1999). Keough and Blahna described this as the essence of collaborative stewardship, where stewardship of the land is integrated with stewardship of the local communities that depend on the land (Callicott, 2000; Keough and Blahna, 2006; Leopold, 1949). A literature review conducted by Keough and Blahna identified eight factors that are important for integrative, collaborative ecosystem management. The following is their explanation:
1) Integrated and balanced goals. Managers attempt to meet social, economic, and ecological goals simultaneously so that all three categories benefit and the benefit is maintained over time (Firey, 1960; Gilmore, 1997; Meffe et. al., 2002). By creating an integrated balance among all three goals, management plans are more likely to be socially acceptable, economically feasible, and ecologically sustainable.

2) Inclusive public involvement. The process includes all potential stakeholders, regardless of their relative size and influence (Cortner and Moote, 1999; Daniels and Walker, 2001), which is essential to achieving broad-based support. Because it may not be possible to identify all stakeholders, all sides of the issues must be adequately represented in the process.

3) Stakeholder influence. It must be ensured that stakeholder input is actually used and it must have a real impact on final decisions, such that stakeholders are empowered through meaningful participation (Cortner et al., 2001; Gray, 1989; Walker and Daniels, 1996). Joint decision-making requires sharing the decision-making space. This may range from simply listening to stakeholder concerns and showing them how their input was used (informal power sharing) to setting up structures for the agency to work with stakeholders in decision and implementation processes (formal power sharing).

4) Consensus group approach. Stakeholders meet as a group and use a consensus-based process for providing input (Cortner and Moote, 1999; Daniels and Walker, 2001; Wondolleck and Yaffe, 2000). This is an opinion or position reached by a group as a whole, and not one primarily influenced by the agency or
a few key stakeholders or one that requires unanimous approval. Consensus seeks balance among a broad range of values, and is thus a key element of collaborative processes.

5) Collaborative stewardship. Stakeholders develop a sense of ownership for and become personally invested in in the plan or decision (Kemmis, 1990; Wondelleck and Yaffee, 2000). Stewardship results if stakeholders actively participate in ongoing management efforts after decisions are made.

6) Monitoring and adaptive management. Stakeholders agree to include monitoring in plan implementation and support future remedial actions needed to meet environmental and social goals (Gunderson and Holling, 2002; Stankey et. al., 2003). Monitoring holds stakeholders accountable for evaluating management effectiveness and provides assurance that management efforts are focusing on agreed-upon goals.

7) Multidisciplinary data. Ecological, social, and economic variables are included during data collection, analysis and monitoring. Multiple data types are valuable for identifying and balancing a broad range of values. Because understanding social acceptability is dependent on better processes of public involvement and collaboration and on the collection and inclusion of social science data (Ender-Wada et. al, 1998; Lee, 1993), funding and effort should be allotted to meet socioeconomic and ecological science needs.

8) Economic incentives. Economic incentives exist for stakeholders, local communities, and agency partners to implement plans or decisions. Financial support is needed to cover plan implementation and monitoring costs and to
provide assistance to those bearing the cost of management directives. Equity considerations are critical for developing long-term support for management plans (Firey, 1960; Gilmore, 1997; Tear and Forester, 1992).

Keough and Blahna concluded that the integrated, tension approach reflects the importance of compromise in achieving ecosystem management goals. They added that many of the public land conflicts and ecological problems of the last century arose because resource management decisions failed to balance social, economic, and ecological objectives (Keough and Blahna, 2006).

When Congress established the Forest Service in 1905, it did not require the agency to write long-term management plans or strategies. Beginning in the 1970s, and the environmental controversies discussed earlier, Congress instituted long-term planning requirements for the agency. In the 1990s, greater emphasis was placed on involving stakeholders in decisions affecting public land management (Brouha and Grinspoon, 2006).

In recent years, the Forest Service has made a visible shift toward broader public participation and openness in how the agency carries out its mission to “sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations” (USDA, 2010c). A look at the Forest Service’s homepage on the World Wide Web illustrates that the agency is emphasizing considerable change (USDA, 2010d). Chief Tom Tidwell welcomes readers with a statement that the agency is “dedicated to restore and enhance landscapes, protect and enhance water resources, develop climate change resiliency and help create jobs that will sustain communities”. Headlines include a focus on partnerships with other nations,
agencies and private landowners. The recent unveiling of the final planning rule is featured as “the most collaborative rulemaking effort in Agency history”, including “stronger protections for forests, water, and wildlife while supporting the economic vitality of rural communities”. In the employee spotlight is a research physical scientist with the Forest Service who is working with International Programs on a project called “Sustainable Landscapes” funded through the United States Agency for International Development. Sidebar links take readers to information on the agency’s Sustainable Operations program and the Collaborative Forest Landscape Restoration Program (CFLRP), established by Congress in 2009 in order “to encourage the collaborative, science-based ecosystem restoration of priority forest landscapes”. Congress authorized up to $40,000,000 to be spent annually through the CFLR Fund for fiscal years 2009 through 2019 on projects meeting specific eligibility criteria (USDA, 2010d). Speeches by Chief Tidwell are found also here announcing USDA Secretary Tom Vilsack’s cross-boundary “all lands” approach to watershed and forest management, including efforts toward a new planning rule, emphasizing a collaborative approach to forest and community sustainability (USDA, 2012d, 2012i; Tidwell, 2010). These are just some examples of the changes in the focus of the Forest Service.

The Montreal Process and Forest Service Strategic Planning

In their paper Strategic Planning for Sustainable Forests: The Plan Drives the Budget Which Drives Results (2006), Brouha and Grinspoon discuss a significant area of major change occurring in the Forest Service; the establishment and use of strategic plans. These authors emphasized that “essential to success of the Forest Service mission are
long-term strategic plans, which communicate policy and guide the agency”. They explained that strategic planning “provides guidance for future agency actions by elucidating the agency’s mission, as well as strategic goals and objectives. These goals and objectives describe a specific course towards achieving the agency’s mission. The strategic plan, however, does not specify what work the Forest Service will undertake”.

Various unit plans, including Land and Resource Management Plans mandated under NFMA (1974), known commonly as Forest Plans, communicate the goals and objectives for annual programs of work at the National Forest level (Figure 9).

According to Brouha and Grinspoon “nearly twenty years after Congress first instituted long-term planning requirements, it passed the Government Performance and Results Act (the Results Act) of 1993 mandating that each federal government agency prepare five-year strategic plans in consultation with Congress and with input from stakeholders”. The initial strategic plan written in 1997 by the Forest Service under the Results Act was output-oriented and focused on management activities, performance measures and timeframes. While the 1997 Strategy laid out goals for certain resource areas, it lacked the needed baseline data from the field and had poorly defined indicators, making it difficult to demonstrate progress or success. To improve this situation, the

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Figure 9: The Forest Service Mission is the foundation for planning and program delivery at every level of the agency Source: Brouha and Grinspoon, 2006.
agency began linking goals and objectives to science-based indicators of sustainability, derived from what is known as the Montreal Process (Brouha and Grinspoon, 2006).

The Montreal Process was an initiative among non-European boreal forest countries, with the purpose of developing internationally agreed-upon criteria and indicators of sustainability. The Montreal Process was inspired by and followed the sustainability statement from the 1992 Rio Earth Summit discussed earlier, and its definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland, 1987).

An International Seminar of Experts on Sustainable Development of Boreal and Temperate Forests was convened in Montreal, Quebec, Canada. Following the seminar in 1995, the Montreal Process Working Group met and stated its goal: “to advance the development of internationally agreed upon criteria and indicators for the conservation and sustainable management of temporal and boreal forests at the national level.” The Working Group issued the Santiago Declaration, named after the city in which group members adopted this non-binding agreement on criteria and indicators for sustainable forest management. Twelve countries, amounting to 90% of the world’s boreal forest, endorsed the declaration. The Montreal Process framework is composed of seven criteria and 67 indicators. The Working Group defined the criteria as categories of conditions or processes by which sustainable forest management would be assessed. Indicators were defined as measures (measurements) of an aspect of a criterion. The seven criteria fell into three categories: vital functions and attributes (biodiversity, productivity, forest health, the carbon cycle, and soil and water protection), socio-economic values and
benefits (timber, recreation, and cultural values) and the laws and regulations that comprise the forest policy framework (Brouha and Grinspoon, 2006; MPWG, 1999).

Following the Earth Summit, through a Presidential Directive in 1993, the United States agreed to non-binding principles on forest conservation and sustainable use, the directive stated “…we must take the lead internationally by observing these principles ourselves… The United States is committed to a national goal of achieving sustainable management of U.S. forests... Our national objectives are that: our nation’s forests should be healthy and productive; the growth of our timber should exceed harvest; and our forests should be reservoirs of biological diversity and carbon” (Presidential Decision Directive/NSC-16; Brouha and Grinspoon, 2006).

In 1994, the Forest Service and the U.S. State Department organized a group of stakeholders to provide a forum for discussion of the Montreal Process Criteria and Indicators. The forum, officially chartered in 1999, was known as the Roundtable on Sustainable Forests. The Roundtable had no decision-making authority; however, it sought to improve decision-making through sharing of information sharing and the perspectives of a diverse group. More than 40 government and non-governmental organizations participated in the Roundtable including federal government agencies; tribal, state, and local units of government; private landowners and citizens; industries and businesses; conservation and environmental groups; regional and community-based organizations; as well as researchers and academics (Brouha and Grinspoon, 2006).

Brouha and Grinspoon went on to explain that the core principles of the Montreal Plan were manifested in the goals of the 2000 Strategic Plan Revision of the Forest Service, covering social, ecological and economic values of sustainability. Furthermore,
the connections to the Montreal Plan are clear in the objectives and indicators of the 2000 Strategic Plan. However, measurement problems arose due to the ongoing problem of insufficient data from the field. Milestones for meeting objectives were vague and data unavailable for some indicator species. Watersheds were not fully delineated and comprehensive monitoring protocols were lacking. Problems with inadequate baseline data made it impossible for the agency to demonstrate credible accountability for achieving long-term results toward sustainability. Subsequently, the 2000 Strategic Plan was unable to drive performance of agency programs, and budget development and program allocations remained separate from strategic planning processes (Brouha and Grinspoon, 2006).

In 2004, the Forest Service released a new strategic plan that strengthened connections between the science-based criteria and indicators reflective of the Montreal Plan. This plan was set for fiscal years 2004 to 2008. Largely, this means that the 2004 Strategic Plan incorporated the Montreal Process Criteria and Indicators framework for communicating condition and trend information, providing a vocabulary for effective engagement of stakeholders, so they may work productively with the various institutions and jurisdictions that have a mutual interest in sustainable forest management. The plan revolved around three conditions: to sustain the health, productivity and diversity of the nation’s forests and grasslands; to sustain a flow of goods and services from the nation’s forests and grasslands; and, to sustain the organizational capacity to support conservation and management (Brouha and Grinspoon, 2006).

By examining previous agency efforts, as well as the full array of the 67 indicators of sustainability from the Montreal Plan, a policy was developed that included a set of
measurable objectives that were linked to key social, economic and ecologic conditions. Measures were designed to assess progress toward mission-critical objectives, focusing on demonstrating program effectiveness and organizational capacity. The new Strategic Plan looked at baseline and trend data, and described objectives in terms of influencing long-term trends. This information was used to drive strategic business plans at the Regional and National Forest level, which in turn directed the basic programs essential to mission delivery and the objectives of the local Forest Plan (Brouha and Grinspoon, 2006).

As part of this package, a new performance accountability system was activated that would track the annual allocation of targets and funding, and the expenditure of those funds, with the purpose of providing a clear picture of how each project contributes to achieving strategic goals and contributes to sustainability (Brouha and Grinspoon, 2006). Accomplishment information is drawn continuously from the agency’s databases. Because this data is used to inform agency performance and accountability, and is a key factor in assessing the performance of the agency’s Senior Executive Service cadre and GS14-15 managers and supervisors, data entry has become a required part of daily life for many Forest Service employees located at the ground-level.

At the time of this writing, the planning cycle began with an updated Strategic Plan for the Fiscal Years 2007-2012. Following an introduction to the agency mission and values by Chief Abigail Kimball, the Strategic Plan described the agency’s issues and management principles. Much of this description focused on a more diverse, urbanized U.S. population that is feared to be losing touch with its natural resources, and the management that will sustain them. The Strategic Plan went on to explain that, in order
to achieve sustainability, which is the capacity of forests and grasslands to maintain health, productivity, diversity, and overall integrity, the Forest Service must integrate environmental, social, and economic issues and values into its management decisions and actions, while accounting for future as well as present needs (USDA, 2007).

The Strategic Plan stated the agency’s continued commitment to reducing the Four Threats, announced by Chief Dale Bosworth in 2003 and discussed earlier: 1) the risk of loss from catastrophic wildland fire caused by hazardous fuel buildup; 2) the introduction and spread of invasive species; 3) the loss of open space resulting in fragmentation of forests and grasslands that impairs ecosystem function; and 4) unmanaged recreation, particularly the unmanaged use of off-highway vehicles. The goals and objectives of this Strategic Planning cycle would be aimed at mitigating these threats through the agency’s natural resource programs and through collaborative efforts with other agencies, States, tribes, local communities, and other partners. Forest and grassland restoration efforts would focus on reestablishing structural characteristics, native species, and ecological processes that have been adversely affected by human activities and natural disturbances. The Strategic Plan explained that active management would be required to achieve ecosystem restoration objectives, and income from commercial uses of natural resources may be used to help fund restoration activities. Forest Service managers were instructed to use the best available science to understand and mitigate the causes of environmental damage. The Strategic Plan explained the agency’s involvement in sustainability issues at both domestic and international levels (USDA, 2007).
Following the planning and accountability procedures described earlier by Brouha and Grinspoon (2006), the Strategic Plan identified seven goals and subsequent sets of objectives for fiscal years 2007 through 2012 (USDA, 2007):

1. **Restore, Sustain, and Enhance the Nation’s Forests and Grasslands.** Desired outcome: Forests and grasslands with the capacity to maintain their health, productivity, diversity, and resistance to unnaturally severe disturbance.

2. **Provide and Sustain Benefits to the American People.** Desired outcome: Forests and grasslands with sufficient long-term multiple socioeconomic benefits to meet the needs of society.

3. **Conserve Open Space.** Desired outcome: Maintain the environmental, social, and economic benefits of forests and grasslands by reducing and mitigating their conversion to other uses.

4. **Sustain and Enhance Outdoor Recreation Opportunities.** Desired outcome: A variety of high-quality outdoor recreational opportunities on the Nation’s forests and grasslands are available to the public.

5. **Maintain Basic Management Capabilities of the Forest Service.** Desired outcome: Administrative facilities, information systems, and landownership management with the capacity to support a wide range of natural resource challenges.

6. **Engage Urban America With Forest Service Programs.** Desired outcome: Broader access by Americans to the long-term environmental, social, economic, and other types of benefits provided by the Forest Service.
7. Provide Science-Based Applications and Tools for Sustainable Natural Resources Management. Desired outcome: Management decisions are informed by the best available science-based knowledge and tools.

Under Goal 4: *Sustain and Enhance Outdoor Recreation Opportunities*, the Strategic Plan explains that the agency is challenged with sustaining high-quality recreation experiences while maintaining the ecological integrity of National Forests and Grasslands, especially with the projected increase of the U.S. population by 50% by the middle of this century. In order to provide recreation benefits without unacceptable resource impacts, the agency would emphasize management solutions with a solid scientific foundation. The condition of the land, recreation facilities, and transportation infrastructure, including off-highway vehicle access, would all be considered in making recreation management decisions. Specially designated areas would be maintained. The agency would work with volunteers, partners, non-governmental organizations, other agencies and the private sector to achieve the desired results (USDA, 2007).

As described in the Strategic Plan, the following are the objectives and performance measures stated under this goal:

1) Improve the quality and availability of outdoor recreation experiences, with the following targets accomplished by 2012:

- 81% recreation sites maintained to standard.
- 30% of recreation sites meeting accessibility standards.
- 60% of trails meeting national quality standards.
- 85% customers satisfied with recreational facilities, services, and settings.
• 75% of road system intended for passenger-car use that is suitable for passenger-car use.

2) Secure legal entry to national forest lands and waters, with the following target accomplished by 2012:
   • 95% of high-priority access rights-of-way acquired.

3) Improve the management of off-highway vehicle use, with the following target accomplished by 2012:
   • 100% of NFS lands covered by new motor vehicle use maps reflecting a designated-use system of roads, trails, and areas.

The Strategic Plan went on to identify a number of means and strategies for this goal:

• Provide tools, guidance, and resource management to provide safe recreation use and to prevent or mitigate the ecological impacts of recreation activities (including off-highway vehicle impacts).

• Improve our understanding of the relationship between the quality of the recreation experience and the quality of the environment to help managers optimize recreational opportunities and investments.

• Develop the tools necessary to protect and sustain designated wilderness areas and the ecological and social values derived from designated wilderness areas.

• Develop information about visitor trends, behavior, and experiences to help managers and communities provide the recreation services and benefits that visitors seek.
• Provide recreational opportunities consistent with an area’s physical, biological, and social characteristics and capabilities.

• Acquire and provide appropriate access to recreational opportunities.

• Efficiently and effectively manage and maintain recreational opportunity infrastructure while protecting public health and safety (including facility reconstruction and decommissioning, where appropriate).

• Maintain and improve a user-fee program.

• Use private, nongovernmental, and interagency partnerships to accomplish collaborative community recreation/tourism plans.

In a more recent development, the Forest Service released its “Framework for Sustainable Recreation” (USDA, 2010b), where the agency described a number of challenges to providing quality recreation as being “unprecedented”:

• Demographic shifts and lifestyle changes have greatly affected demand for recreation on National Forests and Grasslands. With 80% of our population living in cities, our country is the most urban it has ever been. For many, the only exposure to the natural environment is what they see on television and computer screens. Others find our existing recreation facilities and programs not in line with their cultural traditions.

• Growth of retiree communities and other population shifts have created population centers close to many public lands. This has resulted in many of our forests being enjoyed as regional and municipal parks adding additional strain on visitor facilities, services, and natural settings.
The condition of our recreation and heritage assets has steadily diminished, resulting in a ballooning backlog of maintenance needs for recreation facilities, trails, and roads.

Unmanaged recreation has contributed to degraded recreation settings, damaged heritage sites, unacceptable resource impacts, and conflicts between users.

National economic conditions and mounting financial demands underscore the inadequacy of traditional funding sources to meet growing needs, yet user fees and private sector involvement to deliver services remain controversial to some.

In developing a strategy to address these challenges, the agency identified six Sustainable Recreation Principles:

- Connecting people with their natural and cultural heritage
- Recreation activity in the great outdoors promotes healthy lifestyles
- Sustainability underlies all program decisions
- Community engagement is essential
- National Forests and Grasslands are part of a larger landscape

Of the ten focus areas that were discussed in the strategy for sustaining the agency’s recreation program, Chief Tom Tidwell named these key elements:

1. Restoring and adapting recreation settings
2. Investing in special places
3. Forging strategic partnerships
4. Promoting citizen stewardship
5. Developing our workforce

6. Know our visitors, community stakeholders, and other recreation providers

Over time, society has changed in the demands and expectations it has placed upon natural resources, and the recreation opportunities associated with those resources. These were among the things that made this country prosperous and improved the quality of life for those living here. The view has broadened over time, becoming more global in the process. *Integration* has replaced single-resource management, *sustainability* looks to move into the position once held by *conservation*. *Interaction, collaboration* and *shared problem solving* are the directions now given to the Forest Service by agency leadership. The government has clearly inserted this paradigm into agency policy, but is it materializing at the ground level?

As described earlier, science and policy had an early focus on determining site and resource capacities, and developing new facilities, roads and trails to contain impacts and keep up with demand. Over time, new technologies and evolving interests in recreation, along with changing demographics, have outpaced and out-moded traditional management approaches to outdoor recreation. For example, because in the past there generally was room to grow, dispersed recreation was actually encouraged to spread out, the idea being to keep social encounters to a minimum and thereby diluting impacts. This approach instead had the effect of establishing more use in areas that are now easily accessed by more people, with motorized vehicles. This not only has led to a loss in primitive and semi-primitive opportunities, but it spread impacts to previously lesser-used areas. Such incrementalism over the course of many decades has had the
consequence of establishing recreational uses and impacts in unintended places.
Eventually, conflicts arise that prompt some sort of agency action, usually not without controversy, as was illustrated by the case of the Dixie National Forest.

Many managers, partners and members of the public fail to understand these unintended consequences, and continue with actions that may not truly address issues. In the lessons learned on the Dixie, conventional management became less effective in mitigating, reversing and preventing problems, and worse, traditional approaches were alienating to the public that expects to have greater, more collaborative involvement. The agency’s traditional approaches, combined with a number of seemingly independent or disconnected barriers discussed in the chapter ahead, may be causing the Forest Service to act in a manner that is counter to its own sustainability goals and directives.

The following chapter discusses barriers to sustainability. These include a number of issues that distract the Forest Service away from effectively navigating its highly complex and politicized decision making and policy environment. The result is often a falling back to the “default approach” to recreation management, instead of management approaches that would be more socially, economically, and ecologically sustainable.
CHAPTER 4: BARRIERS TO SUSTAINABILITY

An Agency “Caught Between”

“My father [the ranger] was a man born to the land, in a job that sometimes harnessed him to a desk, an Oliver typewriter, and a book of regulations. A man caught between, in a number of ways….The Forest Service itself was an in-between thing, for that matter. Keeper of the national forests, their timber, grass, water, yet merchant of those resources too.”

Narrative by the character Jick MacCaskill, in the novel English Creek by Ivan Doig

Over its first 100 years, the Forest Service experienced many socioeconomic shifts and was required to adjust its focus several times. An interesting, and foreshadowing example was the shift from the agency’s early custodial purpose to providing critical support for President Roosevelt’s New Deal programs. The first rangers and their small staff had accomplished a great deal to locate and organize the National Forests and to regulate its uses, at times with little public cooperation. For the first time, the American National Forests began to be managed through scientific forestry. It was hard work, done in expansive, solitary country. The first managers needed to be self-reliant, rugged individuals. By most descriptions, they were respected, model civil servants; knowledgeable, competent and efficient.

As the Great Depression deepened and President Roosevelt mobilized the Civilian Conservation Corps, the Forest Service was tasked with providing and organizing much of the CCCs’ work. The agency had to rapidly adjust to this new emphasis, making the
Great Depression one of the first examples of a major priority shift for the agency. The Forest Service went suddenly from acting as custodians of vast isolated landscapes and overseers of a limited number of timber sales, to becoming tree planters and developers of new infrastructure: roads, trails and facilities. This dramatic shift came with many challenges, resulting in mixed feelings from those within the agency. Some rangers viewed the New Deal and the CCCs as a bringing prosperity to a suffering nation, as well as to the growth and purpose of the Forest Service. Along with the CCCs came funding, appropriated to the agency in the mobilization of hundreds of thousands of young men who planted trees and built roads, trails, recreation facilities, ranger stations, experimental stations and efficient access for fire suppression; infrastructure that remains part of the National Forest system to this day.

Others saw the CCCs’ as a great interruption to the efficiency of the Forest Service. Early Ranger Elers Koch made the observation that the New Deal programs had a “very profound and undesirable effect on the morale and principles of the Forest Service…government would never get back to the simplicity and economy that characterized [it] before the New Deal” (Koch, 1998). Foresters Aldo Leopold and Bob Marshall, originally excited by the CCC work toward habitat restoration, became critics of its shifting purpose toward resource production, limited-species planting and rapidly expanding recreational developments. CCC activities stimulated criticism by outside individuals and organizations too, resurrecting old battles over preservation verses utilization and development (Maher, 2008).

A further shift came upon the entry of the United States into WWII, when the National Forests played a new role in providing forest products for the war effort. War
demands were rapidly depleting the supply on private lands, creating a need to increase harvesting on National Forests. Even before the war came to a close, FDR and the Forest Service leadership were concerned over destructive logging practices and renewed fears of over-harvesting, and they began exploring efforts to regulate the timber industry, both on public and private lands (Steen, 1991).

Following the war, states and elected politicians acquired tremendous influence in support of the logging industry. Distrust between many Forest Service employees and the industry was mutual. Increasing industrial demands encourage continued agency efforts to push for regulation on logging, regardless of land ownership. This continued into the Eisenhower years, when the executive branch took a more conservative shift, and in 1953 the forest industry finally found cooperation in the Secretary of Agriculture and Chief McArtle. By this time, Gifford Pinchot had passed away (1946), and many of his early Yale rangers had retired. Chief McArtle worked toward ending regulation pressures, and the agency would never act again as an outward advocate of industrial regulation. At that point, the timber industry became an integral part of national forest policy and practice, and a working relationship developed to provide a continuous supply of wood to meet society’s demands. For another 35 years, production forestry continued as a primary purpose of the agency, even as its work mingled with Multiple Use and environmentalism (Steen, 1991).

Kennedy and Quigley (1994) described a “midlife crisis” occurring in the agency during the 1960s and 1970s. Kennedy and Quigley pointed to a new diversity growing within the agency, new interdisciplinary processes, and new requirements for public participation as catalysts in the agency’s evolving purpose. In the words of these authors,
for next two decades, “the Forest Service went through stages of denial, confusion, and mourning for the good old days when it was an elite forester fraternity with a clear purpose and a national mystique. It also received mixed messages during this time from conservative administrations, commodity-oriented budgets, a postindustrial American society with growing environmental demands, and from its own employees. Despite these mixed messages, the agency has moved unevenly but inexorably toward environmental values and a new maturity signified in the ecosystem management paradigm.”

Kennedy and Quigley went on to compare the paradigms of the 1950s and 1990s Forest Service. They described the 1950s Forest Service as following a “machine model” view of reality. This model “sees the world in simple, compartmentalized, cause-effect, goal-oriented, and mechanistic terms that can be understood separately by standard efficiency or optimization analysis (Kennedy and Quigley, 1994; Kennedy et al., 1995; Schiff 1966; Taylor 1957). The Forest Service machine-model thinking was manifested in: (1) narrow forest ecosystem perceptions (e.g., simple site-productivity models), (2) forest or fire management (e.g., intensively managed plantations, forest pest wars, or out before 10 AM fire rules), (3) agency organizational structures (e.g., line-staff, generalist-specialists, or strict functionalism), (4) organizational processes (e.g., Kennedy and Thomas’ 1992 ‘dog’ loyalty to line, mechanistic employee-spouse-children response to Forest Service transfers), (5) public relations (e.g., benign and educated Forest Service professionals managing National Forests for the uninformed, self-centered public and for future generations), and (6) functional, reductionist research scientists and their projects. Control-oriented people and organizations find comfort in a machine-model world (Schiff
1966). Ironically, complex postindustrial societies, created by the simpler industrial eras of the first two-thirds of this century, have made machine-model thinking obsolete.”

Kennedy and Quigley felt that more complex, diverse, and interrelated “organic” models are necessary to understand and adapt to today’s world. The nation’s socio-political changes would require the Forest Service to discard simplistic “machine” models of reality for “organic” models such as ecosystem management, and to resurrect Forest Service employees Aldo Leopold and Bob Marshall as respected role models along with Pinchot (Robertson, 1991). Kennedy, Dombeck and Koch (1995) condensed Kennedy and Quigley’s comparison of the “machine” and “organic” models into the following table:

<table>
<thead>
<tr>
<th></th>
<th>MACHINE MODEL</th>
<th>ORGANIC MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 75 years of twentieth century</td>
<td>Perspective: world composed of simple, independent systems</td>
<td>Perspective: world composed of complex, self-organizing, highly integrated systems</td>
</tr>
<tr>
<td></td>
<td>Aim: reduce systems complexity by isolating and separating subsystems</td>
<td>Aim: understand integrated, interrelated systems organization and processes</td>
</tr>
<tr>
<td></td>
<td>Linear, cause-effect systems organization and processes are the norm</td>
<td>Multifaceted and cumulative effect, cyclical and synergistic systems relationships are the norm</td>
</tr>
<tr>
<td></td>
<td>Use of deductive logic and simple efficiency optimization models appropriate</td>
<td>Use of inductive, integrative logic and complex, inclusive simulation models appropriate</td>
</tr>
</tbody>
</table>


Kennedy and Quigley recommended several changes to achieving and rewarding “organic” model ecosystem management goals within a “machine” model planning system for planning, targeted budgeting, and traditional organizational structures would fail. These authors made recommendations for a cultural evolution within the Forest Service. They recommended diverse teams and diverse training toward the development
of an ecosystem management paradigm. They recommended the development from an output orientation to a sustainable desired conditions orientation, less top-down and more bottom-up, coming from the District and Forest levels.

Kennedy and Quigley further recommended a shift from a line-item, output oriented budget to one that is based on achieving desired conditions of ecosystem management. They recommended a reward and organizational system that “enhances diverse, adaptable, and sustainable ecosystems, organizational cultures, and output and user services. Such an organic-model reward system in an ecosystem management era would accommodate risk-taking, entrepreneurship, and team processes and would pivot on the core-value of enhancing diverse, sustainable ecosystems, user systems, and organizational cultures.”

Today, the agency’s national goals revolve around the concepts of sustainability, stewardship and collaborative processes, which seem consistent with the organic model described above. The National Report on Sustainable Forests—2010 (USDA, 2011c) explains the latest shift in agency focus and policy. According to the report, the agency is concerned that substantial fragmentation and losses of forest land is occurring, particularly in areas adjacent to growing urban areas and where recreational development is prominent. The agency also believes that people are becoming increasingly disconnected from forests, people are spending less time outside engaged in physical activity in the woods (USDA, 2011c). There is great concern that that public support for conservation and management is reaching dangerously low levels. The National Report goes on to state that “capacity and capability to manage forests and rural landscapes will require a new and collective conservation ethic. Not only would this ethic enhance the
The National Report on Sustainable Forests (both the 2003 and 2011 publications) is based upon the Montreal Process discussed earlier in this paper. The report used a set of seven criteria and 67 indicators developed by the Montreal Process Working Group. The report explained that the Montreal Process criteria and indicators have withstood a decade of extensive scrutiny by members of the scientific and policy communities, as well as from practitioners working at different spatial scales, ranging from the international to the local level. In the way the report organized the data sources and scientific efforts underway in measuring the state of the National Forests, it provides a hierarchical structure to the science of sustainability (USDA, 2011c).

The report described the interconnected and interdependent three “arenas” in which the effects of natural resource decisions are closely linked: environment, society, and economy—referred to in the report as the “triple bottom line”. As also mentioned throughout this paper, this triple bottom line is required for sustainability management. The National Report further explained that the benefits of nature are irreplaceable and that the entire economy is reliant on society, which in turn is entirely dependent on the environment (USDA, 2011c).

The report identified seven driving forces affecting forest sustainability, which often overlap and interact with one another: 1) climate change; 2) globalization; 3) biomass energy demand; 4) urbanization and related shifts in land use patterns; 5) forest fragmentation and parcelization; 6) loss of working forests; and 7) altered disturbance
patterns. The report also stated that attitudes and beliefs by the public affect how forests are conserved, used, managed and protected. The report proposed that resource managers need to recognize the importance of values and beliefs, and they need to work at managing the social dimensions as well as the ecological and economic dimensions of sustainable forests. The diverse set of recreation activities portrayed in the indicators could be a primary source for extruding information about these values and beliefs, as well as providing a platform for making connections, attachments, and appreciation for the landscape. These are the necessary ingredients for stewardship and sustainability, and the basis for actualizing Leopold’s land ethic.

The National Report on Sustainable Forests suggests that many of the recommendations made nearly 20 years ago by Kennedy (et al) have materialized in the modern Forest Service. However, it is not certain that these goals resonate in the field in terms of a clear management objective or carrying out “the mission”. There seems to still be a conflict between organic and machine-model thinking at the field-level. While there has been remarkable evolution in the agency, there remain cultural characteristics and barriers to communicating national strategies to the field. Conditioned agency behavior and conflicting expectations continue to cause disintegration across programs, difficulty in comprehensive target accomplishment, and diminishing team cohesion. The following discussion identifies a number of factors that affect agency effectiveness, employee satisfaction, and overall morale. These barriers may encourage a continuation of the default approach described by Blahna (2007), therefore calling into question the ability of the agency to meet its sustainability, stewardship and collaboration goals.
An Iconic History

“Wanted—Brave Young Men!”

“To the man who likes the life in the open, who loves the wilds and the dangers attached, there is no better opening than that which is afforded as Ranger on the National Forests.”

1909 Article by M. Beverly Buchanan in Technical World Magazine

Many agency employees place tremendous importance, even reverence, upon the agency’s history and former capability. Forest Service history, and the view of one’s place in it, is a core identity for many agency employees (Dialogos, 2008; University of Washington, 1994). Depending on personal interests and associations, some employees may identify with the early Progressive era days; images of Pinchot, the establishment of the National Forests from a literal frontier of wildlands, use of traditional tools and horses, adventure stories from early rangers’ journals, the fires of 1910, and so on. Other employees may be more interested in the Great Depression, the New Deal and organizing the CCCs. Still others associate themselves with the post-WWII era of high production of commodities and facilities, embracing technology, science and engineering.

This identity has been a source of pride for many employees, reflecting efficient government and the can-do spirit that embodied the Forest Service. The old times and ways may seem distant and are potentially becoming irrelevant to newer field employees as well as policy specialists, and their personal and professional identities may be less
tied to those images. In effect, they may be more loyal to their resource than to agency traditions (Lewis, 2005).

**Conflicts in Organizational Structure**

In 1905, Chief Forester Gifford Pinchot and Secretary of Agriculture James Wilson emphasized that conservation and "wise use" would be the guiding principles of the agency. In his famous authorizing letter to Pinchot, Wilson expressed that these principles could best be applied and pursued "only when the administration of each reserve is left very largely in the hands of the local officers, under the eye of thoroughly trained and competent inspectors." Thus, the agency’s policy of a decentralized administration was set in place (Forest History Society, 2012; USDA, 1988).

The decentralized organization largely applied to the field, where Forest Supervisors and Rangers were authorized to carry out orders as they best saw fit. Within the decentralized system, a command-and-control structure emanated from headquarters in Washington D.C., employed as the means for disseminating policy, authorities, and instructions for conducting duties in the field (Forest History Society, 2012; Kaufman, 1960; Koch, 1998; Lewis, 2005; Steen, 1991; USDA, 1988).

This organization involved a traditional administrative pyramid including line officers, functional staff, a chain-of-command, issuance of orders, duty stations, transfers, details, and so on; very military in its terms and structure. As defined by the Department of Defense Dictionary of Military and Associated Terms (2010), command-and-control is “the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission”. Authority and
responsibility to issue policy and allocate the budget is given by Congress and delegated by the Secretary of Agriculture to the Chief, and downward through a chain of Regional Foresters, Forest Supervisors, finally reaching District Rangers. These agency line officers supervise a set of staffs, to which they delegate the responsibility of carrying out various policies and direction for the planning, operations, and accounting for expenditure of funds. Staffs at the regional and forest levels define and interpret the national policy and issue direction to apply it to the local units, and the Forest Supervisor disseminates instructions to District Rangers and staff officers (Forest History Society, 2012; Kaufman, 1960; Koch, 1998; Lewis, 2005; Steen, 1991; USDA, 1988).

This has proven to be an efficient model, particularly in the early days when it was difficult to consistently provide direction to the remote stations in the field. District Rangers arrived at their duty assignments prepared with training and education, through university degrees, “details” served at headquarters in Washington D.C., and certified proficiency demonstrated through a civil service exam. They implemented work on the ground, as guided by the policy tenets of the “Use Book” (The Use of the National Forests). Pinchot deemed these methods as essential to administering work in the field with a high degree of consistency, competence, and efficiency (Kaufman, 1960; Koch, 1998; Lewis, 2005; Steen, 1991; USDA, 1988). Agency instructions or “orders”, another military concept, were delivered to the field via letters, telephone, and telegrams (Koch, 1998; McKay, 1994). The Ranger in turn directed his assistants, who led crews to get the work done.

When the Great Depression hit, and Forest Supervisors, Rangers and their men became highly involved with the Army and the paramilitary structure of the CCCs.
Many young men working for the Forest Service and the CCCs served their country in WWII, became foresters and were employed by the agency after the war. The military structure was natural to the employees coming into the agency following WWII. Freshly college-educated G.I.’s entering the agency’s workforce knew how to conform under the chain of command and follow orders toward the accomplishment of the mission (Lewis, 2005). Command-and-control served the agency well through the production period as well, especially under the Incident Command System utilized to rapidly organize for emergencies such as wildfire, catastrophic hurricanes and flooding. Even in emergencies however, the agency is realizing how critical community involvement and direct, honest communications are to preventing public backlash, accidents and fatalities of crewmembers, and in saving public lives and property (Dialogos, 2008).

No longer does the Ranger’s staff primarily include a simpler set of local temporary hires, forest guards, resource assistants, and clerks to carry out various administrative duties, construct trails and facilities and oversee range, logging and special use operations. A larger number of specialists are now required to conduct environmental analyses and plan, inspect, and monitor project work. Allocated funding is often inadequate to support full teams at the District and even the Forest level, resulting in zoning of these resources across distant administrative boundaries. Additionally, many Forests now operate under a “unified budget” approach, where decisions and priorities are determined from a broader perspective, with budgets no longer allocated directly to Districts. Budgets are allocated by resource area, such as timber, range, recreation and roads, with some budget becoming more integrated and shared for managing multiple resources. In many regions of the country, current budgets are inadequate to cover
needed staff. These realities, along with the rising costs associated with maintaining facilities and operations at more remote offices, is increasing the distance between teams of employees, and to the actual forest, eroding the former efficiency of the decentralized structure of the agency.

These circumstances currently complicate the span of control held by the District Rangers, requiring a more cooperative approach and a willingness by individual line officers to share their decision space with other members of the forest’s leadership team and staff. There is no formalized structure directed for this approach, so many forests are exploring different business models to find ways to make this work. Some forests have been more successful in making this work than others, depending on local conditions and the attitudes, beliefs, skills and behaviors of the leadership team involved. It is a complexity that is difficult to identify and define, but the problem has been demonstrated as having a serious impact on agency effectiveness.

**Shifting Management Paradigms**

Earlier eras were very task-oriented for the Forest Service and did not require the complex and intense levels of environmental analysis or public involvement that came about during the Ecosystem Management era. Managers operating under Ecosystem Management experienced a major adjustment, not only in the agency’s purpose, but in its changing workforce. A series of studies by Brown and Harris revealed changing paradigms occurring in the Forest Service with the agency’s new programs under Ecosystem Management (1992a, 1992b, 2000). These researchers studied whether an “alternative” management paradigm existed among Forest Service employees, sought to
characterize the new paradigm and its impacts to the agency, and to understand to what extent the agency had embraced the new paradigm. They surveyed three groups of Forest Service employees in 1990: 1) 1260 members of the Association of Forest Service Employees for Environmental Ethics (AFSEEE); 2) line officers (not members of AFSEEE) consisting of 350 randomly selected district rangers, all 127 forest supervisors, and all 9 regional foresters; 3) 945 random selected agency staff employees (also non-AFSEEE members). The staff and line distinction among non-AFSEEE members was made to minimize bias and because it was known at that time that there were very few line officers who were members of AFSEEE. The study resulted in a roughly 80% response rate. Significant differences existed between AFSEEE members, line officers and general staff, with 89% of AFSEEE members leaning toward a non-commodity orientation for the agency, and less than 60% of line and general staff agreeing with that perspective. 89% of AFSEEE members also preferred an agency emphasis on preserving ecological integrity, verses 42% of line officers and 51% of staff in agreement. Interestingly, all three groups perceived the agency’s position to be low on the preservation of ecological integrity and very high on the production of commodity goods and services. AFSEEE members tended to be slightly younger (39 years verses 46 years, and 41 years old, respectively) and less experienced than the line and staff samples (12 verses 16 years and 22 years, respectively).

The Brown and Harris survey also portrayed a diversifying agency: 38% of AFSEEE members were female, whereas only 20% of the staff and 10% of line officers were female. AFSEEE members represented a wider diversity of professions, with 23% of AFSEEE members identifying themselves professionally as foresters, whereas 43% of
line officers and 40% of staffs were foresters. 21% of AFSEEE members identified themselves as wildlife biologists or fisheries specialists, but only 5% of line officers and 11% of staffs identified themselves as such. 14% of AFSEEE members were recreation specialists, and only 7% of line officers and 9% of staffs were identified as recreational professionals. Overall AFSEEE members had high representation of non-commodity natural resource and amenity managers; significantly higher than those in the line officers and staff samples (Brown and Harris, 1992a, 1992b, 2000).

In 2010, Brown et al. updated these studies with the publication of a longitudinal survey on changes in attitudes, beliefs and preferences of Forest Service employees, covering 1990 to 2008. These researchers observed that a transition had occurred that had moved the Forest Service from a timber-dominated organization to an agency that is struggling to cope with its post-timber reality. The 2010 study showed a considerable narrowing of the gap between Forest Service employee preferences and their perception of the position of the agency on key management issues, identified in the 1992 study. A higher degree of favorability toward timber harvesting was also found than had existed before, even among those who were members of FSEEE (formerly AFSEEE). Agency employees appeared to be unified in their frustration over gridlock in planning and management, largely imposed by external courts of law, and they desired a greater balance between the timber boom of the 1980s and the bust of the 1990s, according to Brown et al. (2010).

While the earlier studies demonstrated a “palpable energy among agency employees as they debated the agency’s future in the face of changing forest conditions and social values”, the updated study showed that by 2008, “the Forest Service had been distracted
from new resource management directions to more pressing problems besieging the agency, including employees who had grown increasingly discouraged and whose morale was as low as ever”. The agency’s focus had gone from a discourse about forest management direction to grave concerns about organizational and work-related issues (Brown et al., 2010). New organizational circumstances have led to deep dysfunction, including a reduced workforce, an exodus of employee technical expertise, declining resource budgets, reorganization initiatives, and the ascendancy of fire management (currently accounting for half of the agency’s budget and the repeated transfer of funds from other programs) have had major impacts on agency programs and employee morale (Brown et al., 2010; Davidson, 2009; Dialogos, 2007, 2008; Kashdan, 2009; MacCleery, 2008; Paskus, 2009; Partnership for Public Service, 2009).

Brown et al., further identified a number of external events that have occurred since 1996 (e.g., global climate change, increased catastrophic wildfires, implementation of the Northwest Forest Plan, and changing political administrations), new agency initiatives (e.g., the Healthy Forests Initiative, revision of Code of Federal Regulations planning rules in 2005, consolidation of administrative services at the Albuquerque Service Center, and growing public involvement in National Forests management have created major challenges for the Forest Service. Brown et al., pointed to these as indications of a growing inability to fully and effectively respond to its changing natural, social, and political environment, and this is of great concern to agency employees. Brown et al. (2010) also referenced other sources that identify and corroborate these concerns. Dialogos International (2007; 2008), for example, was contracted to evaluate fire management safety issues within the Forest Service, but their investigation resulted in the
identification of central dilemmas in the “agency’s cultural DNA” that suggested a dysfunctional organizational culture and resistance to change in the agency. Brown et al. also referenced the Forest Service’s extremely low Best places to Work rankings (Partnership for Public Service, 2009, 2011, 2012), described in further detail ahead. Brown et al. concluded that ongoing issues identified over decades of comprehensive studies of Forest Service employees and agency challenges have yet to abate (Brown et al., 2010).

A Changing Workforce

“I often think what a wonderful thing it was to have a Government bureau with nothing but young men in it. Most of the men, aside from G.P., Price and Potter, were in their twenties, and there was no sign of Departmental inertia or red-tape inhibitions in our cosmos. I believe much of the efficiency for which the Forest Service has been notable among Government bureaus was due to this condition. With the lapse of forty years, our Service has grown old, and the men in it. I sincerely hope that the present retirement policy will help to rejuvenate the Service, and that in filling vacancies seniority will not be given too much weight.”

Memoir of Elers Koch, 1944—In Early Days in the Forest Service

There are four identified generations remaining in today’s workplace: these are known as the Traditional Generation (1922-1945), the Baby Boomers (1946-1965), Generation X (1966-1979), and Generation Y (1980-forward), also known as the
Millennials. The birth-dates representing each generation may vary slightly, depending on the information source. The Forest Service, being an old organization, has spanned all four working generations. The agency culture was founded on many characteristics and values of the Traditional generation. This generation was shaped by the Great Depression and WWII. This generation produced people who tended to be very hard workers, generally liking formality and top-down chain of command, looking for respect but willing to pay their dues, loyal, and highly dedicated to their work. They tended toward consistency and uniformity, seeking out technological advancement, but at the same time tending to be past-oriented. They worked well with command-and-control leadership styles and hierarchical organizational structures. At this time, most of the Traditional Generation has retired, but a few members still remain at work.

The Baby Boomers were influenced by the social turmoil of their time (i.e. civil rights, the Vietnam War, Kennedy, the Space Race, the Cold War, Watergate, Woodstock, and environmentalism). Like their predecessors, they too tend to be hard workers, brought up to respect authority figures. However, failures by authority figures taught them not to “trust anyone over 30”. They grew up in an era of tremendous prosperity, saw their generation as changing the world, and therefore tend to equate their work with self-worth, contribution and personal fulfillment. Baby boomers often believe that hard work and sacrifice are the price one pays for personal success, and they are the one that modeled the workaholic trend. They tend to be process-oriented task completers who want their accomplishments to be recognized. Although it was this generation that challenged authority, they tend to value the chain of command. This generation presently
holds most of the senior leadership positions, and its members are in the mid-to-late part of their careers or have already entered retirement.

Generation Xers are the children of the older Boomers and the last of the Traditionals. This generation was shaped by the Iranian Hostage Crisis, MTV, AIDS, the space shuttle, the Savings and Loan scandal, the fall of the Soviet Union, Desert Storm, and the Los Angeles riots. They grew up during a period of financial, familial and social insecurity. They watched their loyal, workaholic parents be laid off from their jobs, and saw the decline of American power in the world. They witnessed corporate downsizing, limited wage mobility, and are the first generation to be expected to earn less than their parents did. They grew up in single-parent homes or homes where both parents worked, and as latch-key kids, became self-reliant. They tend to aspire more than previous generations for work-life balance, are more independent and autonomous than previous generations. They may be less loyal to their employers; however, they value employers who facilitate continuous learning and skills development for employees. They also work long hours, are results-focused, but are ruled more by a sense of accomplishment than by the clock. They adapt to change, accept diversity, are pragmatic and creative, and enjoy a little fun at work. Although they are individualistic, they value teamwork and collaboration more than did their Boomer predecessors.

The Millennial Generation is made up of the children of the Baby Boomers, and is so-called because its members came of age near the beginning of the Millennium. They are confident, optimistic, young adults, brought up in the most child-centric period so far. Several studies identify their childhoods as the main difference from previous generations. Millennials were raised in an atmosphere where everyone is a winner, yet
taught that they are special, and often sheltered by hovering, protective “helicopter” parents (Millenbaugh and Wolter, 2009; Twenge et al, 2010).

Millennials can be obsessed with grades and performance, but they often possess a consumer attitude toward education; higher education is a product that they have paid for. They often expect extra individual attention to help them achieve success. Millennials may lack awareness of the concept of paying one’s dues and therefore may have unrealistic expectations as they enter college and the workplace. Many expect to establish careers and earn large salaries right out of college (Millenbaugh and Wolter, 2009). However, the current economic recession and high current unemployment potentially has affected this expectation.

Most Millennials have had technology embedded throughout their daily lives, even more so than Generation Xers who are generally comfortable with technology. For Millennials, life with wireless communications, portable media, computers and the Internet, is second nature. They also tend to possess a more global perspective. They are more adaptable to change than even Generation Xers; they embrace rather than just accept diversity, and after seeing employers’ lack of loyalty to the previous generations of workers, they generally have little or no expectation of long-term, stable employment with the same organization (Simons, 2010; Tolbize, 2008; Twenge et al 2010).

Millennials work long hours, as did their predecessors, but their purposes in doing so may differ. Millennials appear to place less value on intrinsic rewards, such as finding meaning through interesting and rewarding work, than did the previous generations (Twenge et al, 2010). Millennials arguably work long hours due more to a desire for extrinsic rewards (income, advancement opportunities, and status), particularly since they
have experienced higher educational costs and dual-income households more than previous generations. However, they generally place highest value on their families, friends and personal activities, and need flexible schedules that facilitate their social lives and both working parents. They “work to live” instead of “living to work” (Tolbize, 2008; Twenge et al., 2010).

Millennials stay connected to friends and family through social networking. They may not be inclined to develop relationships with people in the workplace as much as previous generations did. On the other hand, Millennials are the most teamwork and collaboration-oriented of the generations (Twenge et al., 2010; Twenge, Campbell and Freeman, 2012).

These are generalized descriptions of the four working generations. Although other factors such as gender and racial diversity were not explored here or in the literature used for reference, those would be recognized among important factors that might influence variety in the stereotypes discussed above. Also, some of these characteristics may be more prevalent in the corporate working world than in the Forest Service. It seems that students and young workers entering the agency have many values in common with previous generations, based on a characteristic profile by Sharik and Frisk, discussed ahead. These revolve around a love of the outdoors that is likely bridge the generations, for which no literature appears to exist. That being said, generational differences do have implications for the Forest Service organization, potentially affecting agency culture and with some incompatible expectations between older and younger workers.

Consistent with the values of the Traditional and Baby Boomer generations, many of the agency’s senior employees and leaders came up in an agency that focused on
individualistic competencies. They built their careers upon the accumulation of specialized knowledge and technical skills, which were developed and rewarded under a top-down organizational, structure, and they likely impose a similar expectation on younger workers. This may not be consistent with a changing workforce, however:

“In general, employees want to be recognized for their work, use their talents, have an impact, feel empowered, receive support and have opportunities for growth. They want to have good relationships with their supervisors and colleagues, as well as a sense of teamwork and shared mission.” (Partnership for Public Service and Booze Allen Hamilton, 2011).

There have been a number of publications since the 1990s calling for the Forest Service to develop a more collaborative competency for an improved public involvement and interdisciplinary team atmosphere (Wondolleck and Yaffee, 2000). A 1994 research report conducted for the Forest Service by the University of Washington discussed the impact of policies and mythologies held by the Forest Service. This report explained that trust and teamwork have been severely eroded by employee frustrations that under the top-down structure, decision-makers do not consider expert advice, and do not respect lower level decisions. Furthermore, employees believe that team approaches to decision-making have been controlled by legal threats, developing a desire by many decision-makers to control information and pre-decisional dialogue. According to this study, such circumstances have driven agency employees to become advocates more for their specialty than for the agency, compelling some to partner with external forces in order to influence resource decisions (University of Washington, 1994).
In a paper by MacGregor and Seesholtz (2008) the authors explained that District Rangers are becoming increasingly sensitive toward the need to improve community relationships in their efforts to improve natural resource conditions. However, this can be a complex and iterative process, requiring significant investments of time and effort to complete. This reality may not be well accepted by higher levels of leadership, and may not allow for timely target accomplishment, under an annual budget process. Coupled with concerns over losing to appeals and litigation, there is a disincentive to decision-makers who wish to avoid compromising their image as an effective leader and manager. A 2005 study by Kennedy et al. found that risk-taking and innovation were among the least rewarded values held by decision-makers (MacGregor and Seesholtz, 2008).

Davenport et al. (2006) also discussed institutional constraints to community involvement by Forest Service employees. The authors explored the roles of lower-level staff in developing and maintaining collaborative opportunities. They referred to Hendee (1984) who suggested that relationship building in local communities, in some cases, means formal meetings between forest managers and community officials, but it occurs more commonly through informal, day-to-day interactions and exchanges between on-the-ground staff and landowners, business operators, and residents. Davenport et al. also cited Wondelleck and Yaffee (2000), who identified a “lack of administrative flexibility” and “constrained resources” as institutional barriers to working collaboratively with the greater community. The result was persistent distrust between members of local communities and the agency, described as having taken a toll on these critical relationships, as well as on employee morale.
In their work, Wondelleck and Yaffee (2000) described the agency’s tendency toward a technocratic model of public involvement: “tell us your concerns, and we will figure out a solution”. This approach, and an over-reliance on scientific and technical answers to solving problems, has led to frustrated outside groups developing the ability to collect and analyze information so that they could effectively challenge agency decisions on scientific grounds. This resulted in the “wresting” of the agency’s control over decision making, particularly through the courts, by undermining its primary source of legitimacy. At the same time, the agency has been slow to engage in the collaborative processes needed to develop solutions with outside groups. Instead of building understanding and developing longer-lasting solutions together, the agency often tends to default to the minimum public involvement approach of collecting of comments and imposing its view of the best alternative (Wondelleck and Yaffee, 2000).

These characteristics are contributing barriers to building effectiveness in collaboration, public involvement and empowerment of employees. Younger employees may be confused and disappointed by the old way of doing things. They may also be frustrated by risk-adverse behavior in leadership, attempts to control outcomes, the limited extent that collaborative processes enter into internal operations and public involvement. Younger workers may also have a much different view of what is “broken” in the agency. While their predecessors may mourn the passing of the old days and ways, younger employees are not likely to have the same attachments to the previous organizational structure and norms.

Although the top-down structure was efficient in the past, it does not have the same effectiveness for integrated resource management and working with collaborative
processes. Younger workers, especially those now graduating from natural resources programs, may bring a different set of skills and expectations to the Forest Service. Many of today’s natural resources degree programs involve a “human dimensions” curriculum, including collaborative processes, which are needed for working with an ever-changing, diverse public and internal organization. Incoming employees could be frustrated by institutional problems within the Forest Service. Inadequate budgets, pressure to reduce the size of the federal government, and the agency’s top-down structure may limit opportunities for employees to develop and improve the agency’s experience in collaborative and integrated processes. A failure to understand different values and expectations between the generations could also contribute to the agency becoming more irrelevant to the public it serves, inadvertently promoting potential recruitment problems.

Perhaps surprisingly, the ability to meet the needs of the future becomes increasingly difficult with employee attrition. The Forest Service, and the federal government as a whole, has sounded an alarm for many years over a looming wave of retirements that would inevitably lead to loss of competency and a high number of vacancies in “mission critical” jobs. Brown and Harris too had anticipated a significant organizational shift in agency culture that would occur as senior employees entered retirement. This loss of competency, often referred to as “brain drain” would continue in waves to impact the agency for years to come (Partnership for Public Service, 2005; USDA, 2011d).

In 2008, nearly 500,000 federal employees were over 55 years of age and it was anticipated that over the following five years, 1/3 of the permanent federal workforce would retire. Current downsizing initiatives with the purpose of federal debt reduction
are expected to affect this scenario even further. This means loss of technical skills, administrative and organizational knowledge and the ability to mentor to new employees entering the workforce. This departure of intellectually or technically skilled personnel is often referred to as “brain drain” (Partnership for Public Service, 2005). When good employees leave an organization, they take with them their accumulated skills and experience, which deteriorates organizational identity and culture (MacCleery, 2008; Partnership for Public Service, 2005; 2008; Partnership for Public Service and Booze Allen Hamilton, 2010, 2011).

Fewer available entry-level employees is also a concern that the agency may not be thinking about. This would be due to declining enrollment in natural resources disciplines, reported to be at its lowest in the early 2000s. Although undergraduate enrollment in natural resources programs has risen since that time, it remains 13% lower than it was in the 1980s (Sharik and Lilieholm, 2010). Enrollments in natural resource undergraduate programs declined by 4% per year from the mid-1990s to the mid-2000s, despite increasing demand to fill voids being left in public state and federal agencies, and nonprofit groups by retirement (Wolter et. al, 2011).

Sharik and Frisk (2011) examined declining enrollments in the discipline of forestry. They examined a variety of factors affecting student enrollment: (1) uncertainty in the existence of jobs; (2) low salaries compared with other professions; (3) an increasing disconnect between society, particularly young people, and natural resources (in turn due to increased urbanization); (4) tendency of minorities to avoid academic programs that are not perceived as addressing important issues affecting their communities; (5) negative public perceptions of the forestry and related natural resource professions; (6) perception
of curricula being too narrow and rigid; (7) increased “science phobia” on the part of students; (8) increasing numbers of similar degree programs outside of colleges of forestry and natural resources; (9) a relatively long period beyond a bachelor’s degree required to obtain a terminal professional degree; (10) a lack of intellectual leadership and charisma nationally in the forestry and related natural resources areas; (11) inadequate education on the part of the public regarding benefits of the forestry and related natural resource professions to society at large; and (12) decreasing enrollments in colleges and universities.

Sharik and Frisk described a characteristic profile of enrolled forestry students as a person who loves working outdoors and has a deep affection for and interest in nature, in part resulting from having experienced nature in childhood and adolescence; has a strong interest in natural science and forestry academic subjects; has a strong conservation ethic; and is committed to making a difference through sustainable management of our nation’s forests. Wolter et al. (2011) investigated enrollment in fisheries and wildlife programs, and felt that their findings, which closely aligned with the Sharik and Frisk research on forestry, were applicable to many other natural resources based programs across the nation. These studies each found that an affinity for the outdoors is a strong motivator in student selection of natural resources disciplines as a major. This characteristic seems to bridge the working generations.

Attrition could further deplete significant and specialized knowledge, waste investments made in training and developing experienced employees, leaving behind a further demoralized workforce, making it difficult to recruit and keep new talent. This concern was expressed by Sharik and Frisk (2011) in their statement, “A dwindling
workforce could have serious implications for the future of natural resources management and sustainability. Moreover, without an ongoing supply of graduates in natural resource fields to populate positions in various land management agencies and NGOs, the health of ecosystems is likely to erode, and in turn the health and well-being of humans.”

**Declining Budgets**

A review of its history shows that the Forest Service has often been underfunded and understaffed for meeting its purposes. An exception to that reality was the post-WWII production years, when the overall agency budget was substantially augmented by the sale of timber. The roads, trails and facilities developed during the production period were generally constructed for and through timber production. The appropriated recreation budget was therefore largely supported by timber, as well as through the production of other commodities (i.e. off-shore oil support toward the Land and Water Conservation Funding). Subsequently, this funding has been reduced since the 1990s’ severe decline in timber production and increase in other budget priorities. In the 21st century, the budgetary emphasis on the built environment has been on reducing deferred maintenance and addressing public health and safety, to be accomplished through appropriated construction and maintenance funding.

The Forest Service Budget Justification for Fiscal Year 2013 calls for an emphasis on President Obama’s America’s Great Outdoors and the First Lady’s “Let’s Move” initiatives, aimed at reducing obesity in the United States. It directs the implementation of the Forest Service’s Framework for Sustainable Recreation. However, dramatic
decreases are expected to continue over the coming years in facilities, roads and trails funding. At the time of this writing, deep budget cuts are occurring due to the federal deficit and across-the-board limits on federal discretionary spending, known as “sequestration” (Abbott, 2013; Congressional Budget Office, 2013; USDA, 2012g). This reduction will place a tremendous strain on the overall recreation budget.

The FY13 facilities budget will continue to emphasize eliminating health and safety risks at agency-owned buildings and recreation sites and reducing critical deferred maintenance on the aging infrastructure. The roads budget will emphasize road decommissioning associated with restoration work to the Integrated Resource Restoration budget line item. The trails budget will focus on the designation of trails for motor-vehicle use, strengthening partnerships in trail stewardship, and delivery of youth programs. However, overall appropriations for construction and maintenance are sharply declining, becoming inadequate to cover fixed costs, let alone emphasized projects and newer initiatives. This funding crisis within the agency is exacerbated by a current political climate that is targeting discretionary domestic programs to address the federal deficit (Abbott, 2013; Congressional Budget Office, 2013).
Slipping Morale

The preceding discussions cover a number of facets that are affecting agency morale. Several additional factors are documented through papers and testimonies given before congressional committees in recent years. The downsizing of the mid-1990’s under Reinventing Government, outsourcing of internal services to private contractors, poorly-designed, poorly-tested, poorly-functioning data and accounting systems, centralization of business and human resources to a service center in Albuquerque, New Mexico, and computer IT (information technology) services to a central, outsourced helpdesk have all been identified as contributors to declining morale. The transferring of so many tasks previously handled by local support services to field employees under “self-service” is a problem known in the agency as “burden shift”. Ever-increasing fire suppression costs that currently account for half of the agency’s budget, transferring funds year after year from other programs, have resulted in employees lamenting the conversion of the Forest Service to the “fire service” (Brown et al., 2010; Davidson, 2009; Dialogos, 2007, 2008; GAO, 2011; Kashdan, 2009; MacCleery, 2008; Paskus, 2009; Partnership for Public Service, 2009).

While internal recruitment to leadership positions has continued, more authority has been shifted to politically-appointed undersecretaries of the USDA. Forest Service chiefs, although selected from the ranks of agency leaders, routinely change with each new presidential administration, which often impose inconsistent shifts in policy and focus (Thomas, 2011). Agency transfer and promotion policies that maintained employee conformance, greater objectivity and increasing the base of experience for agency professionals also have a downside: it can lead to lost local relationships, team
cohesion and on-the-ground knowledge, and disruptions in leadership (Davenport et. al, 2006; Kaufman, 1960; USDA, 1990a).

These problems have been discussed in a body of social research spanning more than 25 years, and many were noted contributors to a 2009 survey showing low ranking in employee satisfaction and commitment in the federal government. The Forest Service placed 206th out of 216 federal agencies, ranking only 209th in the category that measures the level of respect employees have for senior leaders and staff perceptions about senior leaders' honesty, integrity and ability to motivate employees. Low morale ratings continue to be a concern for the Forest Service (Brown et al., 2010; Davidson, 2009; Partnership for Public Service, 2009, 2011).

**The Legal Arena and the “Gordian Knot”**

In a two-part article by Jack Ward Thomas titled *The Future of the National Forests* (Thomas, 2011), the former Chief described “the tangled web that is strangulating the agency’s ability to manage the National Forests” (editor’s introduction). Thomas referred to this as an intractable Gordian knot, an intricate problem or predicament that is insoluble in its own terms. He described a future of reduced funding to an agency already strapped beyond its capacity, while demands for goods and services provided by the National Forests increase along with population growth and consumption. In his synopsis of events affecting Forest Service effectiveness, Thomas referenced Clarke and McCool’s seven factors that once identified the agency as a “bureaucratic superstar” (1996): 1) a pro-development multiple-use mission, 2) a pragmatic, utilitarian philosophy, 3) a clear beginning, 4) a scientific base of expertise, 5) internal recruitment
to leadership, 6) a coherent, well-defined public image, and 7) strong support from Congress, and sometime the chief executive) emanating from well-organized constituencies.

Thomas went on to describe the occurrences since Clarke and McCool’s 1996 writing that have deteriorated the agency’s high performance (Thomas, 2011). He described a public and political shift from pro-development and multiple-use toward preservation. In Thomas’ words, “pragmatic utilitarianism was eroded by legislation, case law, changes in public opinion coupled with shifting, confused, inconsistent and dysfunctional political direction. The clear beginning evolved into a “creation myth” then faded into memory. Scientific expertise increased, though support eroded [and] new knowledge became more fiscally and politically difficult to integrate into management. Internal recruitment to leadership positions continued while more and more decision authority shifted to politically appointed undersecretaries of the USDA. And, Forest Service Chiefs, though selected from the ranks of Forest Service leaders now routinely change with administrations. Significant, often inconsistent, shifts in policy and focus became more common with changes in administrations. Consistent support from Congress, responding to well-organized constituencies, eroded, and effective new constituencies did not rise to replace those that faded away. Of the factors identified by Clarke and McCool, only scientific expertise remains largely intact. This begs a question. Can Americans afford, or even long tolerate, their national forests being condemned to a future of muddling through?”

Thomas described today’s employees as being as dedicated, hard-working, well-educated, and technically skilled as those that served during the “good old days”. Today
there are many more, often conflicting, laws and regulations coupled with court guidance and various regulatory agencies that routinely overrule actions proposed by the Forest Service. Americans are less connected to natural resources and are willing to satisfy their increasing consumption through imports from “elsewhere”. Thomas describes these places as being less equipped than the United States to scientifically, socially, economically, and technically manage forests and rangelands for sustainability.

“Elsewhere” absorbs the ecological and social consequences of supplying the needs and desires of the United States. In the short run, “elsewhere” profits in the market and with new jobs for its workers. Thomas feels that this should be questioned as “ecologically irrational, morally bankrupt, economically shortsighted, socially irresponsible, and, in the long run, unsustainable.”

In order to cut through the “Gordian knot” of laws, regulations and court decisions, Thomas recommended a new public land law review commission. Thomas feels this would create a vision for America’s forests through clear and open communication as part of political discourse. Recent and past commissions were mentioned by Thomas as having properly identified problems and making recommendations for avoiding the current consequences, but they were never seized upon by anyone in power, “missing a prime opportunity to clear up continuing confusion and turmoil”.

Thomas went on to warn that the National Forests are being portrayed by some as a liability (economic, political, social, and ecological), rather than a national asset that should be increasing in value. He voiced his concern that the long, drawn-out process of adjusting current laws will continue, only adding to the Gordian knot. Not the least of these is the Equal Access to Justice Act, according to Thomas, which allows citizens to
sue federal agencies for non-compliance with law(s) and/or regulation(s). Winning plaintiffs are compensated for costs, while plaintiffs with low net-worth (or non-profit status) have no liability when they lose, no matter the costs resulting from management delays and legal costs to the defendants. Thomas explained that this results in a “payday” when organizations win, and poses no risk if they lose. Thomas believes that the Equal Access to Justice Act allows for “carefully coordinated, strategically-timed challenges that render proposed management actions moot, via time delays and costs that combine to produce unfavorable cost/benefit ratios for management actions”, at times resulting in a decision to abandon the proposed management activity altogether.

Thomas believes that sooner or later, dramatic action to cleave the knot altogether will occur, in order to reduce federal expenditures. He worries that increasing costs will lead to a reversion toward custodial management, with an emphasis on wildfire-prevention and suppression largely focused on the urban interface. He fears that National Forests could be divided up to other agencies with more custodial missions, with the jewels going to the National Park Service and lands more suitable for commodity production going to the Bureau of Land Management or to the states. Thomas adds that National Forests could be sold to the highest bidders; all options that would result in disaster to the public, but would provide short-term revenues toward subduing the nation’s burgeoning debt (Thomas, 2011). Other authors have suggested similar “alternative” management scenarios, including the “marketizing” of non-commodity resources including recreation by funding the Forest Service strictly out of user fees, abolishing the Forest Service and turning the land over to the states, or combining land
management agencies under one “department of natural resources” (O’Toole, 1988, 2007; Sedjo, 2000).

Thomas also expressed concern over recent efforts, led by politicians, to “cut deals by working around laws and established processes” for management of National Forests in Montana and Oregon. Examples of such controversy can be found in the recent legislation proposed by Montana Senator Jon Tester, known as the Forest Jobs and Recreation Act (Tester, 2013) and the Oregon Eastside Forests Restoration, Old Growth Protection, and Jobs Act proposed by Oregon Senator Ron Wyden (Wyden, 2013). On the positive side, Thomas described these as being variously labeled as collaborative, cooperative, coordinated efforts that literally (and metaphorically) have bridged boundaries between multiple public and private landowners. He warned however, that these are compromises that have been worked out by small groups of self-selected participants working out their own deals, and he is further critical that such deals have emerged as proposed legislation. Thomas worries that these proposed legislations do not adequately recognize problems in assuring funding over time or demonstrate the ability to react to changes in economic/environmental conditions that would occur over time.

Several noteworthy “place-based” collaborative efforts are discussed in a paper by Nie (2011), but he too warns against proposed legislations. Nie recommended that Congress and the USFS should oppose forest-specific legislation until a number of more fundamental and systematic concerns are addressed, reflecting the agency issues discussed earlier in this paper. He felt that most important are the questions of how these laws would fit into the preexisting statutory/planning framework and how they would be financed. Chief among these are legislated timber treatment mandates that would set the
stage for future congressional abuse. If enacted into law, these mandates could have the unintended consequence of jeopardizing fragile agreements and negotiations going on elsewhere. Instead, Nie suggested, place-based initiatives and their focus on restoration should embrace a collaborative, competitive, and experimental approach (Nie, 2011). At the conclusion of his editorial piece as well, Thomas promotes adaptive management: “intelligent tinkering…providing for human needs, while conserving for long-term productivity of ecosystems, continuous learning from experimentation and experience, providing for flexibility and an ability to make informed adaptations in management”.

**Towers, Silos and Organizational Psychology**

The potential for a future in adaptive management would require improved coordination and cohesion within the programs of the Forest Service, something that is difficult to achieve as budgets decline. Constrained funding causes the workforce under the various programs to contract into themselves just to cover fixed costs. Less program funding is available to support more collaborative, interdisciplinary projects, especially those most desired at the landscape level. Programs being unfunded or severely under-funded leave fewer resources available for innovative work, partnerships and for covering the salaries of employees who oversee such work. In the case of recreation and trails, less funding is available to cover motorized travel planning and restoration efforts, in order to cover more custodial tasks and facilities maintenance, which is also not being funded at needed levels. The Secretary of Agriculture recently reported that current funding is inadequate to cover the Forest Service’s essential services and general operations (Vilsack, 2013). Making matters worse, high suppression costs and lack of
consistent funding through the FLAME Act, passed in 2009 to create separate funds for firefighting, have forced the Chief of the Forest Service to repeatedly shift funds from other programs to cover fire expenses (Barker, 2013; Tidwell, 2013). The FLAME Act has been cut by Congress each year since 2011, and between 2002 and 2012, $2.8 billion has been transferred from other Forest Service programs (NAFS, 2013).

Brown et al (2010) made it clear in the conclusions of their longitudinal study on Forest Service culture that the significant disruptions that the agency has experienced over the past two decades, including the funding crises, have seriously damaged its learning capacity. Brown et al. defined a learning organization as one that is skilled at “creating, acquiring, and transferring knowledge and at modifying its behavior to reflect new knowledge and insights” (Garvin, 1993). Brown et al. suggested that the significant downsizing, retirements and reorganizations (which are the result of constrained funding and accountability initiatives) have disrupted the agency’s otherwise strong learning capacity; in other words, its ability to “learn how to learn” (Brown et al., 2010).

Organizational learning would be critical to helping the agency to better manage its workload, but also to ensure effective adaptive management of natural resources. An agency made anemic by deficient funding and relentless organizational changes, resulting in the loss of effective operations and low employee satisfaction, cannot be expected to be capable as a strong learning organization (Brown et al, 2010). A preoccupied workforce, like that substantiated by the Forest Service’s ongoing low morale ratings, can tend to take on defensive traits. These traits are counter-productive to the aspirational goals and objectives laid out by Forest Service leadership, including adaptive management collaboration, developing partnerships, and sustainability. As stoic as
Forest Service employees can be, they are part of a human workforce that is subject to organizational dynamics and psychology. Therefore regressive behaviors may emerge that lead to a deepened intractability of organizational problems.

It is one thing to identify organizational problems, but it is another matter to understand and counter their effects. In his book *Sustainability*, author Bryan Norton used the EPA headquarters building in Washington D.C. as a metaphor for the fragmented nature of environmental policy in the United States (Norton, 2005). He told a story about the EPA being moved to a new building in the 1990s, and either by poor design or a poor fit for the agency, likely both, the fragmented layout of the office became symbolic of fragmented functioning of the agency. Norton’s story goes that “eccentric traffic patterns and inaccessible hallways were actually the result of the rapid, but Balkanized, growth of the agency itself”. Additional blocks of space became necessary along with the addition of new departments. Individual towers were built and along with them, disjointed workspaces. Each tower had its own elevators, and the means of connecting the different departments of the agency were a confusing maze. “You can’t get there from here” became the answer to guests attempting to navigate the EPA headquarters (Norton, 2005).

Norton went on to describe other internal problems within the EPA as well; how it seemed to lack a central, unifying vision, coupled with a number of internal barriers, both structural and conceptual, making it difficult to coordinate and communicate between employees and functional divisions. Norton noticed how professionals from different disciplines, although having sincere intentions and an excellent work ethic, were going about their work in isolated, metaphorical “towers”. In the broader sense, Norton
explained, the various disciplines had isolated themselves within their own jargons, processes and techniques, making them inaccessible to other disciplines and the public. Norton stressed that such insolation reinforces “towering”, and that towering reinforces insolation and failures to communicate (Norton, 2005).

Norton suggested that bureaucracies evolve in certain ways, responding to changing policies and missions that cause them to develop new departments, new priorities and new languages or jargons. In so doing, isolated towers are created that often result in poor cross-communications and coordination between functional divisions. In the case of the EPA and its headquarters in Washington D.C., the towers were both metaphorical and literal in the agency’s internal structure, and the physical separations caused by the headquarters’ ad-hoc construction (Norton, 2005).

Norton’s description of towering may be applicable to other bureaucratic evolutions, including that which has occurred in the Forest Service over the past two decades, primarily in the separations between agency operations and programs areas such as environmental analysis, appeals and litigations, and centralized, poorly-integrated business systems including human resources, budget and finance and information and technology (IT) services. These functions often operate in different worlds. While centralization of the agency’s business services greatly improved financial accountability, standardization of information technology and human resources processes, the shift in how these services were delivered has resulted in significant negative repercussions for field-unit employees. Cumulatively, these have negatively affected the ability of Forest Service employees to carry out their mission-critical work (GAO, 2011; Kashdan, 2009).
Similar to the metaphor of towers is the concept of “organizational silos” explored in mainstream psychology literature (Cilliers and Greyvenstein, 2012; Diamond and Allcorn, 2009; Diamond, Stein and Allcorn, 2002; Greenberg and Baron, 2003). Popular literature can also be found on the issue of organizational silos, in the form of business management and organizational leadership books, magazines, web sites and blogs, where contributors lament their frustrations and debate whether silos are good, bad, or necessary to creating healthy competition within a business organization. Examples of such discussions can be found in the web articles of Kotter (2011) and Govindarajan (2011).

Research on organizational behavior explores the silo metaphor as a way of illustrating organizational dysfunction and fragmentation, and understanding how these impact the effectiveness of organizations (Cilliers and Greyvenstein, 2012). Research on silos generally looks at the flow of traditional organization hierarchies. This is where positions of power and influence are layered upon positions of less power and influence; creating the image of silos. Vertical and horizontal silos may also exist between areas of specialization within organizations, which often experience difficulties in communications, coordination and cooperation or become subject to turf battles and empire building. Any form of division that differ in objective, agenda or become competitive for resources and power, can become susceptible to “us vs. them” thinking, known as “silo mentality” (Cilliers and Greyvenstein, 2012).

In the Forest Service for example, silos, though not always labeled as such, exist in the divide between top-down performance measures, management initiatives and global science and the bottom-up knowledge of on-the-ground practitioners (Williams, 2013). Fragmented communications, coordination and increasing departmentalization are
identified barriers between functional programs, based on a study of Forest Service personnel across three National Forests (Davenport et al., 2007). In a report published by Portland State University for the Forest Service (2002), divergent points of view about the agency’s mission (restoration vs. production of commodities) were identified both internally and by the public as being barriers to community-based landscape-level watershed restoration partnerships. This extended beyond individual employee points of view to entire agency programs, driven by funding and accountability targets. These silos were identified as barriers to partnership-based watershed restoration efforts.

Employees are frustrated with these and other agency problems, culminating in poor morale ratings and lack of faith in leadership, resulting in psychological and social effects that should be of concern to managers if conditions are ever to improve.

Organizations are complex environments, in which individual and group psychological dynamics play a major, though often unacknowledged, role in the overall effectiveness of the organization (Allcorn, 1995; Diamond and Allcorn, 1984). These dynamics are known to converge in the workplace, where a variety of relationships occur and workers constantly enlist their coping skills against a variety of anxieties. Organizations, in the way they operate, can encourage workers to cope effectively with anxiety or cause them to have to defend themselves against it. Organizations that nurture self-esteem, participation, empowerment, and effectiveness tend to create a sense of security and confidence for their workers. In such organizations, workers have little need to rely upon their unconscious psychological defenses in order to cope with anxieties. As a result, workers are able to respond deliberately to situations, assume personal responsibility and are more likely to look at change as an opportunity. By contrast, in
organizations that de-skill and alienate workers, employees often feel misled, helpless, suspicious, and anxious when faced with internal and external problems that require change. These employees often see change as a threat, and not an opportunity (Allcorn, 1995; Diamond and Allcorn, 1984).

Although variable and difficult to predict and assess, there are reasons why workplace dynamics occur as they do. People need to create order out of confusion, and how this is accomplished can be explained by psychology. A key concept in this discussion is **splitting**, which is used to describe the fundamental process that people unconsciously use to understand their experiences. This process begins in infancy when experiences are divided into those which are good (create feelings of satisfaction and security) and those which are bad (create feelings of frustration or threat to survival). Throughout a person’s life, experiences and relationships with others are placed into those categories of good and bad. Adults too will often try to resolve conflicts by splitting their perception of people into all good or all bad aspects. If a person relies on the defense of splitting, reality can become rather distorted and behaviors reflective of that distorted perspective. The workplace is filled with anxieties that promote splitting, and this is a known dynamic of the workplace (Diamond, 1997). Additional defensive workplace dynamics are briefly discussed below.

People tend to **introject** desirable characteristics into themselves, such as picking up positive behaviors they see in others. By contrast, in order to defend themselves from emotional conflict, internal or external stressors, people will **project** their own unacceptable or undesirable feelings, impulses or thoughts onto other people or objects. In **projective identification**, the individual remains aware of his or her own affects or
impulses but misattributes them as justifiable reactions to the other person(s). This can be a vicious cycle, because as others react, it often creates the feelings in others that were mistakenly perceived to be there in the first place. Through transference, the individual displaces feelings, thoughts, and behavior onto other persons involved in their interpersonal relationships, largely without being conscious that they are doing so. It is assumed by researchers that people’s internalized worlds are brought to work with them, and these affect their work relationships. These transference dynamics affect people’s perceptions, behaviors and reactions within the workplace, as well as elsewhere, often with long-lasting and perpetuating effects to organizations (Cilliers and Greyvenstein, 2012; Diamond, 1997; Diamond and Allcorn, 2003; Klein, 1948; 1959).

Transference dynamics provide the foundation of psychoanalytic studies of organizations. Transference can occur between employees and executives, executives and employees, and individuals and their organizations. For example, employees may experience feelings of positive or negative transference toward an organization’s executives, depending on how responsive executives are to receiving employee input into direction and decisions. Groups and divisions can also transfer historical experiences onto other groups and divisions that surround them within the organization. Psychoanalysis of workplaces often reveals these psychologically defensive responses to anxiety-ridden aspects of the workplace. Many of the defenses fall into a category of behavioral responses referred to as psychological regression (Cilliers and Greyvenstein, 2012; Diamond and Allcorn, 2003; Klein, 1948; 1959).

Psychological regressive behaviors, such as negativity or hostility, act as an unconscious defense used to combat workplace anxieties. As researchers Diamond and
Allcorn explained it (2003), otherwise mature adults find themselves thinking in primitive categories of good and bad, all or nothing, enemy or ally, which is characteristic of splitting and transference. Triggers for behavioral regression can be many and varied in the workplace. For example, those with power may be perceived as using their authority in arbitrary and confusing ways. Workers may perceive disparities in rewards and penalties, or the in the work setting, pay, or promotional opportunities. Workers with limited freedoms or a sense of powerlessness may engage in defensive, psychologically regressive behavior. Departmental leaders too may slip into regressive behaviors as they compete with each other. These negative relations may cause divisions that are contentious and riddled with conflict, often to the detriment of production and positive organizational identity (Cilliers and Greyvenstein, 2012; Diamond, 1997; Diamond and Allcorn, 2003; Klein, 1948; 1959).

These dynamics can happen among individuals or groups. “Silo mentality”, is when bad characteristics are split off in the minds of one group that is contained within a silo, which perceives itself as good (introjection) and puts the bad onto another group (projection). Research literature refers to negative psychological effects of silos: “feelings of disconnection – the left hand not knowing what the other is doing, stuckness, isolation and powerlessness, lack of trust, respect, collaboration and collegiality” (Greenberg and Baron, 2003; Cilliers and Greyvenstein, 2012). These are the concerns about organizational silos.

Brown et al. (2010) referenced the Forest Service’s extremely low Best places to Work rankings (Partnership for Public Service, 2009, 2011, 2012) and described a “stressed and demoralized” workplace in their longitudinal study of the Forest Service as
an organization. They identified the cumulative struggles of the past two decades as the reasons for the decline in effectiveness and employee morale. These struggles include the shifting management paradigms, reorganizations, downsizing, outsourcing, centralization of administrative/business services and the shift to employee self-service, new budget and target emphases, accountability processes and the ascension of wildfire as a program that consumes over 50% of the agency’s total annual budget (Brown et al., 2010; Davidson, 2009; Dialogos, 2007, 2008; GAO, 2011; Kashdan, 2009; MacCleery, 2008; Paskus, 2009; Partnership for Public Service, 2009). While morale has been generally identified as an area of great concern and emphasis by the Chief (Tidwell, 2010) the psychological effects associated with it have yet to be mentioned or visibly addressed, and therefore appear to be poorly understood, unacknowledged and unappreciated by the agency’s upper managers and leadership.

While it is encouraging that greater diversity in experience and disciplines is being promoted to leadership levels within the Forest Service, it means little if new leaders are unable to disrupt silos, towering, and negative psychological effects in the workforce. Today’s leaders must know how to discontinue or reverse these effects by employing skills and knowledge in effective, integrative team management and collaboration. Otherwise, what are the employees to do? Working for the agency is important to most Forest Service employees and in general, they like what they do for a living (Partnership for Public Service, 2011, 2012). They will continue to perform as best they can within very real constraints, but their work may involve more of only the basics in the future, with less capacity to face complexity, and fewer resources to apply toward innovation, integration and collaboration. By way of example, poor up-front coordination and
isolated perspectives led to the initial approach of the Duck Creek-Swains project, and can be traced to the repeated pattern of the last barrier we explore here: the default approach to recreation management.

**A Persistent “Default Approach”**

At the Seventh Conference of Research on the Colorado Plateau in 2003, Dale Blahna and Doug Reiter described what they felt had long been the “default approach” for land managers, illustrating the sequence involved: managers tend to allow or encourage use to an area; at some point the use and subsequent impacts become unacceptable; managers decide that they need to identify a capacity and to restrict use in that area, with little attention to the consequent result of dispersing the use to other areas. Referring to Cole’s generalized impact curve (see Figure 8), Blahna and Reiter explained that managers should realize that placing use restrictions in high-use areas can have the effect of displacing use and impacts elsewhere. This effect is not just something to think about in the abstract, but must seriously be considered. This is important because, by extension, such displacement reduces opportunities for solitude in previously lesser-used areas and homogenizes recreation opportunities over broad landscapes. These are irreversible effects not often considered in detail in cumulative effects analysis, moving the condition of the land away from the Forest Service’s goal of sustainability, instead of toward it.

There are several reasons why the default approach is wrong-headed for recreation management. One reason is that visitor perceptions often do not match the concerns of managers, which, depending on the severity of the impacts, calls into question the need for action in the first place. For example, most recreation experiences are not solitude
dependent, especially to visitors who choose high-use areas (Blahna and Reiter, 2003).

This concept is related to an idea known as shifting baseline syndrome. A term first used by a fisheries biologist named Daniel Pauly, the shifting baseline is the idea that new visitors to an area tend to be unaware of how it used to be. Humans or nature have transformed the environment, in fact, a long succession of many changes has occurred over time, but the people of present do not perceive those changes. Changes that occur during their own lifetimes are often perceived as a loss, but those that happened before are largely unknown and not perceived, or felt as deeply, as a loss. People and societies tend to adjust the baseline to the new level, which becomes the new standard for conservation and even sustainability (Pauly, 1995; Rosenzweig, 2003).

Another related concept is the last settler syndrome, which describes the tendency of each new settler to want an environment to remain as it was upon their arrival. The expectations and preferences of the newcomers often differ from those of long-term residents, and as a result, conflicts arise (Groothuis, 2010). Using the example of crowding, long-time visitors to an area may remember a time when they could recreate with fewer encounters and had greater opportunities for solitude. New users coming to the area would have no pre-established norms or expectations about the level of encounters, and will likely base their future expectations on the level of encounters they experienced on their first visit. At the same time, long-time users may be feeling less satisfaction with their experience based on increased encounters with the new users. In areas where a large proportion of visitors are there for the first time, studies may show high levels of satisfaction, whether use levels are high or low. Therefore, norms would be expected to change with the most recent settlers (Nielsen et al., 1997).
At the 2003 conference in Colorado, Blahna and Reiter presented three case studies that illustrated differences between managers’ and visitors’ perceptions, and demonstrating the greater effectiveness of other management actions, rather than restricting use. These were the Pecos Wilderness Area on the Santa Fe National Forest, the Moab Slickrock Trail and Sandflats area in southeastern Utah, and the BLM Whitewater Rivers Study, also in Utah. In general, findings were that most visitors felt that current use levels and impacts were acceptable. Continuing to allow recreational use were found to be most important to the visitors and increased management was preferred over restrictions in high-use areas, so long as providing services and resource protection were the focus of the increased management.

In the river study, Blahna and Reiter generally found it preferable to limit use on lesser-used rivers in order to maintain opportunities for solitude, but on rivers where users are already expecting to have several encounters because use is high, there is little benefit in restricting use and risking displacement of users to lesser-used rivers or stretches (Blahna and Reiter, 2001). In the Moab example, the BLM was successful in working closely with citizen partners to develop a plan for maintaining the area, even instituting a modest fee to allow continued access and to generate revenue for the ongoing care and management of the area. For the Pecos Wilderness, recommendations were to continue the existing use patterns, allowing use to actually increase in the high-use zone. By discouraging use, or at least not encouraging it in the lesser-used areas, impacts and user density could remain low. Visitor information and education would be the primary tools in reducing impacts and conflicts in high-use areas (Blahna and Reiter, 2003).
Similar to the effects of the *shifting baseline* and the *last settler* syndromes, Blahna and Reiter concluded that although impacts may appear to be high to managers, they likely are not so to visitors. Managers’ tendency to see impacts and high use as unacceptable and determine that such areas should be restored to a more “natural” state may result in visitor dispersal, and by extension, an increase in overall regional impacts. Visitor satisfaction would likely decrease with encroachment of new visitors into these previously lesser-used areas, especially if the previous visitors had gone there to obtain some degree of solitude. Visitors remaining in the high-use areas are likely to become angry as they become subject to restrictions, because they do not perceive the same need for action as managers. This results in conflict and a decline in agency image, and consequently, lost opportunities to collaborate and develop a shared sense of ownership with partners. This includes the opportunity to work cooperatively on implementing fees that could have been used toward the maintenance, protection and enjoyment of an area (Blahna and Reiter, 2003).

Blahna and Reiter expressed concerns that wildland managers rely too much on social carrying capacity and setting use restrictions, likely because they assume that increasing visitation means decreasing recreational quality or increasing impacts (2001). From a regional perspective, there are secondary effects of displacement that could potentially result in a reduction in the diversity of available recreation opportunities (Borrie et al., 1998; Stankey, 1974). Setting use limits in high-use areas may result in displacement of users, thereby reducing the availability of solitude experiences offered within a region. Blahna and Reiter stated that as a rule, planners should not expand or encourage use of lightly used areas (e.g., advertise or build new roads, trails, or facilities) or limit use in an
area without evidence that: 1) experiences are density-dependent; 2) use of indirect visitor management methods have been attempted and found to be ineffective; and 3) use dispersal will not create more off-site impacts (social, ecological, and managerial) than are already occurring (Blahna and Reiter, 2001).

David Cole described similar concerns for wilderness areas, specifying increasing use density, along with a potential for conflict due to increasing diversity of users, and an increase in ecological impacts (Cole, 1997). Cole’s concern was that, in light of limited resources (ie: budgets, personnel), more attention should be given to places in wilderness that are most vulnerable to degradation, which includes loss of solitude. Blahna and Reiter also stated that correcting existing impacts often requires major reductions of, or even eliminating use, which is not a reasonable expectation once an area becomes high-use (2001). Cole continued that, when management resources are scarce, they should be allocated to the places that are most precious, the ones most likely to degrade further, and most likely to respond positively to good management. Following the illustration of the impact curve (Figure 8), recreation sites that have been heavily-used for a time are not likely to experience further deterioration. In contrast, places that have been only lightly used are highly vulnerable to deterioration. Even slight increases in these places can result in substantial increases in impact (Cole and Hall, 1992; Marion and Cole, 1996).

Cole observed that many visitors do not notice ecological change; of those who do, many do not conceive of the change as “damage” or undesirable change (1990). Most visitors do not change their behavior or have less satisfactory experiences even when confronted by impacts they consider undesirable. For example, even those who dislike the heavy evidence of horse use are likely to continue to camp in the same places and
travel the same trails and, on the whole, tend to enjoy it. Hall and Cole (2007) also suggested that most visitors were pleased with their wilderness experience, making behavioral adjustments (coping) in order to deal with potential conflicts or perceptions of impact. Hall and Cole concluded that reductions in use would have little effect on visitors’ perceived quality of experience and that few visitors would support use limits.

Sometimes visitors do notice change, however. In her research on conflict and coping, Schneider suggests that when visitors employ coping mechanisms in response to changes in resource conditions, crowding or conflict and managerial actions, some form of displacement tends to occur (2007). Hall and Cole (2000) describe two types of displacement. The first is that which occurs because an area is crowded, heavily used or impacted, and the second is that which displaces visitors who care more about freedom and lack of regulation than about solitude. Hall and Cole found that implementation of certain visitor regulations caused more people to be displaced than the crowded conditions the regulations were designed to correct (Hall and Cole, 2000).

In contrast to visitors, managers tend to perceive more site impacts and are more strongly compelled to do something about them (Cole, 1990). Compared to recreationists, resource managers tend to be more sensitive to problems and often have more traditional, natural environment oriented expectations of the recreation experience. While managers tend to be good predictors of visitor demographics, they tend to be poor predictors of visitor motivations or satisfaction (Anderson and Blahna, 1996). Spending time and political capital trying to set use limits or visitor capacities may distract managers from applying more effective management tools like site design and hardening, visitor education, and others. Again, when viewed in a regional context, setting use
limits would only make sense being implemented in low-use, relatively pristine areas (Blahna, 2007; Blahna and Reiter, 2001; Borrie et al., 1998; McCool and Cole, 2001).

With this risk of unintended consequences, why do managers and analysts so often opt toward the default approach, toward restricting use in high use areas? Referencing McCool (2001), Blahna explained that this approach has been seductive; it seems so obvious that it becomes the default. If human uses are damaging the land, it seems obvious that managers should remove or reduce the use. Because the potential for counterintuitive effects is not very apparent, they may be unanticipated without analysis that considers explicit objectives and regional effects (Blahna, 2007).

The emphasis on numbers of visitors also reflects a biocentric bias within the agency, as well. This bias was discussed in detail in the section of this paper on carrying capacity research, and has influences the management tendencies of the Forest Service. Typically, according to Blahna, high-use areas are often perceived as “problems” rather than “opportunities” to provide preferred experiences, constrain impacts, and protect surrounding landscapes from shifting use. Blahna therefore expressed concern that the agency would continue its tendency to focus on proximate issues such as numbers of roads and OHV users, while ignoring the ultimate causes of the problem: a lack of recreation objectives and the necessary staff, funding, and decision impact to meet the objectives (Blahna, 2007).

Because the many agency barriers described in earlier sections reduce overall functionality and capacity of the agency, they further compel agency managers toward to falling back to the “default approach”. Of the destabilizing issues affecting the capability of the Forest Service, the biggest concern is the inadequate field budget, a problem that
has plagued the recreation program for decades, and become worse in recent years (Blahna, 2007; Cerveny and Ryan, 2008; Meier, 2007). Chronically understaffed, managers struggle to put together field crews and accomplish work with inadequate budgets, augmented with “soft” funding through a variety of special state and federal grants and special federal projects. They must handle the “burden shift” of complicated, administrative accounting and paperwork, as well as conducting and writing environmental analyses, reporting work accomplishments, overseeing the maintenance of recreation facilities and trails, as well as new and reconstruction projects, and providing customer service through personal contacts on the ground and written information. All of this must be done while putting out fires, both figurative and literal in nature.

National Forests have authority to charge fees for use of certain developed recreation sites. Under the Federal Lands Recreation Enhancement Act of 2004, the Forest Service may charge modest fees for developed recreation, with most of the revenue staying at the local level to be reinvested in the recreation sites (USDA, 2013a). In other cases where a fee is charged, services are provided by “concessionaires”, which are private companies that run recreation facilities for the Forest Service, under a special use permit. Although there is public support for fees and concessions, these have also been the subject of tremendous controversy (Blevins, 2013). Some people view these as double-charging on top of taxes already paid. Others are concerned about commercializing the National Forests and losing affordable recreation opportunities for the public. Most controversial are efforts to require fees for the use of general forest areas and high impact recreation areas (HIRAs). Some of these include a general access “Adventure Pass” that would require visitors to purchase the pass before parking and using general areas of a National
Forest. This interpretation of FLREA by the Forest Service was successfully challenged in court in 2012. Elected officials have also become concerned and have sometimes interceded in the fee and concessionaire process, making legislative reauthorization of FLREA somewhat tenuous (Blevins, 2013; No Fee Coalition, 2013).

There are tremendous differences in the types and amount of recreation occurring on the forests across the nation, and this affects the distribution of appropriated funding. Across the nation, most recreational uses on National Forests are free and do not involve the use of fee sites (USDI and USDA, 2012). There is also variation in the amount of developed recreation occurring in parts of the country. While some National Forests manage a high amount of developed recreation use and generate enough revenue to become financially sustainable, other forests have greater emphasis on activities such as hiking, horse riding, hunting, fishing, climbing, backcountry skiing, OHV use, and undeveloped or low-development camping (USDA, 2013b). Unlike their more highly-developed counterparts, these National Forests have less opportunity for generating revenue. Forests with relatively low levels of developed use often receive less appropriated budget, as well. However, these National Forests are still responsible for mitigating the effects of recreation use to the environment, providing visitor services, and maintaining a number of valuable facilities, all of which bear substantial cost.

Nationally, approximately 6,300 recreation sites require a fee for use, while 14,500 are free (USDI and USDA, 2012).

While collaborative organizations are rapidly emerging to address forest health and management concerns, at the time of this writing there is a lack of local partners capable of and interested in providing financial support toward recreation, although a number of
partners exist that can provide tremendous amounts of labor, and some grant opportunities (USDA, 2013c). Often, a pairing of agency funds, or “match”, is required. This can be difficult to achieve if budgets are inadequate or barely enough to cover fixed costs. Neither agency funds nor labor is always available to support that scenario.

Government is becoming less able to support public services without revenue. Appropriated budgets are insufficient to cover fixed costs (such as permanent personnel, fleet, phones, utilities and office rent), off-the-top costs of administrative support, NEPA (environmental analyses for recreation projects and travel planning, including appeals and litigation), and funding transferred to fire suppression. At the time of this writing, deep budget cuts are occurring due to the federal deficit and across-the-board limits on federal discretionary spending, known as “sequestration” (Abbott, 2013; Congressional Budget Office, 2013). On many National Forests, little or no appropriated funding remains to cover routine and deferred maintenance activities on the ground, even when coupled with recreation fee revenue. When combined with conflicting priorities, competing programs, inflating operating costs, and difficult hiring processes, the agency’s recreation programs are truly struggling. This unintentionally compels the Forest Service to take on more work with less capacity in order to add funding to cover fixed costs, with the result of overtaxing employees.

As retirements are encouraged to reduce the size of the workforce, and employees relocate into new positions, expenses are incurred to cover retirement benefits. Depending on the incentive, some retirements are not allowed to be refilled. For those that are, covering moving costs to fill vacancies becomes an issue. This sometimes compels local offices to shuffle existing employees into vacant positions, often resulting
in non-recreation employees that have been displaced from other reduced staff areas being given responsibilities over recreation. While these employees are capable of handling certain tasks, these employees are often less comfortable with interacting with the public and lack competency and experience in the social sciences, and may occupy recreation positions for many years. They may also lack interest and passion for the comprehensive work of recreation, and are less likely to participate in quality analysis and in collaboration and networking opportunities (Meier, 2007).

Ultimately, the agency’s capacity to manage recreation is greatly affected by these circumstances; further delaying strides toward sustainable recreation and encouraging a tendency to fall back into old patterns, perpetuating the “default approach” illustrated by projects such as the initial stages of the Duck Creek-Swains project on the Dixie. The next chapter brings our discussion to conclusion by looking at ways the Forest Service can build its collaborative capacity and knowledge toward a more sustainable future in recreation management. When managers are familiar and comfortable with collaborative processes, they are better able to understand what is happening in a given situation, and therefore are better able to choose the right tools for dealing with issues. To illustrate, we return to the Dixie travel management case study to see how that particular forest moved away from the “default approach” by gaining and understanding of the value of collaboration, and adopting a management approaches that were more socially, economically, and ecologically sustainable.
CHAPTER 5: OVERCOMING THE DEFAULT APPROACH

Know-How and Choosing the Right Tool

“Tacit knowledge”, a term coined by Michael Polanyi in 1958, is knowledge that is difficult to communicate because it is context-specific and rooted in one’s personal and professional experiences, ideas, values, and emotions (Gourlay, 2002). Tacit knowledge often resides in relationships and learning-by-doing (Nonaka and Takeuchi, 1995; Von Krogh and Roos, 1996). It is usually referred to as a property of individuals, but can also be applied to groups (Baumard, 1999). An individual’s tacit knowledge is difficult to verbalize because it is expressed through action-based skills, learned through experiencing and doing. It is often passed down through apprenticeships and through “rich modes of discourse that include the use of analogies, metaphors, or models, and through the communal sharing of stories” (Choo, 1998; Von Krogh and Roos, 1996).

This is in contrast to “explicit” knowledge, which can be articulated, codified and stored for reference and instruction. The following lists several adjectives that can help describe tacit knowledge: vague but relevant; regionally valid; context bound; personal; morally mature; anchored to emotions; humanistic; sensitive understanding of tradition’s voice; mediated by traditions; mediated by examples; unclear; trust in the constant; and locally anchored. The following list is in contrast to tacit knowledge: logical and irrelevant; universally valid; impersonal, irresponsible; anchored to rationality; technocratic; socially engineered; mediated by textbooks; mediated by rules; clear; characterized by critical openness; oriented toward cosmopolitanism (Toom, 2011; Rolf, 1991).
Tacit knowledge is similar to “skill”. Polanyi referred to it as “knowing as an art, as a skill of the knower” (1958). These skills are learned through a trial and error, imitation, and modeled behavior. Tacit knowledge is an important part of everyday life, in sports, in the trades of craftspeople, in the arts, and how professionals do their jobs. It may be a sequence of actions that have become so routine, through practice and experience over time, that they are done almost automatically. Tacit knowledge is therefore a competence, often referred to as “know-how”; the things that an experienced practitioner can offer to another when they say “let me show you how to do this” (Eraut, 2001; Polanyi, 1958; Rolf, 1991; Smith, 2003; Toom, 2011).

An individual’s tacit knowledge is amplified and crystalized as one experiences deeper understanding of the knowledge they receive and the potential that the knowledge holds (Nonaka, 1991; Stillwell, 2008). It is believed that problems are originally known tacitly by an individual or individuals, and that those problems can be resolved or prevented organizationally by taking them through a four-stage process. The transfer of an individual’s tacit knowledge occurs first through the stage of socialization, where knowledgeable members of a group impart their experiences dealing with a similar problem. Through metaphor and analogies, the group goes through a second stage of externalization, where tacit knowledge is made into explicit knowledge, comprehensible to others. A third stage, combination, occurs when the newly explicit knowledge becomes widely disseminated, discussed, redesigned and modified. The entire team is involved in the exchange of ideas. The fourth stage, internalization, occurs when the project is implemented and people begin to live with the outcome. Internalization
converts the changed, explicit knowledge again to a tacit form, this time held by many people. A successful process involves all stakeholders (Nonaka, 1991; Stillwell, 2008).

The Forest Service, as a somewhat older institution, has accumulated a great deal of tacit knowledge within its workforce, and has benefitted greatly from this over the years. The agency has kept many traditions and traditional knowledge, and utilized that knowledge in the development of innovations. At times however, the agency bypasses opportunities to develop and expand its tacit knowledge because agency leaders are unable to understand, appreciate or access the tacit knowledge within the workforce. This is a serious problem caused by top-down, authoritative functioning, when reconnaissance and advice from lower levels of the organization is missing, or communications and coordination across programs areas is deficient. This often occurs when the workforce is required or encouraged to work in an the towers or silos discussed earlier, or in a multi-disciplinary rather than interdisciplinary fashion (D'Amour et al. 2005; Freeman et al, 2011; Garcia 1989; Innes 2005; Ray 1998). This can also happen when employees’ time becomes limited or conflicted with other priorities, or when the budgetary expense and potential for lost time in bringing people together is of concern (Freeman et al., 2011; Stern and Mortimer, 2009).

The Forest Service is attempting to do more with its explicit knowledge, such as making use of the internet for accessing regulation, manual and handbook direction, standards, specifications, research and on-line “e-training”. These often cover mandatory trainings on topics such as computer security, human resources issues and civil rights. Lessons-learned reports and after action reviews (AARs), circulated through the internet and email, are especially utilized in the fire and safety arena, but also in dealing with
some NEPA issues. Improvements in utilizing web-media are also facilitating some expansion in the agency’s tacit knowledge. For example, the agency’s technology and development centers produce a library of digital instructional materials on tool and equipment use, presented by some of the most knowledgeable practitioners and craftspeople in the field (USDA, 2013c). This does not, however, replace the value of spending time in the field observing and interacting with that level of knowledge.

Another developing media, webinars and video teleconferencing, allow for greater numbers of participants for training and meetings (Bardon and Moore, 2007), but they are unable to facilitate much in the way of informal dialog, because of time lags and a one-at-a-time process that must be utilized for fielding questions to avoid participants walking over each other.

Unfortunately, travel caps, reduced budgets and harried schedules have greatly limited the availability and attendance at hands-on training sessions, professional conferences, and perhaps most importantly, opportunities for newer employees to shadow those with senior experience. This affects knowledge transfer in everything from traditional skills/ tool use, to administrative procedures, to NEPA. There is concern at the time of this writing that newer employees are not being provided with or encouraged to utilize opportunities for mentored learning. Without bringing people together, mentoring and modeling behavior, newer employees may not realize the tacit knowledge existing in more experienced workers (Meier, 2007). Tacit knowledge may remain untapped more as budgets tighten; experienced field crew leaders may not return in coming seasons, permanent employees may be forced to relocate, and retirements will occur.
There are a number of youth mentoring programs in the agency, primarily designed to interest young people, particularly urban and underserved youth, in the outdoors and to consider careers in natural resources management (USDA 2013d, 2013e). There are also citizen mentoring programs, aimed at promoting environmental literacy, developing partnerships and making community connections (USDA, 2013f). Additionally, there are student hiring programs to bring on students from a number of academic fields, from the undergraduate to doctorate levels (USDA, 2013g). Internally, the agency offers leadership programs, such as the Middle Leader Program offered in conjunction with the University of Montana (University of Montana, 2013) and the leadership trainings held at Grey Towers a conservation education and leadership center located at the family home of Gifford Pinchot (USDA, 2013h). Tremendous opportunities are offered at the student, leadership and policy levels, but less so at the technical and professional field levels.

There are important areas that could benefit from an expansion of tacit knowledge at all levels, especially the field level. These include integrated team management and stakeholder collaboration. Many Forest Service line officers and managers are skilled in their own disciplines, but lack familiarity with integrated team management and stakeholder collaboration, and the many forms these can take. Still viewed as buzzwords by many in the agency, many managers do not seek opportunities to employ these methods, and even managers that understand their value struggle to hone their experience with them. There is inadequate understanding, discussion, mentorship or training, which are needed to build experience in these arenas. Opportunities for training and gaining experience with teambuilding and collaborative/partnering approaches are not widely available or advertised within the agency. They are in the process of developing
however, and are becoming available via the agency’s Partnership Resource Center and Collaborative Forest Landscape Restoration Program websites (USDA, 2013i; USDA, 2013j).

In her recent exploration of Forest Service leadership, Cindy C. Chojnacky, a retired agency employee who held a number of positions in public affairs, policy, and leadership, found that much had changed since Kaufman’s classic *The Forest Ranger* was written in 1960. However, her study concluded that the Forest Service still held strong bureaucratic tendencies (2012):

1) “Rules-driven management” designed from early 20th century ideas about scientific management, a legal-rational authority to carry out certain tasks, with legitimacy resting on rules, and obedience to an impersonal order, rather than an individual.

2) “Bounded rationality” through “unobtrusive control”, a premise for decisions that are controlled through division of labor, systems of hierarchical authority, communication channels, training, and indoctrination.

3) “Institutional theory”, which instills values, creates reality, and reinforces structure through beliefs and normative systems. This is how bureaucracies relate “the way we do things” with doing “the right thing”.

4) “Position power”, which is how those in authority can subtly articulate old hierarchical power relationships and formal bureaucratic practices, even when structural change is attempting to encourage opposite behavior. Attitudes and behavior that resonate with the prevailing social order are those that are
considered legitimate. Those in positions of power rationalize what is called
legitimate, and subordinates accept their version as rational.

Chojnacky described a duality in the agency that continues to emphasize line officer’s
careers and compliance with agency norms, which most often rewards agency loyalty and
least rewards innovation and independence (Kennedy et al. 2005); values seemingly at
odds with core leadership criteria such as “leading change and leading people” currently
emphasized by the Office of Personnel (OPM, 2012). Chojnacky explained that her
perspective was not meant to discredit the land or work ethic of the Forest Service, but to
point out that leaders socialized toward compliance may not always respond creatively to
new challenges or refine their mission with new knowledge and social change. Her
concern was that the agency may just keep adding new divisions, staffs, processes, and
teams in reaction to lawsuits, political and other pressures, ultimately increasing
complexity, fragmentation, and employee and public frustration. Although a great deal
of change had occurred within the agency over the past 30 years, Chojnacky concluded
that the Forest Service needed to do more toward making organizational changes that
would better accommodate a diversity of employee roles to address the complex land
stewardship challenges of the 21st century.

Cole and Yung (2010) also warned that the issues of the twenty-first century will be
even more nuanced, with solutions that are less clear-cut, less black and white. It will
therefore become even more critical for stakeholders to be brought into agency processes,
so that opportunities are not lost for collaborative, social learning, which is necessary for
dealing with the complex, wicked problems faced by the agency today (Daniels and
Walker, 2001). Collaboration, social learning, and by extension, partnerships, are the
new management approaches that will bring the agency to a more sustainable future and lead managers away from the “default approach”. However, managers who engage in collaboration must develop the knowledge and skills necessary to become confident practitioners, so collaboration cannot only be the domain of academia, policy and leadership. There are sound principles that are the foundation the craft, as well as an array of specialized tools that can be used, and proper processes by which certain techniques and methods should be applied. There are certain attitudes and expectations that the practitioner ought to have in order to enter into a collaborative process.

Collaboration is both an art and science, and with skills that need to be taught and mentored, practiced and honed. These should be apprenticed early in agency careers.

In order to choose the right tool for a job, one requires knowledge and understanding of what the tool can do. While the agency is gaining in its experience in collaborative processes, a widespread tacit knowledge of collaboration doesn’t yet exist, and little exists to develop and expand it as a core competency, especially at the field level. In order to curb the tendency toward the “default approach” and move toward a future sustainability, as well as meet the expectations of a changing workforce, it will be critical to for the agency to develop, emphasize and utilize tacit knowledge of collaboration within the organization.

**Building a Professional Community of Practice**

Constrained budgets, travel “caps”, and reduced staffing result in fewer opportunities to “sharpen the axe” by meeting with peers, discussing projects, exchanging knowledge, including research and development (Meier, 2007). The “default approach” occurs in the
absence of time and support for good communication, and thoughtful planning with stakeholders. Agency managers want better than this.

This desire was made clear at the National Workshop on Recreation Research and Management held in Portland, Oregon 2005, particularly during the close-out sessions that were held with the managers and researchers gathered from around the country. The purpose of these sessions was to discuss problems and suggest remedies, which were summarized in the proceedings for the workshop (USDA, 2007). Too much to do and inadequate access to needed information were identified by the managers as their primary problems (Meier, 2007). Identifying a problem with communicating national goals and strategies to the ground, many managers attending the workshop expressed that a “disconnect” lies between agency programs and the systems and people needed to implement them. If systems were made more accessible and applicable to the field they would be better-used by managers. Both the managers and researchers determined that a concept known “community of practice” offered a solution to this problem.

A “community of practice”, a term introduced by Etienne Wenger, renowned expert on the topic, is a collection of “groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly (Wenger, 2005). The community must have a shared domain, where members value their collective competence and learn from each other. The members engage in joint activities and discussions, assist each other and share information. Learning occurs through these relationships. Members are practitioners, sharing their resources with their community. These resources may include experiences, stories, case studies, tools and methods for
addressing recurring problems. The goal of any community of practice is self-improvement (Wenger, 2005).

The 2005 workshop participants felt that the discipline of outdoor recreation management would benefit from a community of practice, and that it should include several disciplines that are directly or indirectly involved with each other. The close-out session identified a number of related professionals that would link with outdoor recreation managers, including but not limited to: social science researchers, cultural heritage specialists, landscape architects, engineers, and law enforcement officers (Meier, 2007). Five objectives for a recreation management community were identified:

1) Improve knowledge management (via an internet portal), where community members, at any location, could access information useful in mentoring new employees and improving the knowledge base for existing professionals.

2) Streamline communications/ technology transfer. Managers need one-stop shopping for accessing research and abstracts for practical applications. The community of practice website would also include links to discussion forums, academic journals, professional white papers, case studies, student theses, agency news and program links.

3) Develop professional skills/ provide for ongoing education. The community of practice website would include information on available training opportunities, pertinent to a variety of aspects of recreation management, including academic courses in social psychology, design, NEPA, related job trainings and workshops and professional gatherings such as symposiums. Information on professional societies and mentoring programs would also be well advertised on this website.
4) Assist with hiring/ outsourcing/ contracting. Managers discussed their concern over the aging workforce, hiring freezes, decreasing budgets and increasing responsibilities. Given these circumstances, existing employees must be prepared to diversify and fill certain gaps that may occur, one of which is expected to be contracting capability. A community of practice can help provide the knowledge and resources to administer contracts, where needed and appropriate, to shore-up for gaps in the workforce.

5) Bridge recreation research, development and management. Managers identified several areas of research and development that should be bridged with management practices. The community of practice would be a good location for posting researcher’s past and current work, and a directory for making contacts between managers and researchers. A concern was voiced that well-funded programs such as wildfire and fuels reduction often dictate research topics. Improved communication between recreation managers and researchers may move the focus of research toward topics of importance to recreation managers, and opportunities to be published in academic journals dealing with recreation.

*Inspiration* was identified as a critical need, in order to help recreation managers with the many challenges they face on the job. A community of practice would foster a collective effort of ingenuity and pooled skills toward solving common problems. The community of practice would be based on the reciprocity of mutual benefits and an obligation of service to fellow professionals, the agency, and the public (Meier, 2007). A community of practice could help expand constituency for recreation research as well,
resulting in further support and growth in capacity over the long-term. It was felt that this would help reverse an apparent lack of interest in recreation research at the agency leadership level, a frustrating obstacle given that recreation uses and impacts were growing (USDA, 2007).

In the years since the National Workshop on Recreation Research and Management was held, many advancements have been made in the area of social networking. A website called Reclink has been developed for networking professionals in the field of recreation, and is on its way to being developed into the community of practice envisioned at the Workshop. Only a few years old, Reclink has roughly 1000 members and already is well underway to accomplishing many of the objectives described above. At the time of this writing, Reclink has 35 groups of practitioners, including Recreation Special Uses, Volunteers, Safety, Heritage, Landscape Architecture, Trails Planning, Accessibility, Collaborative Processes, Sustainable Recreation and Tourism, to name a few. Reclink also features a searchable library for members to link online resources, a blog, a forum for topic-specific discussions, and announcements of upcoming events and job advertisements. Reclink is expected to grow in the coming years as membership expands. Current membership now includes multiple agencies and is spreading among private-sector professionals, further contributing to the knowledge-base.

Another development, the Framework for Sustainable Recreation (USDA, 2010b) and Implementation Guide (USDA, 2012-Draft), discussed earlier in this paper, respond to USDA Secretary Tom Vilsack’s call for an “all lands” approach to forest management, emphasizing a collaborative approach to forest and community sustainability. It promotes a “systems approach” that looks at the sustainability of the whole system,
examining the linkages and interactions between the elements that compose the entire system (USDA, 2012-Draft).

The Framework utilizes the definition of sustainable recreation from the 2012 Final Planning Rule (USDA, 2012h) as being “the set of recreation settings and opportunities on the National Forest System that is ecologically, economically and socially sustainable for present and future generations”. This definition recognizes the role that recreation plays in supporting the overall Forest Service mission of sustainability, and the necessary integration recreation must have with other agency programs. Recreation is identified as the portal through which people connect to their National Forests. The Implementation Guide to the Framework for Sustainable Recreation provides tools and resources for accomplishing day-to-day work. The Implementation Guide identifies Reclink as the sustainable recreation community of practice. Together, the two are provided for practitioners to find practical tools, suggestions and lessons learned for managing for sustainable recreation (USDA, 2012-Draft).

The Framework for Sustainable Recreation is intended to work under six guiding principles that build upon the idea that sustainability exists when there is an intersection of environmental integrity, social benefits and economic vitality: 1) connecting people with their natural and cultural heritage, 2) promoting healthy lifestyles, 3) balancing societal, economic and environmental needs, 4) cultivating community engagement, 5) managing National Forests and Grasslands as part of a larger landscape, 6) integrating recreation more deeply into the Forest Service mission.

The Framework identifies ten focus areas that give recreation a role and niche in creating forest and community sustainability: 1) restore and adapt settings, 2) implement
green operations, 3) enhance communities, 4) invest in special places, 5) forge strategic partnerships, 6) promote citizen stewardship, 7) know our visitors, community stakeholders, and other recreation providers, 8) provide the right information, 9) develop a sustainable financial foundation, 10) develop the agency workforce. These place recreation management in the Forest Service on the cusp of great possibility. However, the program is in great danger of set-backs and stagnation due to the many challenges discussed in the preceding chapter.

**Authentic Public Participation: The Case of the Dixie**

Most National Forests have experienced many of the struggles discussed in the previous chapter. The Dixie National Forest was no different. Through its work toward a revised Forest Land and Resource Management Plan (Forest Plan) however, the Dixie found an opportunity to try a new approach, allowing it to better adapt its planning to local needs and break out of the “default approach”. By the early 2000s, the Dixie was embarking on its Forest Plan revision process, and collaboration was built into its early public participation efforts. State and local governments, other federal agencies, interest groups and the general public were brought in through open-houses to identify issues critical to the planning process, and multi-stakeholder focus groups were subsequently formed to work on those issues, recruited and facilitated by neutral third parties. By the time forest-wide travel planning was begun in 2004, the Dixie had gained a great deal of experience with collaborative processes, and this had cultivated a comfort level with agency leaders and line officers. The Dixie was on its way to building tacit knowledge about collaboration. The forest had already learned a great deal from the Duck Creek-
Swains and other projects, as described in Chapter 1, and utilized that experience in its forest planning and forest-wide travel planning.

When the Duck Creek-Swains project began, conflict between local and federal governments, access and environmental organizations, still hung thick in the air over the 1996 designation of the nearby Grand Staircase-Escalante National Monument (Carter, 2004; Thomas, 2006). The Monument was established by presidential proclamation as a means of protecting geological, historical, and scientific attributes of the area, largely in response to a proposal for extensive coal mining that would occur in the area (Larmer, 1996; Thomas, 2006). According to one involved county commissioner, despite a public involvement process designed to involve several user groups and the addition of five outside professionals to the BLM’s planning team (nominated by the State of Utah), the planning process for the Monument did not focus on motorized travel. Because of this, the county commissioner explained, management of motorized travel was not properly considered, there was a lack of a comprehensive road inventory, and little attention was paid to creating recreational opportunities for OHV users (Thomas, 2006).

A long battle ensued over whether many of the roads were under the county’s BLM’s jurisdiction, or that of the local counties. R.S. 2477, a rule from the 1866 Lode Mining Act which granted settlers rights of way across federal land, was the instrument used to contest the right of the BLM to close roads and trails within the Monument. Originally intended to encourage the development and mineral exploration of the West, R.S. 2477 was brought back to life by the modern “Sagebrush Rebellion” as a tool for battling federal government actions to close roads. Two of the most famous examples came in the late 1990s with the Forest Service closure of the Jarbidge Road in Elko County,

Upon its decision to close approximately half of the nearly 1,200 miles of road in the Monument, the decision was appealed. A Kane county commissioner and the sheriff then risked federal prosecution when they removed 31 BLM road and trail closure signs, and the county proceeded to claim rights to over 60 of the roads within the Monument. When the county began installing its own signs inside the Monument, the Wilderness Society and Southern Utah Wilderness Alliance (SUWA) intervened with a lawsuit against the county, and which in turn responded with a lawsuit against the BLM. Over the years there were several rulings concerning the Monument. In 2009, the 10th Circuit Court of Appeals ruled that Kane County had not proved any valid road rights and that its actions had violated the supremacy clause of the U.S. Constitution, which says that federal law trumps any conflicting state, county or local law. The same year, court ruled that the Wilderness Society and SUWA had no standing to file their lawsuit. In 2010, the Obama administration ceded 75 miles of roads within the monument over to Kane County, considered to be the first victory by any Utah county involved in RS 2477 battles (Zaffos, 2011)

Actions taken by the BLM to restrict motorized access and reduce grazing on the Staircase were still being heavily contested during life of the Duck Creek-Swains project, making any similarly-perceived action by another federal agency, in this case the Forest Service, difficult at best. Forest Service managers, well-meaning in their intention to help restore an impacted landscape by limiting public motorized access, learned quickly that their proposed actions would not stand amid local sensitivity over previous restrictive
actions on public lands. Additionally, perceptions that the analysis was not site-specific enough to make a reasonable decision, as well as perceptions that the agency had already made up its mind, had stakeholders from both the motorized and environmental communities very upset and prepared to appeal the project (Carter, 2004; Carter and Meier, 2005; Thomas, 2006).

Fortunately, this rocky start caught the attention of the Forest Service managers, and the project was recovered with improved collaboration with local counties and organizations, and a more cooperative stage was thus set for future travel planning. Although, in a graduate study on “authentic public participation” by Marianne Thomas (2006), neither the Duck Creek-Swains project or the planning for the GSENM was considered entirely successful by people who participated in both processes, the Duck Creek-Swains project took a more face-to-face, bottom-up approach, and the Forest Service was more willing to adapt its decision toward creating a more widely acceptable outcome. Because of this approach, the Duck Creek-Swains projects was seen as much more successful; the Forest Service was seen as willing to share the problem with the public and attempt to reach agreement on a solution together (Thomas, 2006). In contrast, the GSENM process held more formal public meetings, but plan revisions were done by “higher up” BLM employees, which did not appear to include the public at that stage, or sufficiently consider the input provided by the public. Additionally, the GSENM did not focus on travel management until the counties forced the issue. Once it did, the process was designed to manage for closures and recreational limitations (Blahna, 2007; Thomas, 2006).
The differences in purpose, scope and scale between the Duck Creek-Swains project and the GSENM plan had a profound effect on methods used. However, Thomas’ study generally found 1) that stakeholders will be less satisfied with the outcome of a planning decision when they are less satisfied with the participatory process, 2) that stakeholder satisfaction with a participatory process is founded upon their perception that procedural justice, trust, and/or collaboration were present, and 3) that stakeholder satisfaction with an outcome is founded upon their perception that distributive justice, relationship building, and/or sustainable decisions were present. It was also found that levels of distrust and animosity that exist prior to planning efforts must be fully recognized by agency employees, and the planning process designed to transform negative feelings into a more positive outcome for the project at hand and built upon for ongoing future participation.

Thomas’ study concluded that, in order to achieve authentic public participation in travel planning, it is important to have a solid, visually mapped inventory of routes to describe the existing condition, and, using site-specific input from the stakeholders, to collaboratively develop clear management objectives for the area. Most important to authentic public participation is a process focused on fairness (consider local expertise, increase public involvement, increase receptiveness to public input, maintain unbiased management across stakeholder groups), trust building (increased balanced management), and collaboration (increase information sharing as a means to involve the general public). In addition, it was suggested that training be made available to agency employees for improving relationships between managers and the public, and for learning from previous processes (Thomas, 2006).
Despite the high-costs of drawn-out, reactive processes, negative local relationships, appeals and litigation, it is difficult for agency leaders to commit up-front to authentic collaborative processes. This is because of a combination of factors: lack of know-how about collaboration (tacit knowledge), an authoritative organizational structure (“the way we do things” per Chojnacky, 2012), and concerns about making commitments, given limited budgets and capacity. A great deal of time, effort, and skill is required on the part of the agency to embark on authentic collaborative processes, and it is difficult for many agency leaders to accept responsibility for the uncertainty it brings with it. Increasing social science backgrounds within the workforce, including emerging leaders, and increasing tacit knowledge, should improve this situation over time. Further development of a community of practice to assist with knowledge transfer should also improve collaborative knowledge and work within the agency (Cerveny and Ryan, 2008; Meier, 2007). This is how a forest can build success upon success.

When the Dixie began forest-wide travel management following the conclusion of the Duck Creek-Swains project, stakeholder collaboration was built-in from the beginning (USDA, 2012j). The Forest Service had issued a new draft policy in 2004, finalized on November 9, 2005 as Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule (USDA, 2005). Under this new policy, all National Forests were required to designate a system of roads, trails and areas for motorized travel, and generally prohibited cross-country travel. For several years previous, the Dixie had worked on an extensive GPS inventory of all motorized routes. At the same time, the Dixie was underway with revising its Forest Plan, a process which included collaboration with a number of stakeholders over a prolonged period of many years. A working group
of citizens who had provided suggestions for motorized travel during Forest Plan revision was reconvened by a third party for the purpose of providing input on the proposed travel system and route evaluation process that would be used in Travel Planning (USDA, 2012j).

This multi-stakeholder group consisted of citizens representing motorized and non-motorized recreation users, as well as advocacy organizations representing motorized and non-motorized interests, environmental organizations, and county and state governments including Utah State Parks. This group met five times during the pre-NEPA development of the Travel Plan. During this period, a series of public open-houses were also held to raise awareness of the coming project, and gather input from the public regarding the inventory and process. A second set of public open-houses was held immediately following scoping of the proposed action. Numerous meetings were held with local and state governments, as well as the BLM, before and during the formal NEPA period. A tremendous amount of focus and effort was exerted over the course of nearly six years of by a dedicated internal planning team, the stakeholders and the public. The process had its ups and downs, and not everyone was satisfied with the decision. In the end, however, the Forest Service received only seven appeals, six of which were resolved through further collaboration, and the Forest Service was upheld on the last remaining appeal. No litigation occurred (Dixie National Forest, 2013; USDA, 2012j).

According to the Dixie National Forest (2013) the appellants included: 1) a private citizen opposed to the closure of specific routes that are being used for motorized travel; 2) a private citizen and 3) a local community foundation, both appealing (wanting) to close two existing designated motorized trails; 4) a representative from a local ATV club
opposing the decision to close several routes and generally appealing that the entire
decision was based on inadequate inventory, was not comprehensive, and should be
suspended until a better regional plan could be developed; 5) the Kane County
commission and 6) a representative from another local ATV club, both appealing several
general points, as well as the closure of an unauthorized route from motorized travel, and
requesting motorized use on a section of the Grand View Trail (currently non-motorized);
7) a coalition of environmental/conservation organizations appealing the travel
management plan decision as arbitrary and capricious and in violation of several laws and
policies, including the Nixon-era Executive Order 11644 on minimizing environmental
effects from Off-Road Vehicle use, the Roadless Rule(s), and the Endangered Species
Act. This appellant asserted that the Forest Service failed to adequately analyze and
disclose effects. In the case of each appeal, Dixie National Forest Supervisor Rob
MacWhorter and Fishlake National Forest Supervisor Allen Rowley met with the
appellants to review their issues and determine opportunities for resolution. Six of the
appeals were withdrawn due to resolutions with the Forest Supervisors (Dixie National
Forest, 2013).

The appeal from the private citizen opposed to the closure of specific routes was
resolved by determining that one of the routes had been experiencing illegal motorized
use for many years, but others should remain open due to mapping errors realized
through this resolution process (Dixie National Forest, 2013). The appeal from the local
community foundation was dismissed due to no standing (failure of the appellant to
provide comments before the comment period deadline); however, the similar appeal
from a private citizen was withdrawn due to resolution with the Forest Supervisors. The
appeal by one of the ATV clubs seeking suspension of the decision remained unresolved after meeting with the Forest Supervisor, and was dismissed with the process and decision by the Forest Service being upheld by the Appeal Deciding Officer. However, the Forest Supervisors were able to resolve the appeal with the other local ATV club by agreeing that the appropriate District Ranger would meet with the club to explore possible connecting routes between key destinations, which would be analyzed and disclosed under NEPA outside this travel planning decision. Likewise, the appeal from Kane County was withdrawn largely upon agreement to explore connecting routes to serve as key loops for motorized travel, to also be analyzed and disclosed under NEPA outside this travel planning decision. This resolution has since proven difficult due to lack of sustainable routes (too steep and erosive) and public access through private lands in the specific area (Dixie National Forest, 2013).

Potentially the most controversial of the resolutions was over the appeal by the environmental organizations, primarily because the Forest Supervisors agreed to reanalyze and reconsider an earlier decision that allowed motorized travel on certain routes. There is no requirement under the final Travel Management Rule (2005) that deciding officials must open up previous decisions for review or reanalysis, and it is expected that the new analysis will be as controversial as it was originally. Additionally, the Forest Supervisors agreed to close certain roads and not to designate a number of motorized routes located within Inventoried Roadless Areas (including trails), if they were not previously on the system before 2009 or were on the system but lacked documentation showing that they were legal system routes (Dixie National Forest, 2013).
Good results can be accomplished under a new era of collaboration in land management and planning. When the Dixie National Forest embarked on its forest-wide travel planning process, it took the lessons it learned from the Duck Creek-Swains project and remained willing to share its decision space with stakeholders. This alone represented a significant paradigm shift; an entirely different approach from the agency’s traditional top-down, authoritative style of decision-making. It is not easy for the Forest Service to take such an approach, because it doesn’t focus on the aspects the agency is used to excelling in, such as science and research. It also focuses much more on working with people, dealing with their values and emotions, and offers a bottom-up decision making process. Such an approach concerns some forest leaders as being more prolonged and complicated and therefore taking more funding and employees than annual appropriations can accommodate. It is also requires giving of significant roles and responsibilities by leadership to their staff, and also to the agency’s partners. Overall, it requires more risk-taking on the part of line-officers, as it has been hard, traditionally, to report collaborative success through targets (Blahna, 2013).

It is much better to address issues and share the burden of conflicts throughout the process (Blahna, 2013). To not deal with them early and often can actually exacerbate them in the long-run. If projects end with high degrees of conflict, that high degree of conflict will follow into subsequent projects, meaning that they will start out immediately disadvantaged by distrust and suspicion toward the agency. By contrast, positive relationship-building and management of conflict throughout processes will result in overall higher satisfaction with the process. This effect is most profound when the agency is given a higher degree of trust by stakeholders as it enters into subsequent
projects. Ironically, transparency and the sharing of power can result in agencies retaining greater decision discretion in future projects, because people trust them. This is clearly about more than just getting through individual projects; it’s about the kind of legacy an agency and its local units can create through its approaches (Blahna, 2013; Shindler, 2013).

When its final forest-wide travel plan was released in 2009, the Dixie continued its collaborative process into the next phase. The Dixie issued an implementation plan and got to work on the mapping, signing and decommissioning of various routes, as decided in the travel plan. A multi-stakeholder task force continues to work with the Dixie to assist in the implementation process. This task force is comprised of employees from the Dixie and Fishlake National Forests, elected officials in affected communities and areas, Southern Utah University, Utah State Parks and Recreation, Ruby’s Inn, and others (Glidden, 2012; USDA, 2010c; USDA, 2012e). Overall, the Dixie continues a positive working relationship with environmental organizations, OHV enthusiasts, and state and local governments. Over ten years in the making, this community partnership consists of entities and individuals in southern Utah that have been at odds with each other, and with federal land managers, for many years (Westby, 2004; Zaffos, 2011). This relationship is aligning a more consistent understanding and set of expectations between the Forest Service, recreationists, and other stakeholders for how the Dixie should be managed.

The Dixie’s ongoing implementation of travel management includes information and contact with riders on the ground. The Dixie has provided information on the rules for OHV riding, expressed through local and national agency information and web links to Utah’s requirements, as well (Glidden, 2012; USDA, 2012e). The Dixie’s web page
includes information on recreation etiquette and tips for reducing conflict with other recreationists, such as Leave-No-Trace messages. Information is provided on riding safety, how to be better prepared for a ride, and ways to add enjoyment to a trip. High quality maps are available that show designated motorized routes for the Dixie, and a map was produced after the Duck Creek-Swains project that shows OHV riding trails and loops, color-coded, with corresponding markers located on the ground. A number of informational kiosks have been installed at various trailheads and route junctions. Much of this effort and funding has been provided with assistance by the State and even local counties, as well as by grants received from Yamaha Motor Corp, a company that has made efforts to promote responsible riding.

OHV rangers are hired by the forest to provide one-on-one visitor information to riders, while they patrol OHV riding areas. Although they also exist to enforce the rules, their most effective purpose is their physical presence to meet-and-greet, to help riders understand expectations for safely and proper use of the area, and to provide instructions on the use of maps and signage. Reaching through media technology, the Dixie has also developed an outstanding podcast promoting conservation and user ethics through a presentation on an OHV trail improvement project within the Duck Creek-Swains project area (Glidden, 2012; USDA, 2012f). Use of this media, as well as podcasts and a variety of other methods for reaching the public, should result in ongoing improvements in visitor cooperation and involvement.

The Dixie’s collaborative work has been discussed and examined at a handful of agency and non-agency workshops and presentations over the years, in case studies, and extensively in a “Lessons Learned” paper assembled by the U.S. Institute for
Environmental Conflict Resolution (Environmental Law Institute, 2010; IEN UV, 2009; USGS, 2006; USIECR, 2010). Although not without some points of criticism, the Dixie’s collaborative Travel Planning process has generally been portrayed as a noteworthy success and a good example of transparency. Because it has remained committed to collaborative processes, the Dixie is accumulating a series of successful projects, particularly in travel plan implementation, following the Duck Creek-Swains and the Dixie Motorized Travel Plan decisions (Carter, 2004; Glidden, 2012; USDA, 2010c). Through the way it handled these projects, the Dixie found a way to manage its OHV recreation, develop collaborative relationships, and expand its tacit knowledge.

**Conclusion**

The Dixie’s projects illustrate why, as Blahna suggested (2007), managers must shake their reaction to high-use areas as ‘problems’ that require use limits to reduce or eliminate impacts, and instead explore them as ‘opportunities’ to provide preferred experiences, contain impacts, and thereby prevent shifting use to new areas. Managers must develop tacit knowledge, including an understanding of Forest Service history, the evolution of recreation management, research and thinking, as well as collaborative processes, and then skillfully place them in the proper context with the circumstances they now face on the ground. Otherwise, it will be difficult for managers to overcome the serial “default approach” of allowing recreational uses or even encouraging them, then deeming the impacts and use levels as unacceptable, with subsequent efforts to restore impacted areas to a more “natural” state. They must understand that this approach is likely to lead to visitor dispersal and an increase in regional impacts, while not resolving problems at the
original locality, with the result being expansion of impacts into new areas. This takes
the Forest Service, and the public, down a road of increasing, wasteful expenditure of
energy and resources over the long-term; the opposite direction of where it should be
going. Certainly this is not sustainable.

As Joseph Tainter described in his book *Collapse of Complex Societies* (1988), as
societies evolve, system complexity may outstrip that society’s own institutional capacity
to manage such systems (Tainter, 1988; Williams, 2013). All complex systems become
too expensive in the attempt to solve problems, and eventually reach diminishing returns.
In the end, complex systems must simplify by undergoing societal collapse or a deliberate
decision to return to a more simplified system. Science, too, adds to the complexity by
allowing contesting parties to assemble their own bodies of relevant and legitimate facts,
possessing a variety of disciplinary perspectives. Despite the progressive expansion of
scientific understanding, uncertainty persists and grows because of disunity of these
perspectives. This problem is further amplified by diverse political, cultural, and
institutional contexts that are involved in the conduct and interpretation of scientific
research. A strong case can be made that the growing complexity of knowledge
decreases institutional efficiency, increases scientific uncertainty, and amplifies policy
conflict (Williams, 2013).

The Forest Service, and its approaches to recreation and resource management,
started out fairly simple in its purpose and activities, but today the agency faces complex
problems that perhaps represent an outgrowth of our society’s overall complexity. What
is asked of the agency now is immense in terms of complexity, and the expense of
operating is truly a concern for the future. It is hoped that it does not result in a cessation,
or dramatic collapse of Forest Service operations, especially driven by leaders and programs not being able to unify in improving this situation.

To even begin to understand the agency’s many management dilemmas, one must look into a 150-year span of its national, and international, history. It would take no small commitment of time for employees to do this, and that would require an intense personal interest on the employee’s part. It is important that all Forest Service employees know more about the agency’s past however, beyond the nostalgia, in order to be realistic and vigilant against approaches that no longer work, toward approaches that would keep the agency and its management from falling into collapse or simple irrelevance with the public. The agency and its capability in sustainability cannot be supported by continuing to trend toward stagnation or decline, driven by the barriers to effectiveness discussed earlier. It is hoped that those who make the decisions will obtain a broadened understanding and can work more quickly and collaboratively to simplifying the agency’s complex problems.

Those solutions are not likely to be found in traditional approaches to the transfer of knowledge from expert to practice, or leader to the field, but from the bottom-up and including collaboration with stakeholders. Organizational learning might occur if there are channels for seeking and better integrating the local knowledge of practitioners, and developing tacit knowledge. Local practitioners are a vital part of the network and learned knowledge must be distributed as a product that occurs within a community of practice (Williams, 2013). Perhaps improved degree programs, an evolved group of professionals equipped with tacit knowledge that includes collaboration, informed leaders who are willing to bring this profession and knowledge confidently to the table, and an
effective community of practice can expedite a trend toward improvement in recreation management and sustainability for the future.
CHAPTER 6: REFERENCES


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