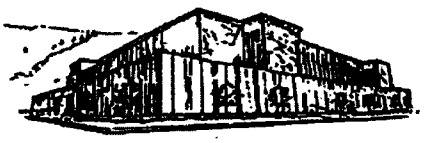
2006

Utilizing the citizens' forest Restoration Principles: An evaluation of the Knox Brooks Stewardship Project and proposals for integration into the Forest Service structure

Adam S. Rissien
The University of Montana



UTILIZING THE CITIZENS' FOREST RESTORATION PRINCIPLES: AN EVALUATION OF THE KNOX BROOKS STEWARDSHIP PROJECT, AND PROPOSALS FOR INTEGRATION INTO THE FOREST SERVICE STRUCTURE

By

Adam S. Rissien

B.S. University of Nebraska at Omaha, 1997

presented in partial fulfillment of the requirements for the degree of

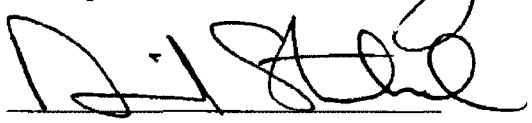
Master of Science

The University of Montana

May 2006

Approved by:

Chairperson



Dean, Graduate School

5-19-06

Date

Table of Contents

Appendices

List of Tables

List of Figures

Introduction

Reading through the Forest Service's quarterly project status reports, one may be struck by how many times restoration is mentioned. A trend seems to have swept the agency where restoring ecosystems is now one of their central goals. To this end, silvicultural treatments are often advanced as a means to restore historical conditions thereby making the forest more healthy and resilient to natural disturbances. This approach has brought criticism from those who do not agree that this constitutes good restoration and claim that the agency is only working to advance a timber extraction agenda directed by congressional and executive spending priorities. As an alternative, a number of environmental groups met with scientists and practitioners in a series of conferences to develop a framework for forest restoration. These Restoration Principles, shown in Appendix A, offer guidance and policy reforms for implementing good restoration projects. However, the differences between the Forest Service's framework and the Restoration Principles' beg many questions: What is good restoration? What are the Forest Service's spending priorities and how are they decided? How does the agency fund restoration projects and does it constitute good restoration? What changes in current policy could integrate the Restoration Principles into the Forest Service's framework?

This paper explores these questions by first examining restoration's philosophical and terminological underpinnings followed with a discussion of two restoration frameworks. Next, chapter two looks at the appropriations process, the Forest Service budget and ways the agency funds restoration. Chapter three offers an example of how restoration work was funded on the Knox-Brooks Timber Sale and Road Rehabilitation Project followed by a comparison with the Restoration Principles. Lastly, chapter four

examines alternatives for restoration funding and ways to integrate the Restoration Principles into forest policy primarily through the budgetary process.

Chapter One – Restoration Philosophy, Higgs and the Principles

Restoration seems like a fairly innocuous word. It brings up images of old cars, buildings or paintings being brought back to their former glory, and conjures ideas of times past with the hope that they can be relived. It is a word that most do not question or think of as controversial. This, of course, is an idyllic view that discounts what many people know: restoration is a value-laden can of worms that has opened up across our landscape and vernacular. It is fraught with ethical dilemmas and practical challenges.

The last twenty years have seen an intense effort to define and shape restoration. Unsurprisingly, this topic has led to many spirited discussions, as well as the evolution of several journals, new organizations, innumerable conferences, and a general sense that no one agrees on what restoration actually means, let alone what would constitute good restoration. In an effort to clarify this issue, Eric Higgs, along with several contemporaries, has suggested a framework in his book titled Nature by Design that clarifies what good restoration ought to entail. Another such endeavor originated with environmental groups that sought to develop a forest restoration policy to counter, in part, the perceived misuse of the term by our public land management agencies and industrial special interests. The result was an article titled *A Citizens' Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria.* The following sections describe and compare both frameworks after brief explanations of restoration philosophies and definitions.

The Philosophy of Restoration

Restoration ethicists have had an ongoing debate surrounding the topic since the early 1980's. In particular, Robert Elliot, in 1982, wrote an article titled *Faking Nature*

responding to mining interests' claims that environmental damage was acceptable because the areas could be fully restored to their original condition. Elliot argued, "...wild nature had a value-adding feature that could not be restored" (Elliot, R., 1997, p, vii). The value-adding feature stems from natural processes and restoration, Elliot claims, robs an area of this attribute. Therefore, restoration can never replace originality and the site's value is forever lost. Since the article was published many people have weighed in on one side or the other.

Intuitively one would think restoration and preservation would complement each other, however, sides were quickly drawn among environmental philosophers. In 1985 William R. Jordan III authored his seminal article *Sunflower Forest: Ecological Restoration as the Basis for a New Environmental Paradigm* where he criticized perspectives that set nature and culture apart. "The real challenge of environmentalism is not to preserve nature by protecting it from human beings or rescuing it from their influence, but to provide the basis for a healthy relationship between nature and culture" (Jordan, W.R. III., 1997, p. 21). His alternative acknowledges the tension between humans and nature that arises from the fact that people are more than "plain citizens" of the world. However, such tension should not result in the sequestering of the two. Jordan asserts this tension can be resolved not by denying western culture, but by creating rituals through ecological restoration that establish a new relationship with nature (Jordan, W.R. III., 1997, p.30). He explains that restoration can replace the negative dualism that sets people apart from nature resulting in a new reinhabitation of the natural world. Even more, he asserts instead of too many people using nature there are not enough and the

goal ought to be to create positive relationships with all landscapes rather than trying to keep human influence out of the natural world.

Jordan's vision was precisely what environmental activists such as David Brower feared. Eric Higgs recalls his address to a gathering of restorationists: "He caused quite a stir at the first SER conference in Chicago in 1989 when he claimed that restoration should be opposed at all costs: it would distract the serious work of environmentalists in protecting precious places" (Higgs, E. S., 2003, p.283). Underlying Brower's fear was Elliot's claim: restoration is just industry apologia for damage caused by extracting natural resources.

However, restorationists recognize a difference between a restored site and its original condition while still arguing the merits of the practice. In his editorial, *Restoring for Natural Authenticity*, Andrew Clewell answers the question; "Can we put an ecosystem back the way it was with historical authenticity? The answer is no for the very reason that a restored ecosystem is natural and not artifice: restoration cannot guarantee a particular endpoint" (Clewell, A. F., 2000, p. 216). For Clewell it is enough that practitioners begin the process after which, the work is done and whatever happens is the appropriate result. To manipulate towards a specific outcome would be the same as gardening or landscaping. In this manner Clewell distinguishes between historical and natural authenticity.

Eric Katz takes issue with this view, arguing that restoration negates natural authenticity by interjecting human arrogance in the form of design. Katz asserts human intentionality in the act of restoration is the supreme thief, robbing natural systems of its

value and falsely assuming that people have the ability to mimic or replace natural processes.

Jordan and Katz represent two extremes of the philosophical debate, which Andrew Light suggests (at least for Katz) is limited to the ivory tower of intellectualism. In regards to restoration, Light advocates environmental pragmatism that speaks to people's moral intuitions. He advocates for the inclusion of practitioners who can speak to the value of restoration on a personal level, thereby bringing the discussion out of the theoretical debate of natural authenticity. However, Light still engages in this debate when he responds to Katz's argument that restoration is the imposition of human dominance, which he identifies as KR4 in his article *Ecological Restoration and the Culture of Nature: A Pragmatic Perspective*. In it he states, "But even if I grant this point that restored nature is not really nature, KR4 is still false because it is arguably the case that restoration does not dominate nature in any coherent sense but instead often helps nature to be free of just the sort of domination that Katz is concerned about" (Light, A., 2000, p. 57). Light argues that even if the restored area cannot qualify as natural, it could still be valuable for ecosystems. He offers the removal of human induced impediments to natural recovery as an example of restoration without dominance. Light also asserts that Katz is confusing mitigation with restoration explaining the former does not look to nature for its design. Another major argument of Light's begins with the recognition that humans are in a moral relationship with nature and the process of restoration results in a positive value for each (Light, A., 2000, p. 62). Using the context of healthy and abusive relationships, restoration is the practice of correct moral behavior that can result in a good relationship. The implied quality of reciprocity is also important because while one is

doing right by nature the process restores a person's connection to it (Light, A., 2000, p. 64).

Higgs weighs in on the debate responding to Elliot and Brower by stating, "...it would appear at least so far that restoration has, if anything, underscored the importance of preservation and conservation of precious ecosystems. After all, most restorationists are attuned to the fact that restoration is a regrettable necessity in wake of wanton human activity" (Higgs, E. S., 2003, p.220). Higgs recognizes that originality cannot be replaced and it is better to not need restoration in the first place. In this view preservation and restoration would complement one another.

In sum, the main arguments against restoration are that it will provide industry an apologia for damaging ecosystems; it will take away from preservation efforts; it is the practice of human hubris; and it ultimately robs nature's inherent value. Restorationists respond by explaining restoration is not an excuse for exploitation; it does not seek to replace originality that ought to be preserved wherever possible; it can provide a way to restore human relationships with nature; and it is not a practice of human domination that robs nature's inherent value. The last of these assertions is more of an ontological debate that can go on without resolution. Light concedes this point and calls for a more pragmatic perspective.

Restoration Defined

The ideal starting point for establishing necessary components for a restoration definition is the examination of Higgs' comparison of other similar words that are often used interchangeably: reclamation, remediation, rehabilitation, revegitation, reinhabitation and regeneration. "To reclaim something means to rescue it from an

undesirable state" (Higgs, E. S., 2003, p. 99). The current application is commonly associated with mines and more broadly resource extraction in general with the ultimate goal of returning productivity to an area. This however does not necessitate that it function as it did before. The same can be said of remediation, which focuses on correcting past degradation but not necessarily to its previous condition. Rehabilitation is different because it does seek to return past conditions, but it may result in new ecological functions that were designed for a particular use thereby interjecting a high degree of human intentionality. Revegetation is simply returning plant cover to an area, though there is a distinction between active and passive, and neither requires that the species be native. Reinhabitation is an expansive concept offered by Stephanie Mills in her book In Service of the Wild with the goal of, "learning to live-in-place in an area that has been disrupted and injured through past exploitation...restore its life-supporting systems, and establish an ecologically and socially sustainable pattern of existence within it" (Mills, S., 1995, p. 7). Higgs' description of regeneration is similar to rehabilitation except he implies that there may be less intentionality even if the results create new ecological conditions (Higgs, E. S., 2003, p. 101). The conclusion drawn from these similar words is that a project qualifies as ecological restoration if it results in a higher degree of ecological integrity while incorporating the area's history (Higgs, E. S., 2003, p. 101). Restoration's distinguishing factor is the concept of assisted recovery, which intentionally quickens the natural process toward a planned goal. This differs from unassisted restoration: "when the autonomous recovery processes have produced something undistinguishable from what had been present prior to the disturbance," suggesting that if it is distinguishable then it is not restoration (Higgs, E. S., 2003, p.

116). Higgs advises against using this term because it insinuates that restoration can take place without direct human involvement. Following this logic, the term passive restoration is not appropriate and one should use natural recovery in its place. Many who feel given enough time any area can be restored without human intervention overlook restoration's defining quality that it must contain some degree of intentional loyalty to resemble pre-disturbance conditions, the so-called "norm." Those advocating a completely passive role disregard an important fact; "No matter how much we might want to absent ourselves from continued involvement in the life of an ecosystem, there are occasions where doing so would reflect the greatest disregard for ecological integrity" (Higgs, E. S., 2003, p. 118). The fine distinction between the different words and concepts may seem like splitting hairs for the restorationists concerned about just getting work done. However, for policy makers the importance of definitions cannot be overstated and Higgs provides clear requirements for distinguishing restoration from the rest of the "re" words. The next section explains how Higgs integrates his definition into a broader conception for what qualifies as good restoration, which is necessary in order to compare his concepts with those in the Restoration Principles and see where the two may diverge.

Eric Higgs' Ecological Restoration

Higgs' framework for ecological restoration is broken into four main components: ecological integrity, historical fidelity, focal restoration and wild design. These provide a positive approach to understand and correct past harms, learn ways to build relationships with ecosystems and their components, and proceed with respectful intent to design good restoration projects.

Ecological Integrity

"James Kay, a systems theorist at the University of Waterloo, proposes that *integrity* is an all-encompassing term for the various features-resiliency, elasticity, stress response and so on- that allow an ecosystem to adjust to environmental change: 'Integrity should be seen as an umbrella concept that integrates these many different characteristics of an ecosystem, which, when taken together, describe an ecosystem's ability to maintain its organization" (Higgs, E. S., 2003, p. 122). This definition appeals to Higgs because of its adherence to wholeness and he identifies two approaches that complement ecological integrity: interpretive and analytic descriptions. The first concentrates on qualitative elements of what restoration ought to be such as William Jordan III's idea of restoring human-nature relationships. The second focuses on quantitative factors that are measurable or calculable and thereby provide some means to assess a restoration project's success. One problem with measurable indices is that they may not be transferable to other ecosystems, which is why quantitative factors may need to be limited to specific ecotypes (Higgs, E. S., 2003, p. 123). It is interesting to note that Higgs makes a distinction between integrity and health. He claims the latter does not provide "quantitative specificity," and "...there is so much variation in ecosystems that criteria for ascertaining health are either too broad to be practically useful, or too specific to capture a full range of meaning" (Higgs, E. S., 2003, p. 123-24). Integrity avoids this pitfall by adhering to some degree of historical fidelity: Higgs' next concept.

Historical Fidelity

Higgs states, "Historical fidelity means loyalty to pre-disturbance conditions, which may or may not involve exact reproduction – remember that there are social,

economic, cultural, political, aesthetic and moral goals *from the present* to factor in as well" (Higgs, E. S., 2003, p. 127). He recognizes the problems and frustrations inherent with using history, and acknowledges that it can never be completely objective because history reflects only the interpretations of those that have gone before us. In other words, there is a degree of subjectivity involved with historical references therefore it becomes more of a value decision rather than a scientific one. Most restorationists agree that originality cannot be achieved once an area is degraded, so the degree they ought to adhere to historical fidelity is unclear. Higgs offers some guidance with his idea of historicity, which has three basic components: nostalgia, narrative continuity and depth of time.

Higgs suggests that the reasons people focus on the past is, in part, because they believe some aspect of it is better than current conditions. In regards to ecosystems this is the case in the truest sense; nostalgia is yearning for something lost. Of course this is a construct that may not reflect reality. No one would readily guess that a barren, denuded landscape is what ought to be in place of a lush forest that was a result of past fire suppression. Likewise, few would call for wholesale logging to return the area to its previous state. In other words, "there is no escaping this subjective dimension of ecological restoration: our knowledge of history and what we prefer from history is always contingent on contemporary beliefs" (Higgs, E. S., 2003, p. 144). However, this does not lessen the fact that ecosystems today are much more degraded than in the past. Nostalgia can invoke an emotional appeal for past ecosystems while the past also offers a host of varying models. Higgs suggests this should be enough of an explanation for why artificiality should not supplant past ecological conditions. However, his example is not

very convincing because its logical construct seems hollow. The contention, that nostalgia evokes emotion so therefore we prefer past ecosystems, does not explain how this emotive response will overcome our assumptions of those past conditions.

The perceptions of events are bound by cultural variability between younger and older generations, changing as time moves forward. Even more, as our understanding of the past increases, our expectations for the future change. Narrative continuity suggests that there is constant and consistent knowledge linking past to present based on the stories told by older generations. These stories are framed in the context of community. When applied to restoration this has significant connotations because of the stories societies tell about place. If only human stories are told, or ones that do not include an accounting of natural processes, then our conceptions of future conditions are significantly diminished. "For value to form and endure there must be continuous understanding of the place, or the possibility of recovery of such continuity, as is the case when the history of a place is researched and communicated...We value old growth because of its continuity" (Higgs, E. S., 2003, p. 154).

Time depth, the third requirement for historicity, is not only how far back one views history, but also the interactions between people and place. It puts continuity into perspective. Implicit in time depth is the sense of rarity. A place will hold more value not only if it is old, but also if it is scarce as well. This is another reason why old growth has more importance than other forest types.

Historicity illustrates why a fabricated place does not hold the same value as a wild one. "It may be unique but it is easily reproducible, its continuity depends on manufacturing narratives, and it is too new to have its own history" (Higgs, E. S., 2003,

p. 156). This same observation explains why corporate or industrialized restoration projects lack authenticity. Higgs warns of projects complete with corporate logos and I suggest that it would not be to far-fetched to imagine intellectual property rights claimed for specific restoration projects or methodologies. This is why narratives of place become so important. Good restoration can be qualified by its adherence to historicity because it creates value through nostalgia, stories linking communities to place and the sense of historical reach (Higgs, E. S., 2003, p. 158). However, theorizing does not offer any clear direction for practical restorationists who need to know how historical fidelity fits into the actual work. The need for clarity is evidenced by the tendency for some to show past pictures and claim that this is the way a place ought to look.

The concept of reference conditions helps refine the use of historicity, but this is a complex issue with many factors. Overall, restoration project goals develop as a result of comparisons between past information and an evaluation of current conditions. The key is in the accepted information. Most important, is that it not include just one specific point in time. In other words, a snapshot is fine to use as a baseline or benchmark to illustrate past conditions, but it does not account for ecological or evolutionary change; long-term processes are not reflected in a picture (Higgs, E. S., 2003, p. 163). Therefore, reference information must include accurate and extensive knowledge of variability. Before talking about this, one needs to take into account scale. If the focus on an area is too wide then smaller issues get ignored, and vice versa. In other words, "one might presume the best way to obtain reference information is by measuring and comparing the oldest available nearby site. Such sites, however, may skew the results with the oldest instead of the most typical (or rarest or diverse and so on) ecosystem" (Higgs, E. S.,

2003, p. 163). This is why an adequate range of variability is needed and one that includes more than just the change in natural conditions.

Historical ecology takes into account the roles past peoples played in shaping their environment. The useful term, historic range of variability, takes into account natural and human factors. The challenge for restorationists is how to account for cultural practices that have shaped an ecosystem when the goal is self-sustainability. In this scenario, humans are only considered as part of the problem and it does not address co-evolution. This subject is further explored in the concept of focal restoration.

When considering historic ranges of variability three other problems need to be considered: the incompleteness of information, uncertainty and industrial rates of change. The old saying "garbage in garbage out" seems appropriate when considering the accuracy of information, especially since the further back one goes the less available the data. Uncertainty speaks to the fact that even with best information, the outcome becomes less predicable as the range of variability is expanded. That is why it is necessary to limit the range only to probable outcomes, but this is complicated when the current conditions far exceed long-term ranges of variability. This point speaks to the third issue, industrial rates of change. Unfortunately, there is no obvious solution to this problem and it only compounds the uncertainty of any restoration project. However, Higgs argues, that this should not be a reason to discount the use of history in its entirety because without some degree of loyalty to the past, restoration loses its meaning. This leaves us with the obvious question of when to use historical ranges of variability and to what degree, which is the focus of this chapter's last section.

Focal Restoration

For Higgs, restoration is more than just assuring ecological integrity and historical fidelity; it is also about people and culture. This was hinted at while explaining historical ranges of variability. Focal restoration expands the human role in nature by seeking to reduce the separation of nature and people along with the cultural preference by some for development over wildness. Ideally, restoration activities would involve communities where people work together to improve the ecological condition of a particular site thereby building a relationship between people and natural processes. The concept of focal comes from Albert Borgmann's device paradigm where he explains "things" are anything that is situated in a societal and cultural context, and gain value through place and tradition. Devices are things outside of this context. "A focal thing is distinguished in Borgmann's sense from a device because it has presence and continuity" (Higgs, E. S., 2003, p. 243). Integrating this into restoration is an easy transition because any practice takes place in within cultural boundaries. Rather than trying to divorce the practice from the people, focal restoration promotes constructive roles for people within nature. It also addresses the fact that First Nation peoples have played a significant role in shaping landscapes, more in some areas and less in others. Instead of stereotyping or grouping all of past human actions together as one broad conception, the joining of historicity and focal restoration challenges practitioners to take a hard look at how ecological process may have coevolved with people. Even more, reviving past cultural practices may be necessary for restoration to take place. The use of the device paradigm allows for linking people and restoration work together while rejecting over-professionalization and commodification of the practice as a whole and as a specific product. Restoration can

foster a sense of community and keep the practice out of the realm of corporate interests as well as those who clamor for an exclusive technical approach.

Wild Design

The fourth component of restoration is the concept of wild design. Higgs states, "we need to acknowledge that restoration is fundamentally a design practice...no matter how much we try to attune ourselves to the interests of ecosystems, to bring something back to the way it was, or honor our relationships with natural processes, we end up exerting some of our will. Hence design is unavoidable" (Higgs, E. S., 2003, p. 274). Restorationists often rebel against this idea, charging that their work is not the same as a landscape architect who is dependent on aesthetic goals. Here they are correct because the restoration design is informed not by personal whim but rather by ecological need and historical reference. In addition they recognize that ultimately when a project is implemented natural processes take over and shape the results. Knowing this and planning for it is what Higgs means by wild design. Embracing design recognizes the inherent intentionality in all restoration practice. It also means planning for more than just the scientific aspects of a project. A wild designer anticipates people's role in the project, planning for focal restoration. This is the fundamental difference between a scientific, goal-orientated process and a wild design. Though ecological integrity will always be the overall purpose, incorporating science, judgment and participation ensures the best design (Higgs, E. S., 2003, p. 287).

Restoration Concepts Combined

The intersection of ecological integrity, historical fidelity, focal restoration and wild design offers an expanded view of what restoration means as a philosophy and a

practice. Restoring ecological integrity ought to be the primary goal but not the only goal. A myopic focus on returning an area to a specific point in time is not only unachievable, but discounts fallacies of reference information. People matter in restoration. Policy ought to foster community involvement and work to prevent the commodification and professionalization that locks people out of the process. Finally, restoration projects should be designed with more than scientific goals, but still recognize that natural process will shape the results. With this expanded view more questions are raised than in traditional approaches: what role does history play, how is historicity practically realized, what are the complications of Higgs' approach when applied to different ownerships, what are the fundamental philosophical conflicts and how are they resolved? Higgs' contribution is not meant to provide answers, but rather to illustrate the questions themselves. It is up to others to address these issues and the following section offers some guidance.

The Restoration Principles

The Restoration Principles were designed to provide a general framework to guide policy and projects by recognizing three distinct components: ecological forest restoration, ecological economics, and communities and the workforce. These core principles were formulated over three years at national conferences in which environmental groups, forest practitioners and scientists came together in an effort to guide restoration policy and practices. A major impetus for these conferences came from new federal policies such as the Healthy Forest Initiative that use restoration as an excuse to log in old growth stands and other places with great ecological significance. Much of the Principles integrate the concepts developed by Higgs: "The restoration principles

covered here are predicated on the assumption that successful ecosystem restoration must address ecological, economic, and social needs, including community development and the well-being of the restoration work force (that is, in the spirit of an expanded approach to ecological restoration; see Higgs 1997)" (DellaSala, D. A., et.al., 2003, p. 15).

Ecological Forest Restoration Principle

This core principle seeks to strengthen ecological integrity through the restoration of natural processes, which would increase resiliency to disturbances. Though overall the Principles seek to integrate all three core concepts, this one is the primary objective sought for any restoration approach. Compared to the others, the ecological restoration principle is explained at length with numerous sub-principles.

First is restoration project planning, requiring restorationists to, "Document all restoration projects in the context of a restoration assessment and appropriate restoration approaches that restore ecological integrity" (DellaSala, D. A., et.al. 2003, p. 17). A significant acknowledgement is made in this section to the fact that ecosystems are highly complex and even the most well-intentioned project may have unintended consequences. The authors stress a precautionary approach where if there is a high degree of uncertainty or controversy then the burden of proof falls on the project's proponents and even then the project's scope should be small. More direction is given within the appendix that provides a pseudo checklist for evaluating or guiding a project. Some key highlights are its focus on appraising the available workforce, assessing budgets and securing funding before a project is implemented, prioritizing tasks based on ecosystem integrity and using the least damaging techniques.

The next sub-principle is the forest restoration assessment directing planners to "conduct a restoration assessment prior to restoration activities," which requires them to "1) identify the root causes of ecosystem degradation at multiple spatio-temporal scales, including eco-regional, intermediate, and site-specific; 2) determine appropriate methods for restoring degraded systems; and 3) create a spatially explicit prioritization of restoration needs across spatial scales" (DellaSala, D. A., et.al. 2003, p. 17). Perhaps the most crucial part of the planning stage is the three levels of spatial analysis.

At the regional level the assessment strives to describe and assess specific ecoregions and the areas that link them together. Restoring specific places that are needed for connectivity are given the highest priority. The intermediate level assessment is measured by whichever unit the planners use. This is not arbitrary; rather it provides flexibility to choose an appropriate scale such as a basin, sub-basin or watershed and to identify places with high ecological integrity so priorities can be set linking the ecoregional analysis with the site-specific project. The site-specific assessment is the more traditional planning with which the restorationists are most familiar, however the Principles provide some unique direction. Primarily the assessment seeks to determine the best restoration treatments and methods. It requires that information must include ecological reference conditions that provide for native species and endemic processes. The focus here is on the best information whether that is provided by historical records, current data or a combination of the two. Priorities are ranked according to the likelihood of success where there is low risk or where inaction would do the most harm. Special attention is given to linking site-specific work to the broader spatial analysis. Common to

all three levels is an assessment measuring cumulative effects and some recognition of historical factors.

The approaches sub-principle uses the assessments to determine areas for protection and the levels of passive or active restoration. This is a unique characteristic because it directs restorationists to identify areas with high ecological integrity and call for its preservation. Furthermore, it advises that any active restoration work in these areas must meet high scientific and community support standards, and only in cases where no other alternative will work. The approaches sub-principle then lists criteria for passive and active restoration with the former focusing on removing barriers to unassisted recovery. Active restoration concentrates on "...situations where inaction might lead to the destruction or loss of natural processes or permanent decline of a species, stream function, or rare habitat type, or where it can be demonstrated that active restoration will greatly accelerate the return to a higher state of ecological integrity" (DellaSala, D. A., et.al. 2003, p. 22).

The community protection zone (CPZ) sub-principle is a response to the confusion between treating an area for wildfire protection and using fuel reduction work to restore ecological integrity. The criteria specifically call for private landowners to treat the home ignition zone, a 60-meter area around a structure. In addition, a 500-meter defensible space, which may include cross ownership, should allow firefighters a margin of safety and protect community buildings. In essence, the CPZ is an area where local residents and federal agencies work together to ensure people's safety. The highest priority is not ecological integrity, and there is a clear distinction between restoration and community protection work. The implicit statement is that fuels reduction work outside

the CPZ should not be done in the name of protecting people's home because restoration then becomes an excuse to log trees. It should be noted that the CPZ sub-principle does acknowledge fuels reduction work as a restoration tool when implemented to return ecological integrity.

The adaptive management sub-principle is the final category for ecological forest restoration. It states that "monitoring and evaluation must be assured before restoration proceeds, and be incorporated into the cost of the project...(also) due to high levels of complexity, uncertainty and risk, restoration requires an approach that is careful, flexible and able to respond to change and new information."(DellaSala, D. A., et.al. 2003, p. 18). Another key component to adaptive management is the requirement that all data be made available to the public in an understandable format. These efforts are designed to allow for change at any level of planning and assessment. Though it is the last topic, the importance of monitoring cannot be overstated, which is why the point is made to secure funding before the work begins.

Ecological Economics

The Economic Framework principle requires a funding mechanism that encourages ecological restoration while eliminating the incentives for environmentally degrading practices. The implementation criteria includes a call for reforming the way current federal restoration projects are funded, placing the emphasis on ecological goals partially through the use of best value contracting. Furthermore, the criteria require that restoration projects should not be funded from commercial extraction. These two requirements clash because "best value" currently translates into stewardship contracting that trades goods for services. The Principles do allow the sale of restoration byproducts,

but these should not offset the project's costs. This is the major difference from stewardship contracting, and an example where policies need to change in order to divorce restoration from the amount of by-products produced. It is important to note that best value determinations seek to assure the quality of the work partially through assurances that require workers to have a proven track record with specific knowledge of the project's ecosystem. They also must be from local communities, and favor displaced or mobile laborers who are defined as migrant workers or unemployed loggers.

The criteria have specific details for restoration on private lands. It calls for sharing ecological information and providing incentives for projects. A cooperative forestry program should be created to help with this effort. Funds are to be established with reduced interest rates that encourage longer timber rotations on private forestlands. Private landowners that have threatened or endangered species should be provided tax breaks and public funding for restoration to improve their habitat. Finally, established conservation funds should be directed toward the purchase, security or restoration of critical habitats.

Community and Sustainable Work Force Principle

This core principle is designed to "make use of or train a highly skilled, well-compensated work force to conduct restoration," and it is divided into two subsections (DellaSala, D. A., et.al. 2003, p. 23). The first is titled the Community/Workforce Sustainability Principle. It places emphasis on long-term community interests over short-term or non-local economic gains. Stakeholders are encouraged to advance policies that would build a community-level ecological restoration infrastructure promoting local workers and businesses. This includes each stage of planning, assessment and

implementation and would ensure equal access to all workers. In addition, policies should be created that maximize the value of restoration by-products.

The quality job criteria provides for employment security and fairness. It calls for allowing workers to organize, mandates a living wage, and requires fair hiring practices among diverse job pools. An apprenticeship program is encouraged that provides training and certification opportunities. At the heart of these criteria is a balancing of social needs and ecological restoration goals.

The Participatory Principle is meant to assure the inclusion of a broad representation of interests. Even more, it directs that at all levels of restoration the general public should be involved to the extent practicable. In regards to public lands, it states that one group or community should not dominate the process. The participatory spirit being encouraged is meant to build consensus among all stakeholders and to foster a sense of ownership for community members in restoration projects.

Higgs and the Principles

The Restoration Principles mirror Higgs' framework in significant ways. Restoring ecological integrity is the central theme of the Principles, but they clearly state that this cannot be achieved without a balance of all three core principles thereby mirroring Higgs' assertion that good restoration needs all four of his concepts. Even though each has the goal of restoring ecological integrity, key differences are evident upon close examination.

As one compares Higgs and the Principles, a departure is seen between definitions. The latter emphasizes passive restoration wherever possible, and uses passive recovery interchangeably with restoration. According to Higgs, unassisted restoration

refers to a return of conditions present prior to disturbance and passive recovery does not require this element. The Principles do not address if passive recovery ought to result in pre-disturbance conditions. Higgs maintains that the essential requirement for restoration is the utilization of history to some degree. The Principles do not offer an explicit restoration definition, let alone a definitive statement about the role history plays in a good restoration project, but they do make some tenuous references.

Within the appendix under the site-specific assessment criteria it states, "Establish clear links to the spatial and temporal issues identified in the ecoregional and intermediate assessments," and instructs that data include, "associated ecological reference conditions (reference sites or ecological conditions that support[ed] native biodiversity and ecological processes) that account for resilient and dynamic systems..."(DellaSala, D. A., et.al. 2003, p. 21). Earlier, reference is made to "spatiotemporal scales" and the Principles recognize "native forest ecosystems operating within the bounds of historic disturbance regimes" represent areas of high ecological integrity (DellaSala, D. A., et.al. 2003, p. 17). The loose mention of temporal issues, spatiotemporal scales and historic disturbance regimes do not constitute a clear position on the extent history should inform the goals of a restoration project. Notably absent is Higgs' concept of historicity. Ideas of nostalgia, narrative continuity and time depth do not appear at all in the Principles.

The second core Principle is ecological economics and notably Higgs does not address the role funding plays in dictating projects. The Principles specifically call for a change to federal funding mechanisms. In this regard there is a fundamental difference between the two: Higgs does not specifically criticize current policy and does not call for

any dramatic change to incorporate his framework. In other words, Higgs avoids an activist tone while the Principles make a point of calling for change.

The Participatory Principle may satisfy Higgs' focal restoration concept that sought to build relationships between communities and nature through the act of restoration. The Principles partially meet this goal by requiring projects to include all stakeholders in planning, assessment, monitoring and evaluation. An additional goal is building consensus among the involved parties. However, Higgs requires that, whenever possible, people in the communities nearest to the site do the physical work in order to build connections with the land. In this aspect the Principles fall short, but that may be a good thing. In some circumstances community members may not be able to participate in highly technical or even dangerous work such as operating heavy equipment or designing detailed stream re-channelization plans. The Principles take this into account and seek to involve people on levels that are practical such as reestablishing vegetation or laying stabilizing mesh along stream banks.

Finally, the Principles integrate Higgs' concept of wild design through the Planning and Adaptive Management Principles. Foremost is the recognition of intentionality. "All restoration projects must be planned and implemented in the context of a restoration assessment... and use appropriate restoration approaches... to restore and enhance ecological integrity" (DellaSala, D. A., et.al, 2003, p. 17). Also, the Adaptive Management Principle provides for continuous community involvement through the monitoring and evaluation criteria. The central goal of this Principle is to allow for restorationists to learn from nature and adjust approaches or designs. This fits nicely with the idea that restoration is not a product with a definable endpoint. A wild designer can

factor this into a restoration plan. Overall the Principles suggest that the intent of restoration is to create and implement a wild design that restores ecological integrity.

In all, the Principles do incorporate many of Higgs' ideas into its framework with the notable exception of historicity and the hands-on experience in focal restoration. Higgs does not address economics in the way the Principles do nor does he specifically advocate for a change in funding mechanisms. It is important to note that the Principles are meant to direct forest restoration therefore it is much more specific in its goals than Higgs' framework.

The History Dilemma

What role should history play in restoration projects? The Principles were written, in part, to challenge federal agencies that use historical records as justification to conduct questionable activities. However, they did not provide clear guidance on how historical information ought to be used. Likewise, Higgs does not tell us the degree of loyalty required regarding historical conditions. The result of these omissions in the policy arena is clear when one examines the Healthy Forest Restoration Act (HFRA). This law references a report by the Forest Service stating, "The term ''condition class 2'', with respect to an area of Federal land, means the condition class description developed by the Forest Service Rocky Mountain Research Station in the general technical report entitled 'Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management' (RMRS–87), dated April 2000 (including any subsequent revision to the report),..." (16 USC 6511(4)). This report was refined and incorporated into the *Interagency Fire Regime Condition Class Guidebook v.1.2*. Since this guidebook provides a model for land managers, its treatment of historical conditions it is worth some review.

The Fire Regime Condition Classes are based on departure from reference conditions. "In order to determine departure and assign fire regime condition class, reference condition characteristics have been identified and descriptions developed... concerning vegetation-fuel class composition, fire frequency, and fire severity for the biophysical settings (BpS's) (formerly potential natural vegetation groups or PNVGs) used in the coarse-scale analysis by Schmidt and others (2002)" (FRCC Guidebook, 2005, 2-2). Regarding those biophysical settings the guidebook explains, "Although biophysical settings represent the collective, integrated attributes of an environment, we use *vegetation* as a proxy to describe them... vegetation is a practical surrogate for the BpS but not a concise classification of vegetation or ecologically-integrated map units" (2005, 2-5.). The guidebook further explains that the biophysical setting for vegetation is broken down into existing, potential and historical definitions, and the "Existing vegetation's departure from that of the reference conditions is used to calculate FRCC" (2005,2-5). "The term *potential natural vegetation* (PNV) refers to vegetation that would become established if all successional sequences were completed and reflects the capability of an area to generate a characteristic set of ecosystem structure, function, and composition" (FRCC Guidebook, 2005, 2-5). Here it is important to note that two schools of thought define inputs into PNV determination where one leaves out climate and the other disturbance. The guidebook does not offer an explanation as to why the two cannot be considered together but it does state that only disturbance based PNV is used in the FRCC methodology (2005, 2-6). However, it is clear that PNV does not inform reference conditions, but rather is used for context: "The concept of potential natural vegetation represents the environmental setting and the landscape's capability to generate the

structure, function, and composition of ecosystems. This potential land capability, associated with an historical range of variation in disturbance, provides information on historical vegetation, which in turn provides a context for determination of the reference conditions used in FRCC assessments" (FRCC Guidebook, 2005, 2-8). This suggests that the determining factor for reference conditions is historical vegetation, which is verified in the guidebook: "For FRCC determinations, we use historical vegetation for reference conditions because we lack understanding regarding the way historical systems would currently operate under present climatic and edaphic conditions" (2005, 2-7). So how does the agency establish reference conditions? The guidebook explains that they "...are determined by experts through synthesis of expert knowledge, published literature, and historical information using standardized computer modeling tools and processes" (2005, 2-8).

This modeling includes a reliance on the historical range of variability (HRV) asserting that ecosystems do not exist in a static environment so reference conditions need to include spatial and temporal ranges rather than on rigid parameters. To illustrate the benefit of this approach, the guidebook compares the HRV to the present natural range of variability (PNRV). Regarding the HRV approach, "Using current and historical data (such as those from tree-ring analysis), modeling can estimate a landscape's range of variation in seral stages (vegetation-fuel classes), fire frequency, and fire severity. A strength of the historical range concept is that a "track record" exists in the form of historical data—albeit to varying degrees, depending on the landscape of interest-- to suggest that landscapes of this time period were, in fact, sustainable" (FRCC Guidebook, v1.2, 2-9). Weaknesses cited are the fact that trees develop over a longer period than the

suggested 400-year pre-settlement timeframe; the assumption that pre-settlement conditions are sustainable in the future; due to increased warming fire regimes cannot be accurately calculated either forward or backward in time; and reference conditions are based on climatic conditions that do not exist (FRCC Guidebook, 2005, 2-10). The present natural range of variation (PNRV) is defined by a time period starting at the present and reaching into the future, with the future endpoint typically defined at 100 to 500 years and sometimes further. "Because vegetation patterns are being modeled according to a climate we will likely experience, the PNRV concept may be more realistic than HRV" (FRCC Guidebook, 2005, 2-9). Weaknesses cited with this approach include, "the inherent speculation on seral stage composition, fire frequency, and fire severity," as well as the uncertainty, "of what will be sustainable in the future (FRCC Guidebook, 2005, 2-10). Also, PNRV requires that restoration goals set forth whether or not to include invasive species and human-caused disturbance (FRCC Guidebook, 2005, 2-11). One interesting point in this comparison is the assumption that the uncertainty associated with the PNRV approach is greater than that of HRV, in essence saying that the future cannot be measured but the past can, which is arguable when one looks at the historical data available, and the models currently in use. In fact the guidebook says as much, "We encourage use of PNRV in applying FRCC because it is realistic, having a basis on current conditions and on trends suggesting conditions to come – not on conditions gone forever (NCSSF 2005). Having said this, use of HRV to determine reference conditions must serve as a surrogate in many cases until better data and models are available (Landres and others 1999)" (2005, 2-11).

While this discussion illustrates how the Forest Service uses history to determine fire regime condition classes, it is relevant to the overall restoration discussion because lawmakers interpret its methodology as an argument asserting future conditions ought to mirror historical references, as evidenced in the HFRA. To this the guidebook warns, "Finally, it should be noted that the range of variation is not the same as the desired future condition...the desired future condition is determined by a statement of policy rather than a scientific principle (2005, 2-12).

The broader question of the appropriate use of history is not easily answered and looking at the Forest Service approach begs the question as to what may be a better way. One response is to ignore historical reference and just use the potential natural range of variability with a desired future condition decided in the public arena. While this may avoid the dilemma of history, it would not be restoration in Higgs' eye because there would be no loyalty to historical conditions and Katz' criticism may ring true; that restorationists are creating artifice.

One solution advanced by Paul L. Hansen, Ph.D., formerly Senior Vice President at Bitterroot Restoration Inc., is to move away from modeling and rely on field data taken from multiple sites (Hansen, P.L., personal communication, December, 29 2005). In this approach, reference conditions are calculated from sampling ecosystems with a high degree of ecological integrity. The focus is not on using proxies, but rather direct measurement of ecological components and functions for that site. Once ten or more sites have been evaluated, then a central tendency can be calculated. The dilemma of history is not a factor according to Mr. Hansen because the areas sampled will have adapted to current conditions over time, therefore the historical reference is included in the data.

Problems of invasive species and human caused degradation are not an issue because areas with high degrees of ecological integrity will not have these issues. Mr. Hansen counters the criticism of global warming invalidating all current data as a purist approach that dismisses the fact that there are large areas of intact ecosystems with high ecological function. At the site-specific level, much data already exists to move forward with developing baselines and reference conditions. Still, the goal of restoration will need to be decided in ecological contexts. For instance, a plan to restore fire to an area may be different than one to restore grizzly populations. However, if it is a question of methodology, using field data over coarse-scale models will always be ideal.

Conclusion

The Restoration Principles and Eric Higgs' framework provide much needed conceptual and practical guidance for restoration projects and policy. Philosophical debates, while important, lose sight of the fact that restoration work is going ahead with or without resolution. The suggested pragmatic perspective is the best approach for engaging restorationists in any ethical dialogue. In light of the current policy direction in forest restoration, calculations from site-specific data are preferable to broad based models that rely on questionable historic references. No matter what the outcome of the philosophical debates on restoration or history, desired future conditions will remain an issue of policy rather than science. The Restoration Principles provides clear forest policy direction if they could be integrated into the current framework. The most pragmatic avenue towards accomplishing this goal is through the Forest Service budgetary process, which the next chapter examines at length.

Chapter Two - Restoration and the Forest Service Budget

As demonstrated in chapter one, how one perceives and defines the term "restoration" is crucial to the implementation of such projects. Laws that shape and guide restoration policy should use the best available science, but not assume that such science can decide the best use of our national forests; that is the job of policy makers. To date, lawmakers have established many and sometimes conflicting purposes for our public lands. The passage of Healthy Forest Restoration Act codified a new direction for the Forest Service, one some call the "restoration century."

However, HFRA was by no means the first law to call for restoring our national forests. The purpose and authority for current policy is guided by a patchwork of legislation and regulation primarily guided by the Organic Act, the Multiple Use and Sustained Yield Act (MUSYA), and the National Forest Management Act (NFMA).

The Organic Act states, "No national forest shall be established, except to improve and protect the forest within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber for the use and necessities of the citizens of the United States." 16 U.S.C. § 475. In the landmark case, *United States v. New Mexico*, 438 U.S. 696 (1978), the Court spoke directly to the purpose of the act when the majority opinion ruled that Congress intended only two purposes when they drafted the legislation: to conserve the water flows and provide a continuous supply of timber. However, the dissenting opinion stated that the wording "to improve and protect" implied an independent third purpose. Though this view was in the minority, one could argue that the Forest Service was mandated, before

its inception, to improve the forest reserves, i.e. restore the forests, especially in watersheds.

Regarding the Multiple Use and Sustained Yield Act, one could also claim that restoration is required to meet all of the activities listed in the statute when it states, "Multiple use means...harmonious and coordinated management of the various resources, and each other, without impairment of the productivity of the land" (16 U.S.C. §531). However, this is not a mandate to restore damaged ecosystems, but rather a directive to make sure public forests provide multiple uses. This is a stark contrast to the "improve" language in the Organic Act. However, the MUSYA does include watershed, wildlife and fish as resources that must be properly managed. This may include an indirect mandate to restore these resources if they become impaired. The NFMA offers the same direction as the MUSYA, in other words, it may indirectly mandate restoration in order to meet its objectives.

However, unlike the MUSYA, the NFMA has language suggesting that Congress intended restoration activities. Specifically, 16 U.S.C. 1602(5)(c) refers to the Renewable Resource Program and states, "The Program shall include, but not be limited to program recommendations which recognize the fundamental need to protect and, where appropriate, improve the quality of soil, water and air resources." This section is part of the amendments to the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), which still plays a significant role in directing the Forest Service by requiring Renewable Resource Assessments. These help shape the purpose and direction of the agency for the next ten years and aid the Chief Forester in developing the Forest Service's Strategic Plan. These assessments provide in part, "a description of Forest

Service programs and responsibilities in research, cooperative programs and management of the National Forest System (NFS), their interrelationships, and the relationship of these programs and responsibilities to public and private activities" (16 U.S.C. 1601(a)(3)). Through RPA assessments and the corresponding Strategic Plan, the agency sets goals that direct spending priorities in conjunction with language in the annual appropriation authorizations passed by Congress. Without detailing the history of the NFMA, the intent of Congress passing the act was to address the unsustainable logging practices of the agency and reinforce the need to follow the MUSYA. To this end section 1604, regarded as the Forest Service's primary guidance, set forth explicit instructions for forest management including the development of Land Management Resource Plans, which are integral for meeting the goals set forth in RPA assessments and MUSYA requirements. Also, section 1604(g)(3) requires the establishment of guidelines for forest plans to ensure plant and animal diversity, as well as the protection of soil and watershed resources. The forest plan sets desired future conditions cited as a purpose and need in Forest Service projects. The combination of the MUSYA, RPA and NFMA forms the Forest Service's core purpose, and the role of restoration in this context is to meet the mandate of these laws.

The recent passage of the Healthy Forests Restoration Act, 16 U.S.C. §6501et seq., and the implementation of the Healthy Forests Initiative (HFI) have framed restoration exclusively in the context of reducing wildfire risk with an emphasis on historic conditions as a baseline. Though there is language that explicitly states, "to protect, restore and enhance ecosystem components," (16 U.S.C. §6501(6)), implementation of these activities is solely through a specific program and limited only to

private lands (16 U.S.C. §6572). Regardless, this legislation does show some Congressional intent for restoration activities. Additionally, through changes to the categorical exclusion (CE) regulation under HFI, the Forest Service is allowed to conduct habitat restoration in post-fire rehabilitation activities without conducting an environmental assessment; instead they can just issue a CE (FSH 1909.15 ch. 31.2).

The National Environmental Policy Act (NEPA) directs the agency to disclose to the public possible impacts that may result from implementing a proposed project. While it is beyond the scope of this paper to detail the provisions required through this act, the obligation to study a project's environmental impacts cannot be understated. The obligatory environmental impact statement is the cornerstone for revealing potential positive and negative results, and explains the project's purpose and need directed by the forest plan. The NEPA needs mentioning here because of its role in directing agency spending. Linking specific appropriations to a project's purpose in the NEPA documents establishes what budget line items fund the environmental review. This chapter will provide further explanation of how this works.

US Forest Service Budget and Appropriations

These statutes provide some context that governs forest restoration policy. How the Forest Service actually accomplishes restoration work is through more traditional sections of those laws in conjunction with many others that authorize and direct agency appropriations; Appendix B, taken from the Forest Service 2006 Budget Justifications, provides a comprehensive listing. However, practically speaking, laws governing commodity production drive much of the actual work and provide funding to accomplish Forest Service goals. The following discussions will explore how the Forest Service

funds restoration, however, this is not meant as an exhaustive explanation of how the agency sells forest products or an examination of the timber sale program. Rather the focus is on the structure of the Forest Service Budget and the appropriations process including project prioritization followed with a discussion of contracting mechanisms.

US Forest Service Budget Formation

In order to understand restoration funding, a basic understanding of the budgetary and appropriations process is helpful. While Congress is the body of government that holds the power to spend money, they do so according to the federal budget. The difference between the budget and appropriations is that the former represents the President's submission to Congress, the latter are the actual amounts passed through the twenty-six appropriation bills. The Forest Service receives its regular appropriations through the Department of the Interior and Related Agencies annual appropriation act (FSH 1909.13, Ch. 31.1). The Forest Service Handbook section 1909.13, titled "Program Development and Budgeting Handbook," describes how the agency sets out its annual budget with exhibit 01, in section six of the zero code, illustrating the process in ten steps.

To start, the Washington D.C. office (WO) creates instructions for budget proposals based on previous levels and the strategic plan established by the Chief, in addition to the policy direction set forth in the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the National Forest Management Act. The Program Budget Instructions (PBIs) "...outlines current, reduced and enhanced levels of funding for various programs. These funding levels are centered around performance-based budgeting" (Weinberg, M., 2000, p. 2). The Government

Performance and Results Act authorizes and directs this requirement. Next, the WO develops program budget alternatives with the input of local units such as forest supervisors or regional foresters. The WO then submits its budget called the Agency Request to the Secretary of Agriculture and at the same time generates the Budget and Justifications Report that details each Forest Service program and its associated cost. Next, the Agriculture Secretary submits the Agency Request to the Office of Management and Budget who can change it at their discretion. The OMB sends back the Agency Request and the Forest Service may appeal any changes. Once it is finalized, the Agency Request is incorporated into the president's budget. At step five, based on the President's Budget, the Program Budget and Development staff issue initial allocations to the field units with the release of the draft Program Budget Management Information (PBMI), often called the Program Budget Advice (PBA), that details specific allocations for each budget line item. Once the Department of the Interior and Related Agencies annual appropriation act is signed into law, the PBMI is updated and finalized.

Step six begins congressional action so the following gives a brief explanation of their process. Law requires that the president's budget be submitted to Congress by the first Monday in February thereby starting the appropriations process. By April 15th, Congress is required to pass their Budget Resolution, which "establishes guidelines and targets for spending and revenue that Congress uses to consider budget and appropriations legislation," (Weinberg, M., 2000, p. 2). Along with House and Senate Budget Committees, other Congressional subcommittees may hold public hearings to further refine the Budget Resolution. Once each branch passes their version of the resolution a conference committee is formed to iron out any differences. With the final

budget resolution established, it moves on to the appropriations process. "The House and Senate Appropriations Committees provide funding for authorized federal programs and agencies, and oversee the use of those funds. Each side has 13 appropriation subcommittees," (Enzer, M., et.al., 1999, p. 1). This is where the spending bills originate that keeps the federal government in operation. Chairs of each subcommittee introduce their respective bill to Congress. Hearings follow and each bill goes for mark-up. Here "subcommittee members work on the bill to make it reflect their priorities. They also draft report language, which accompanies the appropriations bill, explaining priorities and giving directions to federal agencies," (Enzer, M., et.al., 1999, p. 1). The subcommittees then vote to send their finished bill to the full Appropriations Committee and then once voted on it goes to the floor of the House and Senate.

Before and during the congressional hearings, step six in the Forest Service's "Description of the Annual Budget Cycle" applies: "When the President's Budget is received from OMB, the Program Development and Budget Staff prepares work on the Budget Appendix and Explanatory Notes. The Program Development and Budget staff also (a) briefs witnesses for committee hearings; (b) prepares displays for committee hearings; and (c) responds to appropriation subcommittee questions that continue until the appropriations act is signed into law" (FSH, 1909.13 Zero Code, Ch.6). In step seven the allocations to specific program budgets are adjusted per congressional appropriations. Steps eight, nine and ten refer to the mid-year, end of fiscal year and final year reports.

In regard to the Forest Service budget, the entire process takes about two years; for example, the 2007 budget began in January 2005 and is outlined in Table #2-1.

Table 2-1: "Budget Formulation, Presentation and Justification Process."*

One year before submission to Congress	
December-January	Identification of agency priorities begins the budget formulation process.
February-March	The Washington Office issues Program Budget Instructions to the field.
April-July	"Field responses (budget and performance data) are summarized by WO budget staff and provided to the appropriate deputy areas for review and analysis. These are returned to the budget staff for preparation of the current services and agency request levels. The agency's budget is then transmitted to USDA generally by the end of July."
August-November	The USDA submits the Agency Request to the OMB (August/September) and by late November the OMB passes back the initial request.
Year of submission to Congress	
December-January	The WO prepares the Budget and Justifications Report to support the President's budget and the agency submits it to the House and Senate Interior subcommittees on the first Tuesday in February.
February-March	Congressional hearings are held by resource committees and subcommittees including the, "Senate Energy and Natural Resource Committee—Subcommittee on Forest and Public Land Management; House Agriculture Committee—Subcommittee on Forest and Forest Health." During this time, committee members may submit questions for the record that are answered by approved language from the Office of Program and Budget Analysis, the Undersecretary for Natural Resources and the OMB.
March-April	Before mark-up members of both the House and Senate can submit requests to their respective chairs that may include earmarked funds for specific requests. In response the Forest Service produces "capability statements" that explains whether or not the agency can perform the service or project and what the result would be. Capability statements follow the same protocols as answers to committee member questions.
May-September	Appropriation subcommittees vote on the mark-up of the budget requests and send them to the full appropriations committee, which in turn reviews and votes on the mark-up. Then the full House or Senate will vote on the appropriations bill and include any added amendments. Also, conference committee members are appointed at this time to resolve differences between the House and Senate versions. The full Congress will then vote on the conference committee bill and send it to the President for signing.
"During each phase of the mark-up process, based on changes from the President's Budget, we prepare a list of items for which we request 'effects statements' from the various program staffs...The effects statements are offered to inform the subcommittees and committees of the agency's and the administration's perspective on the effects of their actions."	

* All information in this table was provided by an unpublished Forest Service brief generated by the Lolo National Forest (on file with author).

Forest Service Budget Allocation

The next step in understanding how the Forest Service funds restoration involves looking at how actual dollars make it to the local level and how project priorities are decided. "After the appropriations act is signed, the budget data base is updated to reflect funding allocations and performance goals and to the maximum extent possible, decisions

on issues not previously resolved in the initial PBMI" (FSH, 1909.13 Ch. 32.42). The finalized Program Budget Management Information (PMBI) or Program Budget Advice (PBA), guides appropriations and reflects all instructions in the appropriation bill; in essence it is the actual disbursement of funds. The Program Development and Budget staff in the WO enters the final numbers into an accounting database and distributes the necessary forms to the Regional Offices, which in turn apportions funds to individual forests. The budget execution year runs from October 1st to September 30th, and there is some lag between the time the President signs the appropriation bill and when the local forests receive the final PBA.

The Regional Office allocates appropriations to forest supervisors though obligational authority (FSH 1909.13 Ch. 32.5.2). "This term is often used synonymously with apportionment authority and includes authority to obligate funds from all sources, including new budget authority, unobligated balances from prior years, reimbursements and other income" (FSH 1909.13 Ch. 30.5). As stated, the PBA assigns targets and/or objectives for each budget line item, though the political reality is that only board feet for timber and acres for wildfire treatment are "hard" targets. The leeway afforded forest leaders to prioritize projects to meet those targets and objectives is called "decision space."

Decision space is the will or ability to prioritize specific projects, and may be influenced by many factors. For example, if the PBA appropriates funding for twenty miles of road decommissioning, the Forest Leadership Teams (FLTs) meet to decide where and what quantity of the work will be accomplished. Additional appropriations during the budget execution year are one variable taken into account. In order to

understand how this works, one needs an explanation of the different kinds of funds. First, there are discretionary and mandatory appropriations where the latter is created by legislation and automatically funded every year, and the former are programs that need yearly Congressional approval. Only these discretionary funds are available for adjustments when developing work chunks (explained below). Also, funds are classified as annual, multi-year and no-year, the last usually referring to appropriations available for an indefinite time (FSH 1909.13 Ch. 30.5); most of the Forest Service budget is in no-year funds. Nine categories exist for classifying funding sources and are listed in Table #2-2 with brief explanations. Decision space may take into account the availability of these funds, the most common of which are carryovers from the previous year. These funds are sent back to the WO at the end of the fiscal year and stay within the budget line item (BLIs) for which they were assigned. The WO then may decide to send back those funds with new targets, but this occurs after final allocations, so the funds are generally disbursed after the first quarter. Sometimes, reallocations of carryovers are known ahead of time for a particular project or objective and the forest supervisor can factor this into account. Decision space also works as a tool where forest leaders can decide to find dollars for specific BLIs through appropriation transfers. As shown in Table #2-2, these funds essentially come from trading amounts from one BLI to another between different National Forests. For example, the Lolo National Forest could trade $90,000 from their BLI used to manage forest products with the Flathead National Forest's BLI used to manage watersheds. The forest supervisors can authorize the trade of dollars and its associated targets if there is sufficient will to do so. Whether anticipating additional funding, trading dollars between BLIs, or prioritizing projects within the assigned

appropriations, decision space is a tool forest leaders can use if there is sufficient motivation to prioritize one project or goal above others. This could come from internal pressure by key individuals during planning meetings who champion a certain project or BLI. It may also come from external pressure from interest groups who want to see more restoration work accomplished. No matter the source, decision space is essential during the prioritization process.

Table 2-2: "Descriptions of Forest Service Funding Sources" (FSH 1909.13 Ch.31.1 - 31.9).

Source Title	*Source Explanation*
Appropriations	These are discretionary and mandatory funds provided by law.
Continuing Resolutions	If Congress fails to pass the appropriation bills by October 1st then, a resolution is needed to keep the federal government operating.
Supplemental Appropriation	Usually one-time money authorized for a specific purpose and often incorporated into the regular budgeting process.
Reimbursements	Money collected for products sold or services provided, and include court ordered payments.
Recoveries	These funds are available to no-year and open multi-year accounts originating from unspent funds previously allocated.
Allocation Accounts	"The amount of obligational authority delegated from one agency, bureau, or account to another and set aside in a transfer appropriation account (also known as an allocation account) to carry out the purposes of the parent appropriation or fund account." (FSH 1909.13 Ch. 31.7)
Appropriation Transfers	"...funds are made available under specific legislative authority that actually results in the transfer of obligation authority and cash from one appropriation account to another for the benefit of the receiving appropriation" (FSH 1909.13 Ch. 31.7)
Refunds	Funds recovered from excess or incorrect payments.
Carryover Funds	Funds brought over from the previous fiscal year.

The Lolo National Forest develops spending priorities by creating "work chunks." These are specific activities that have a priority number with a corresponding fund-code, i.e. BLI, which in turn matches a measurable result. All national forests have some version of this process, and the Lolo National Forest employs the "work chunk" method as part of its effort to use performance budgeting where project results tie into program objectives, which in turn help inform future funding levels. "The work chunk process creates a forest-level program of work. In the process, discrete pieces of work are

defined with outputs and costs, then prioritized by fund code under an overall set of FLT priorities or criteria." (Wickersham, 2003). The FLT meets in January to determine next year's priorities, based on funding levels and targets in the PBA as well as ongoing work. Specific working groups meet at the forest level by fund code with a proposed set of activities generated before hand in consultation with local staff. The work chunks are then sent to specialists for review and comment. Next comes the Line Officer Review, which "involves face-to-face meetings between the FLT and the Lolo Forest Supervisor for each fund code. The objective is to review, modify, and approve the program of work as developed and prioritized by the functional groups." (Wickersham, 2003). Finally, the FLT reviews the work chunks for the forest and can re-prioritize them if needed. It is important to note that performance budgeting uses fund-codes to track results so accountability ties directly to staying within funding levels for a specific code. In other words, "There is NO project level tracking option so managers are ONLY accountable to the fund level" (unpublished presentation, Lolo NF). For example, District and Forest staff officers and specialists who work closely on projects that use the Vegetation and Watershed BLI will meet in workgroups to review proposed budget allocations for the next fiscal year and determine where those estimated allocations can best be spent to meet targets based on the Lolo National Forest priorities. Looking at the 2006 Region One PBA, the Lolo National Forest has 236,800 dollars to work on improving 96 acres of watersheds. The program specialists and staff officers will discuss where to best spend those dollars and which projects to prioritize based on the PBA anticipated targets and the forest and regional priorities. The result is a work chunk that has a priority number within that particular BLI with a measurable outcome and cost. After the workgroup meets they

will send their work chunks to specialists, such as a fisheries biologist, to get feedback for possible re-prioritization and updated cost estimates if needed. Afterwards, the Forest Budget Officer compiles all the BLI's in the work chunks and brings them to the FLT meetings where they decide an integrated program of work resulting in the approval of the work chunks.

Table 2-3: "The FY 2006 President's Budget request for the Forest Service."

(Dollars in Millions)

Appropriation Title	FY 2005 Enacted	Pay Costs	Program Changes	FY 2006 Budget
Forest and Rangeland Research	276.4	4.7	4.3	285.4
State and Private Forestry	292.5	1.7	-40.8	253.4
National Forest System	1,380.8	29.2	241.3	1,651.3
Wildland Fire Management	1,703.0	18.5	-277.2	1,444.3
Capital Improvements and Maintenance	514.7	6.6	-140.5	380.8
Land Acquisition	62.3	.3	-21.3	41.3
Other Appropriations	8.9	.1	.5	8.5
Total Discretionary Appropriations	**4,238.6**	**61.1**	**-234.7**	**4,065.0**
Total Mandatory Appropriations	770.6	4.5	36.1	811.2
Subtotal Total, Forest Service	**5,009.2**	**65.6**	**-177.0**	**4,876.2**
Supplemental and Other emergency funding	537.5	0	-537.5	0
Grand Total, Forest Service	**5,546.2**	**65.6**	**-736.1**	**4,876.2**

Table found in the USDA Forest Service Overview of FY 2006 President's Budget, page 1.

The Forest Service Budget Structure

Now that an explanation of the budget process and how the agency establishes priorities has been provided, an understanding of the specific budget line items is necessary to illustrate how the Forest Service funds restoration. As stated above, Forest Service budget line items are divided into discretionary and mandatory appropriations, with the latter containing four trust funds and eighteen permanent appropriations funded by retained receipts. (Forest Service 2006 Budget Overview, 2005, p. 15). Seven main categories comprise discretionary funding and Table #2-3 illustrates funding levels for each appropriation title. The Budget Justifications for fiscal year 2006 describes each

program and Table #2-4 lists the title and BLI where there is mention of restoration work or research. It is important to note that programs on this list only need to have mentioned restoration as one of its goals and may not meet the standards outlined within the Restoration Principles or definitions set by Higgs. Some items relating to land acquisitions were also included. The following section looks at the more common BLIs that fund restoration work.

Table 2- 4: "Forest Service Budget Categories Relating to Restoration."

Appropriation Title	Program or Budget Line Item/Expanded BLI
Forest and Rangeland Research	Conduct Research/Forest Inventory & Analysis
State and Private Forestry	Forest Health Management/Federal Lands
State and Private Forestry	Forest Health Management/Cooperative Lands
State and Private Forestry	Cooperative Forestry/ Forest Stewardship Program
State and Private Forestry	Cooperative Forestry/ Forest Legacy Program +
State and Private Forestry	Cooperative Forestry/Economic Action Program*
National Forest System	Inventory and Monitoring
National Forest System	Wildlife and Fisheries Habitat Management
National Forest System	Grazing Management
National Forest System	Forest Products
National Forest System	Vegetation and Watershed Management
National Forest System	Minerals and Geology/ECAP and AML
National Forest System	Landowner Management +
National Forest System	Hazardous Fuels
Wildland Fire Management	Fire Operations-Other/Rehabilitation**
Wildland Fire Management	Fire Operations-Other/Fire Research and Development
Capital Improvement and Maintenance	Roads
Capital Improvement and Maintenance	Deferred Maintenance and Infrastructure Improvement
Land Acquisition	Acquisition of Lands to Complete Land Exchanges +
Permanent Appropriations	Payment to States
Permanent Appropriations	Restoration of National Forest Lands and Improvements
Permanent Appropriations	Roads and Trails (10 Percent) Fund
Permanent Appropriations	Stewardship Contracting
Permanent Appropriations	Timber Salvage Sales
Trust Funds	Cooperative Work Trust Fund -Knutson-Vandenberg (K-V) Fund
Trust Funds	Reforestation Trust Fund

* - This Program was defunded.
+ - These line items are not restoration specific but fund transactions to acquire lands not in federal ownership.
**- "Rehabilitation and restoration projects are funded with National Fire Plan and other appropriated dollars." (FY 2006 Budget Justifications, 8-17)

Though restoration is not specifically mentioned, the Inventory and Monitoring BLI under the National Forest System title provides funding for ecosystem evaluations.

Specifically, "Assessments evaluate current and desired resource conditions at or above the watershed scale and improve the knowledge base of the agency for subsequent decision-making at the forest plan and project levels" (Forest Service 2006 Budget Justifications, 2005, 7-2). Often these assessments identify areas that need improvement and help shape the purpose and need for NEPA evaluations. Watershed and broad-scale level assessments as well as GIS core mapping, forest plan monitoring, and integrated inventories all have a specific appropriation for a particular forest. For example, the Lolo NF in 2005, with full funding expected, allocated $400,000 for three watershed assessments and $300,000 for two broad-scale assessments (USDA Forest Service Lolo NF, 2006, p.17).

The Wildlife and Fisheries Management BLI directly funds many restoration activities. "This includes actions to restore, recover, and maintain habitat and ecosystem conditions necessary for healthy populations of fish and wildlife" (Forest Service 2006 Budget Justifications, 2005, 7-35). While the focus commonly is on recovering threatened and endangered species through habitat improvements, this fund may help accomplish specific work activities on a number of projects. "Depending on the species and habitat prescriptions, project work may include prescribed burning, development of water sources in arid habitats, restoring degraded riparian habitats, stabilizing stream banks, and reducing stream sedimentation" (Budget Justifications, 2006, 7-38).

The Forest Service uses its Forest Products BLI under the National Forest System appropriation to accomplish many of its restoration goals while implementing the timber sale program: the fund-code is National Forest Timber Management or NFTM. The agency claims that "timber sales provide the means to accomplish changes in forest

structure that can improve wildlife habitat conditions for species such as deer and elk, and also help accomplish large-scale watershed restoration needs by reducing accumulated ground and ladder fuels that pose an unacceptable risk of high intensity wildfire" (Forest Service 2006 Budget Justifications, 2005, 7-4). Such claims of ecological benefits from timber harvests are one of the root causes of contention between different interests. Later this chapter will look more closely at how this BLI funds restoration work.

The Vegetative and Watershed Management (NFVW) BLI funds most common restoration work. The 2006 Budget Justifications explains, "Vegetation and watershed management of our national forests and grasslands is a fundamental agency responsibility, focusing on the restoration, enhancement, and maintenance of watershed conditions including soil, water, air, and forest and rangeland vegetation" (2005, p. 7-50). Activities funded with this BLI include reforestation and timber stand improvement treatments, which are components of the timber sale program. Whether or not this is necessary for restoring ecological integrity is another point of contention among different interests, but the Forest Service cites improving habitat, restoring soils as well as controlling noxious weeds as examples of the program's ecological benefits. The NFVW uses five expanded line budget items (EBLIs) to fund specific activities: Maintain and Improve Watershed Conditions, Improve Rangeland Vegetation, Improve Forestland Vegetation, Treat Noxious Weeds, and Manage Air Quality. The most commonly used funds come from the Improve Forestland Vegetation and the Maintain and Improve Watershed Conditions EBLIs.

The Minerals and Geology BLI under the National Forest System appropriation funds the Manage ECAP/AML EBLI: "The Environmental Compliance and Protection (ECAP) program provides for the cleanup of hazardous substances on national forest lands to improve and protect watershed conditions and human and ecological health. The Abandoned Mine Land (AML) program focuses specifically on cleaning up abandoned mines in high priority watersheds" (Forest Service 2006 Budget Justifications, 2005, 8-48).

The Hazardous Fuels BLI under National Forest System appropriation focuses not only on reducing threats to communities from wildfires, but also on restoring fire adapted ecosystems. "The desired outcome of the hazardous fuel program as stated in the 10 Year Comprehensive Strategy, is to reduce the risk of unplanned and unwanted wildland fire to communities and to the environment" (Forest Service 2006 Budget Justifications, 2005, 7-75). In 2005 the Hazardous Fuels budget was moved from Wildland Fire Management to the National Forest System in order "to enhance integration of hazardous fuel treatments with other vegetative treatment programs..." (Forest Service 2006 Budget Justifications, 2005, 8-16). This program rests on the research establishing Fire Regime Condition Classes discussed in chapter one. As mentioned, this is highly controversial due to modeling design and even more, the use of history to justify timber sales designed to meet restoration goals. The program divides funds between two EBLIs: Non Wildland-Urban Interface and Wildland-Urban Interface Hazardous Fuel Projects. On the Lolo NF over 3.3 million dollars was allocated in 2005 to this program with $536,000 going towards non-urban fuels treatments (USDA Forest Service, Lolo NF FY 2005 Budget Proposal by Program and Activity, 2006, p.13).

Wildland Fire Management is a significant appropriation with activities focusing on restoring fire adapted ecosystems and burned areas. Under the Fire Operations-Other appropriation is the Fire Research and Development program. The funding for related activities are actually transferred to the Forest and Rangeland Research account, but listed under this appropriation because it specifically supports wildland fire studies and outputs. The associated research station was responsible for establishing the fire condition regime classifications. The Rehabilitation EBLI focuses on restoring burned areas with projects lasting no more than three years. "The goal of the program is to rehabilitate and restore burned areas that are unlikely to recover naturally from the effects of wildfire [and] provides for comprehensive restoration efforts that work to restore overall watershed conditions" (Forest Service 2006 Budget Justifications, 2005, 8-17).

One of the most daunting issues regarding restoration on Forest Service lands deals with the problem of the deteriorating road system. The Capital Improvement and Maintenance appropriation contains the Roads EBLI, which funds road construction or reconstruction for timber sales, transportation planning, maintenance, management and road decommissioning. "Decommissioning of roads is not an allowable use of appropriations under the authorizing statute. However, since FY 1991, language in annual appropriations bills has authorized use of a portion of appropriated Roads funds for decommissioning (up to $15 million in FY 2005)" (Budget Justifications, 2006, 9-16). Over the years much of the road maintenance was not completed leading to a current backlog of much needed work, which is why many of the roads are contributing to degraded ecosystems. The Forest Service dedicates an entire EBLI, the Deferred Maintenance and Infrastructure Improvement, to deal with the problem. The program

seeks reduce the backlog of work and "meet laws, regulations, codes, best management practices, and other applicable standards. It can also include demolition, dismantling, and disposing of unneeded infrastructure" (Forest Service 2006 Budget Justifications, 2005, 9-24). Possible restoration activities include culvert replacement and upgrades, in addition to road obliteration or long-term storage.

All of the program descriptions so far come from discretionary appropriations, those funded year to year through the budget process and subject to manipulations during prioritization. The other type of funding comes from mandatory appropriations required by specific law and cannot be changed by Forest Service personnel. The following sections look at programs that may fund restoration work: Payment to States, Road and Trail (10 Percent) Fund, Stewardship Contracting, Timber Salvage Sales, Knutson-Vandenberg (K-V) Fund and the Reforestation Trust Fund.

The Secure Rural Schools and Community Self-Determination Act of 2000 (P.L. 106-393) was passed to address the declining payments to states from the timber sale program. The Twenty-Five Percent Fund Act of May 23, 1908 directed that amount as payment to counties where timber sales were located. The new law allows counties to keep the old twenty-five percent determinations or receive a set amount of funding based on timber receipts from the three highest return years between 1986-1999. "If a county elects to receive its share of the full payment amount and receives over $100,000, it must set aside 15-20 percent for forest restoration, maintenance, or stewardship projects (Title II), or for county projects (Title III), or it must return those set-aside funds to the Treasury" (Forest Service 2006 Budget Justifications, 2005, 12-19). Resource Advisory Committees (RACs) direct the expenditure of Title II or III funds and members must

come from all interested stakeholders. Full funding for restoration projects are not common under this provision, but they may help provide assistance in conjunction with Stewardship Contracts.

The Act of March 4, 1913 (16 U.S.C. 501), called the Road and Trail (10 Percent) Fund, historically mandated that "10 percent of national forest receipts are made available to build and maintain roads and trails within national forests in the States where the receipts were collected" (Budget Justifications, 2006, 12-23). In 1999, under the Omnibus Appropriations Act (P.L. 105-277, General Provision 332), Congress expanded the use of these funds to include restoration of watersheds and other beneficial projects.

Section 347 of the 1999 Omnibus Consolidated and Emergency Supplemental Appropriations Act (P.L. 105-277) created the Stewardship Pilot Program where a limited number of projects could essentially trade timber for specific services in the project area. Section 323 of the Consolidated Appropriations Resolution Fiscal Year 2003 (P.L. 108-7) expanded this authority to an unlimited amount of projects and lasts till September 2013. Any excess receipts not spent in the project area or authorized by the Regional Forester for another stewardship project are placed in this BLI for future use. "Funds can be used for a wide range of ecosystem restorative work, such as watershed restoration and maintenance, road obliteration for sediment control, wildlife habitat improvements, fuel load reductions, timber stand improvements, and insect/disease protection" (Forest Service 2006 Budget Justifications, 2005, 12-24). Later this paper offers a more detailed description of stewardship contracting.

Though not considered part of ecological restoration by many proponents of the Principles, the Forest Service uses Timber Salvage Sales to fund some projects with

ecological benefits. "The National Forest Management Act of 1976 (16 U.S.C. 472a(h)) authorizes the Secretary of Agriculture to require purchasers of salvage timber to make monetary deposits, as a part of the timber payment, to cover the cost for design, engineering, and supervision of the construction of needed roads and the cost for Forest Service sale preparation and supervision of the harvesting of salvage timber" The Forest Service claims that salvage logging provides much needed restoration, a point debated by many environmentalists. Without delving into the particulars of this argument, practically, this fund provides support for project planning and implementation where legitimate restoration activities may take place. Chapter three provides an example of how this works.

The Knutson-Vandenberg (K-V) Fund, authorized by the Act of June 6, 1930 (16 U.S.C. 576-576(b)), established a trust fund to hold deposits made by timber purchasers to reforest timber sale areas. Specifically the act required planting, sowing tree seeds and conducting timber stand improvements. The National Forest Management Act of 1976 amended the act to expand the use of these deposits to include, "protecting and improving the future productivity of the renewable resources of the forest land on such sale area, including sale area improvement operations, maintenance and construction, reforestation and wildlife habitat management" (16 U.S.C. 1604(a)). Just this year Congress added another amendment in the Department of the Interior, Environment, and Related Agencies Appropriations Act of 2006 by adding language to include, "watershed restoration, wildlife habitat improvement, control of insects, disease and noxious weeds, community protection activities, and the maintenance of forest roads, within the Forest Service region in which the timber sale occurred" (20 USC 959(a) sec. 412). The 2006

Budget Justifications explains that these deposits are, "intended to: 1) reforest timber sale areas; 2) use timber stand improvement practices to enhance stand productivity, promote the restoration, maintenance, or improvement of a variety of forestland ecological conditions, and maintain biological diversity; and 3) protect and improve all other resource values on timber sale areas, including wildlife, soil, watershed, range, and recreation" (2005 p. 13-2). Later this chapter will explain how K-V deposits accomplish these goals through sale area improvement plans.

The Recreational Boating Safety and Facilities established the Reforestation Trust Act of 1980 (P.L. 96-451, Title III, as amended). This fund acts in a similar way to the Deferred Maintenance BLI in that it serves to address the backlog of work, in this case tree planting that did not get done through K-V deposits. In addition, it also "serves to promote the restoration, maintenance, or improvement of forest stands under a variety of forestland ecological conditions and to maintain biological diversity. The fund also is used in conjunction with other vegetation management funds to provide an integrated, effective means of treating forests in need of forest health restoration" (Budget Justifications, 2006, 13-9).

Contracts

As mentioned, the NFIM BLI provides funding for assessments land mangers use to identify areas in need of work to move the forest towards more desirable conditions as identified in their respective forest plans. The chosen area then goes through environmental analysis mandated by the National Environmental Policy Act (NEPA). In 2004, the agency changed its procedure regarding how many BLIs may fund this analysis (Bosworth, D., 2004). Before, the primary purpose of any project would fund the NEPA

work, so in order for NFTM to pay for the environmental study the main purpose and need of the project would have to be timber production, which could only happen on lands determined as suitable in the Forest Plan. Now, however, up to five BLIs may fund the analysis. So if the primary purpose is not timber production, NFTM can still pay for a portion of the NEPA work. After the NEPA review and subsequent authorization by the District Ranger, funding for actual work activities may come from different BLIs determined by the type of work involved. Keep in mind, the NEPA analysis area may need several different projects to accomplish the purpose and need.

Once the district ranger signs a decision memo or notice, project implementation may begin. While agency personnel can do some of the work, most often contracts with private companies provide the mechanism to accomplish project goals. Timber sales do not pay for restoration in traditional timber contracts, rather they function as a means to authorize and fund such work through K-V deposits. As mentioned, the Knutson-Vandenberg Act (16 U.S.C. 576-576b; 46 Stat. 527), as amended by the NFMA (16 U.S.C. 1604(a)), as amended by P.L. 109-54 Sec. 412, "is the authority for requiring purchasers of National Forest timber to make deposits to finance sale area improvement activities needed to protect and improve the future productivity of the renewable resources of forest lands on timber sale areas" (FSH 2409.19, Zero Code, 01). In order to use K-V deposits, timber sale administrators develop sale area improvement plans (SAIs), which every timber sale must have. These plans detail post harvest mitigation, protections or improvements identified through the NEPA analysis (FSH 2409.19 Ch.11). The only work required by the K-V act is reforestation; all other activities are allowable uses of K-V deposits. If deposit amounts do not cover the secondary work, then the line

officer prioritizes the activities and finds appropriated dollars from other BLIs to make up the difference. For example, the Forest Service Handbook states, "Supplement available K-V funds with appropriated watershed improvement funds, as necessary, to achieve stable, productive watershed conditions in adjacent areas that directly influence success of sale area improvements" (2409.19 Ch. 11.25). The handbook provides a list of appropriate uses of K-V funds and in this manner timber sales may accomplish restoration work within the sale area. As one might guess, the mechanics of timber sale contracts involve much more than discussed here. However, this brief explanation outlines how timber dollars may fund restoration and how the timber sale program ties into accomplishing such work.

Often times timber contracts will not provide the means to accomplish project goals. In these cases the agency will simply hire a company to do the work. Administration through procurement regulations found in the Federal Acquisition Regulations (FAR) guide these service contracts. Limitations often cited relate to the inability of the contract officer to include timber removal. A different set of rules and regulations apply to the sale of goods, which service contracting does not allow. A new mechanism developed to address this barrier is stewardship contracting.

Stewardship Contracting

In December 2005 the Forest Service updated their handbook directing stewardship contracting in response to its reauthorization under section 347 of the Omnibus Consolidated Appropriations Act of Fiscal Year 1999 as amended by section 323 of P.L. 108-7, 2003. Since its passage, stewardship contracting continues to play an increasing role in implementing restoration projects. This section will outline the basic

provisions of the law and detail the different contracting mechanisms authorized in the rules and regulations.

The authorizing legislation clearly states when stewardship contracts may be used, hiring criteria for contractors, the length of contracts, the valuation of products or services, how to direct receipts and costs, and provisions for monitoring, evaluation and reporting. Specifically, the law states that its overall purpose is "...to perform services to achieve land management goals for the national forests and the public lands that meet local and rural community needs" (16 USC 2104 Note(a)). Section (b) lists seven specific goals:

> (1) road and trail maintenance or obliteration to restore or maintain water quality;
> (2) soil productivity, habitat for wildlife and fisheries, or other resource values;
> (3) setting of prescribed fires to improve the composition, structure, condition and health of stands or improve wildlife habitat;
> (4) removing vegetation or other activities to promote healthy forests, reduce fire hazards, or achieve other land management objectives;
> (5) watershed restoration and maintenance;
> (6) restoration and maintenance of wildlife and fish habitat; and
> (7) control of noxious weeds and exotic weeds, and re-establishment of native plant species.

16 USC 2104 Note(b)(1-7).

To further clarify its purpose the Forest Service states, "The intent of stewardship contracting is to accomplish resource management with a focus on restoration" (FSH 2409.19 Ch. 60.3). With such an emphasis, the debate surrounding what qualifies as legitimate restoration becomes even more crucial. While the agency offers some examples of what does and does not qualify, they offer no clear definition of restoration.

One main departure from traditional Forest Service contracts is the requirement that agency personnel use "best value" determinations. Before, contract officers had to accept the lowest bid from applicants for both service work and timber sales. With

stewardship contracts, "evaluation factors may include, but are not limited to, past performance, work quality, experience, and benefits to the local community" (FHS 2409.19 Ch. 60.5). Also, contracts may be multi year providing set outcomes over the long term and thereby offering incentives for investment into equipment and training; a contract may last up to ten years.

A key feature in stewardship contracting is the requirement for collaboration detailed in the Forest Service Handbook: "While the enabling legislation does not specifically mention collaboration in stewardship contracts, the Secretaries of Interior and Agriculture have directed the Forest Service and the Bureau of Land Management to involve States, counties, local communities, and interested stakeholders in a public process to provide input on implementation of stewardship contracting projects" (FSH 2409.19 Ch. 61.12). It is useful to note that while the Forest Service may initiate a collaborative process, agency personnel need to follow the mandates of the Federal Advisory Committee Act therefore they cannot go beyond an advisory role during meetings. Also, stewardship collaboratives may be initiated by anyone; they can recommend specific contract requirements within the law, and carry out post project monitoring. The important factor to remember is that collaboration is a requirement and "...is typically expected to go beyond the public involvement requirements of NEPA analysis" (FSH 2409.19 Ch. 61.12a).

Another feature of the stewardship authority relates to offsets. "...the Forest Service may apply the value of timber or other forest products removed as an offset against the cost of services received" (16 USC 2104 Note(c)(3)(A)); this is commonly called "goods for services." The overall worth of any contract is the sum of products

removed and the value of service received. Here the difference between the sale of goods and the procurement of services is key because of the separate methods for appraisal. Regarding the value of products, the Forest Service contract officer uses Timber Sale Preparation Handbook to appraise its value, while appraisal of services uses guidelines from the Federal Acquisition Regulations (FAR). The contract officer is responsible for determining stewardship credits defined as, "credits earned by a contractor under a stewardship contract in the exchange of goods for services when services are performed. The credits are traded based on the value of product removed" (FAR, 4G37.715(a)). Using the appraised value of products and services, the contract officer tracks the exchange of goods for services.

This brings up another feature of stewardship authority: residual and retained receipts. The difference between the value of timber and services determines the residual receipt. Once any required costs are deducted, what are left are retained receipts, and if approved by the Regional Forester, these can be used for another stewardship contract, or used to support the collaborative process. They may also be used for project or program monitoring.

The stewardship law states, "The Forest Service may enter into agreements or contracts under subsection (a), notwithstanding (d) and (g) of section 14 of the National Forest Management Act of 1976..." (16 USC 2104 Note (c)(4)). The exemptions apply to specific sale advertisement conditions and the requirement that only agency personnel mark trees. The latter is a significant change because it removes the mandate that all cut trees need to be marked. The Forest Service Handbook lists two methods for tree harvest; one is Designation by Description (DxD), the other is Designation by Prescription (DxP).

"DxD should be used only when it is the most efficient method of designation and when several individuals applying the description on the ground would arrive at the same end result. The trees to be cut, or left, are designated according to the description and not left to the discretion of the contractor" (FSH 2409.19 Ch. 61.3.1). An example would be the requirement that all Douglas fir under 12 inches diameter be removed or that crown spacing be 20 feet making sure to retain all the larch trees. In other words, anyone can go out and apply the contract requirements and end up with the same results. "Designation by prescription (DxP) may be used for noncommercial material or for low value commercial material when, for payment purposes, the quantity of products removed can be determined post harvest" (FSH 2409.19 Ch. 61.3). Here the contractor decides which trees to leave or cut. An example would be meeting a specific basal area target or applying contract obligations without tree marking.

One key decision in applying stewardship projects is determining which type of contract to use, five options are available: integrated resource (IR) timber or service contract-scaled, IR timber or service contract-tree measurement, and service contracts: appendix C shows the decision matrix used by the agency. The main difference between scaled and measured relates to timber appraisals where they are set at "75% of the total product value at appraised rates if products will be scaled, and approximately 90% of the total if products will be paid for on a tree measurement or lump sum basis" (FSH 2409.19 Ch. 62.1). The IR timber contracts are available when the timber value exceeds the service value, and procurement officers use IR service contracts when the timber value does not exceed the service value. Stewardship service contracts "cannot trade goods for services, but can use receipts from an approved stewardship contracting project to pay for

service work or use appropriated dollars" (FSH 2409.19 Ch. 62.13). One purpose of stewardship contracting is to get as much work done under one agreement. "The number and types of work activities bundled inside a stewardship contract can affect the contract type selected for the project, the economics of the project, the number of potential contractors, and the benefits to local and rural communities" (FSH 2409.19 Ch 62.2). The handbook lists set criteria to consider when bundling work activities: "Accomplish restoration objectives in the most efficient and cost effective manner; Result in the least impact on the resources; Benefit local and rural communities; Utilize local workforce to the extent practical; Provide training opportunities to increase number of contractors and/or number of workers; Provide products that can be used economically in local, regional and national markets" (FSH 2409.19 Ch 62.2).

Stewardship contracting allows for different parties to reach formal agreements with the Forest Service. "Agreements are not typically entered into through a competitive process, rather they are based upon an application and proposal presented to the agency to meet mutual objectives (as is the case with stewardship contracting agreements) and land management goals" (FSH 2409.19 Ch 64). These must still adhere to the rules of stewardship contracting, with some changes to best value determinations. These include consideration for how much the agreement meets the mutual interest of all parties, the presence of mixed ownership, outside funding sources and expertise (FSH 2409.19 Ch 64.1). Agreements encourage joint participation between all stakeholders and may work well with the collaboration requirements.

Another important aspect of stewardship contracting relates to wage issues. "Local prevailing wage rates or woods rates are used when estimating costs on both the

product removal and procurement sides of the contract. Davis-Bacon wage rates do not apply for specified road construction and reconstruction performed by a contractor. However, if a contractor decides to have the Forest Service construct a specific road (turn back road) through a public works contract, Davis-Bacon wage rates apply to the public works contract. Service Contract Act (SCA) wage rates do not apply to product removal or to the procurement sides of the contract" (FSH 2409.19 Ch. 65.12d). What this means is that service contracts greater than $2,500, wages and benefits determined by the local Department of Labor apply or in the absence of such information, the minimum wage. If the project requires road construction through the Forest Service then it becomes subject to the Davis-Bacon Act, which requires contractors to pay prevailing wages, determined by the Department of Labor, for contracts valued at $2,000 or more (40 U.S.C. 3141 *et seq*). These wage determinations were meant to guarantee workers receive decent pay.

Finally, stewardship contracts require some level of monitoring. Initially, the pilot program mandated the agency to conduct project level inspections. This changed under the new ten-year authority to multi-party programmatic monitoring. "The focus of multi-party monitoring in accordance with the 10-year stewardship contracting authority (16 U.S.C. 2104 Note) is programmatic monitoring of collaboration and the role local communities in stewardship contracting" (FSH 2104.19 Ch. 68.1). This requires only a sampling of projects from around the nation, and may use retained receipt to pay for collection and reporting. However, multi-party monitoring at the project level may still occur if requested by the collaborative group. Here retained receipts may pay for "facilitation, meeting rooms, travel, incidental expenses, data collection, and dissemination of monitoring findings to the public" (2104.19 Ch. 67.2c).

Conclusion

Tracking restoration work from congressional appropriations to project implementation is a challenge due to the Forest Service's structure and reporting system. The decision by forest team leaders to accomplish restoration work is limited by the Program Budget Advice, directions set by the Chief, and Regional and Forest level priorities. For example, while an individual national forest may wish to decommission more roads, the Regional Office and the Chief Forester must support these efforts. In turn, there needs to be sufficient funds allocated in the Program Budget Advice to carry out this goal. Without all of these factors aligning, the potential results are less decommissioned roads. However, individual national forests may still find ways to accomplish restoration goals through their prioritization process and creative funding alternatives. In addition to trading dollars and targets between budget line items among different forests or relying on carryovers, different types of contracts offer more options. The expanded use of K-V funds allows for other BLIs to fund restoration work when the collected deposits are insufficient to cover the costs. Also, stewardship contracting seeks to combine the sale of goods and the procurement of services with specific emphasis on restoration. The drawback to both of these is their dependence on the sale of timber to fund the restoration work. The next chapter will examine the Knox-Brooks Timber Sale and Road Rehabilitation stewardship project, illustrating how it was funded and where those dollars were spent. Afterwards a discussion will follow comparing the project with the Restoration Principles. Not only will this highlight the how the work was funded but also if it can be considered good restoration.

Chapter Three – Knox Brooks Funding and the Restoration Principles

The last chapter demonstrated how the Forest Service formulates, structures and administers its budget. Many different Budget Line Items (BLIs) may contribute to project implementation and stewardship contracting is a new tool that can integrate both service and timber contracts. The Knox-Brooks Timber Sale and Road Rehabilitation project was one the first stewardship projects under the pilot authority allowing the trade of wood products for restoration services. Though the new stewardship law changed some of the language in the pilot authority, this does not affect how the project was funded. This chapter will illustrate how BLIs match up with actual work accomplished and demonstrate the "goods for services" component. The last section will compare the Restoration Principles and the Knox-Brooks Stewardship project.

Knox-Brooks Timber Sale and Road Rehabilitation Project Description

The environmental impact statement detailed the analysis of 29,300 acres near DeBorgia, Montana with the St. Regis River marking the southern boundary and the Cabin Creek Divide the northern boundary (FEIS, S-1). "The area is dominated by productive forests consisting primarily of subalpine fir and spruce in the cool and moist environments, mixed conifer stands of Douglas-fir, larch, and other tree species in the warmer and drier environments, and large scattered stands of lodgepole pine (ROD-2)." The 1910 fires primarily established stand composition and the lodgepole in the analysis area had reached climax conditions making many of the trees susceptible to mountain pine beetles and stand replacing fires. The EIS stated that the project's purpose and need was based on current forest conditions and its departure from desired future conditions; the latter based on the 1986 Lolo National Forest Plan. Current conditions were measured

in a 79,000 acre landscape analysis carried out according to the guidelines set forth in the Ecosystem Analysis at the Watershed Scale Federal Guide for Watershed Analysis (1995) (FEIS, p. I-1). The watershed assessment found that the analysis area was susceptible to mountain pine beetle outbreaks, which had reached epidemic levels in nearby drainages. In order to meet Forest Plan objectives, three statements of purpose and need were explained in the EIS:

> Treat lodgepole pine stands to manage the landscape that will result from a mountain pine beetle epidemic that is moving through the area. We will change the course of the epidemic by: altering timber stands to reduce the risk of mortality from mountain pine beetle attacks and providing a mix of age classes to reduce the potential for large future outbreaks.
>
> Rehabilitate water quality and fisheries habitat. We will reduce stream sediment and improve channel stability by; reclaiming roads not needed for long term management to reduce sources of sediment and reducing erosion and improving drainage on existing roads needed for long-term management.
>
> Contribute to the timber supply. We will contribute to this forest plan goal by offering a variety of timber sale sizes and potential timber products.

(Knox Brooks FEIS, p. I-3)

Project components included 2,519 acres of commercial harvesting and removal of 49 culverts along with the, "reconstruction of 40.3 miles of road primarily to reduce water quality impacts followed by stabilization and decommissioning of 1.7 of these miles; new closures to motorized vehicles on 15.4 miles of road including stabilization and decommissioning 13.7 of these miles; stabilization and decommissioning of 37.4 miles of roads that are currently closed; and construction of 2.1 miles of temporary and short-term roads followed by obliteration of these roads after use" (Knox Brooks ROD, p. 1).

Project Implementation

The Knox Brooks analysis area was broken down into four projects: the Powerswitch, the Cabin City, and the Knoxious Salvage timber sales as well as the Knox

Brooks Stewardship Pilot Project. While the timber sales contributed to the purpose and need described in the FEIS, restoration activities were accomplished through the stewardship contract. In describing how the project was implemented, this section will look first at the funding sources for tasks carried out by the Forest Service and then examine the work completed through the stewardship contract.

Budget Line Items and Project Work

The Knox-Brooks project area was chosen in response to the Lolo National Forest Plan direction for future conditions, and an interdisciplinary team study identifying the Twelvemile and Boyd-Tamarack Ecosystem Management Areas as impaired. As mentioned in chapter two, the National Forest System appropriation under the Inventory and Monitoring BLI funds landscape scale analysis for both the forest plan and subsequent studies. The Knox-Brooks area focuses on the Twelvemile Creek hydrological unit. The NEPA analysis used the primary purpose principle for assigning the appropriate fund code. In this case it was determined that timber production described in the purpose and need would be the primary purpose for this project. Thus, the National Forest System appropriation under the Forest Products BLI (NFTM) funded the NEPA work. Therefore, all the staff resources from various specialties would, in essence, bill their time to the NFTM Knox-Brooks fund code. The total amount spent reached approximately $693,000 (Pinchot Institute for Conservation, 2003, appendix G).

Even though the Record of Decision was signed in May of 2001 project implementation did not begin until 2002. During that time staff resources were spent to prepare and administer the stewardship contract. In order to track spending, fund codes were matched up with job codes. One challenge to this method was that the agency did

not have uniform coding and they changed year to year. Spreadsheets provided by the Lolo NF's Superior District office shows funding sources and job codes with expenditures in each category. Table #3-1 displays all line items related to the Knox Brooks project from 2002-2004. Funding sources shown refer to the budget line items in Table #2-4. Looking at the two tables, one can see that the "Roads" funding source refers to the Roads BLI under the Capital Improvement and Maintenance appropriation; "Timber" or "NFTM" matches with Forest Products BLI and "Veg. Mgmt" refers to the Vegetation and Watershed BLI, both under the National Forest System appropriation; "Salvage" or "SSSS" aligns with the Timber Salvage Sale BLI funded with permanent appropriations.

As shown, salvage paid for the bulk of sale preparation and administration work with some funding coming from the timber appropriations. References to "Gate 4-6" are part of the timber sale preparations found in the Forest Service Handbook. These describe procedures for advertising the sale, collecting bids and awarding the contract (2409.18 Ch. 12). Though the winning bidder completed the road rehabilitation and decommissioning work, designs and instructions were prepared using both Roads and Salvage BLI's. The RDHC21 in 2002 or CMRD21 in 2003 job codes paid for road and bridge inspections as well as design engineering outside the sale area in support of the service side of the stewardship contract. The SSIR21 paid for preconstruction and design work inside the sale area as part of the timber side of the contract. The Vegetation and Watershed BLI paid for required bull trout monitoring listed in the terms and conditions of the biological opinion provided by the US Fish and Wildlife Service.

Table 3-1: "Knox-Brooks Stewardship Project Job Code Crosswalk."

Funding Source	Job Code	*Project Description*	Actual Dollars	Totals Spent
		FY 2002		
Roads	RDHC21	Stewardship Contract Administration	$69,858	
Timber	TMYS07	Stewardship – Knox Brooks	$25,531	
Salvage	SSIR21	Eng – Presconstruction (Knox in SYSPR)	$10,695	
		Eng – Contract Administration (Knox in SSYS07)	$147,827	$158,522
	SSYSPR	Knox Brooks Stewardship Prep	$26,400	
		Knox Brooks Stewardship Gates 4-6	$14,808	
		Knox Brooks Stewardship Gates 4-6	$11,580	$52,788
	SSYS07	Knox Brooks Stewardship Sale Administration	$42,500	
Veg. Mgmt.	VWMW21	Knox Brooks	$20,000	
		FY 2003		
Roads	CMRD21	Stewardship Contract Administration	$52,033	
Salvage	SS1A21	Knox Brooks Stewardship Sale Administration	$8,329	
	SS1A07	Knox Brooks Stewardship Sale Administration	$26,979	
Veg. Mgmt.	NFVW07	Knox Brooks Monitoring	$15,000	
		FY 2004		
NFTM	NFTM07	Game Range and Knox Brooks Stewardship	$30,401	
SSSS	SS1A21	Knox Brooks Stewardship Sale Administration	$6,341	

Stewardship Contract

Ultimately the Forest Service awarded the contract to Tricon Timber Co. located in St. Regis, Montana. Since the value of timber was greater than the estimated cost of service work, an integrated resource timber contract was used. The sale area was 2,560 acres, with lodgepole pine designated as the only species to be cut. The advertisement offered an estimated 31,897 tons of wood products measured by scaling and designated by description (DxD), along with fifteen land management activities, i.e. service work. Remember that with DxD "the trees to be cut, or left, are designated according to the description and not left to the discretion of the contractor" (FSH 2409.19 Ch. 61.3.1). Both live and dead trees were harvested according to rigid guidelines required in the contract. Specifications varied for each cutting unit, with some areas listed as optional.

Cutting methods included thin-from-below, sanitation thinning, shelterwood seed cut with reserves and one unit using clearcut with reserves. An example of instructions for thinning from below were as follows:

> Live lodgepole pine sawlogs (over 6 inches d.b.h.) must be thinned to 70 to 100 ft^2 basal area/acre of all live trees greater than 6 inches d.b.h.. Where other species over 6 inches d.b.h., occupy over 70 ft^2 basal area/acre, all lodgepole pine in that area can be harvested.
>
> Retain lodgepole pine trees having the largest diameter and height in the dominant and codominant crown classes. These trees should have live crown ratios exceeding one quarter of the tree height and be free of damaging insects, diseases, and mechanical damage.
>
> Dead lodgepole pine meeting merchantability specifications (including green lodgepole pine with more than 20 mountain pine beetle pitch tubes on each of three of the four faces of the tree) must be harvested except as needed for snags and live cull trees...

(Knox Brooks Stewardship Contract, C Provisions, p. 131)

Final accounting for the sale was completed on January 5th 2006 showing that Tricon harvested a total of 34,401.27 tons of lodgepole pine valued at $1,016,384.95. In return for these goods, Tricon conducted road upgrades and decommissioning work worth $862,685.46. These land management credits were deducted from the total value of timber receipts, with Tricon paying for the $153.699.44 difference. An exact accounting of credit activities and their value is shown in Table #3-2, with the activity number corresponding to provisions in the contract that detail each task, and letters matching with the attached land management activity map. Comparing Table #3-2 to the map, one can see that the road decommissioning and weed treatment in the Trapper Cabin and Twelvemile drainages were valued at $55,008.00. Exact specifications were illustrated in drawings attached to the contract provided by Forest Service engineers. Through these efforts, the project goals for road reconstruction and decommissioning were

accomplished, along with the silvicultural treatments to reduce the potential for stand mortality due to bark beetle infestations.

Table 3-2: "Land Management Credit Accounting Sheet with Activity Descriptions."

Activity Number	Activity Description	Unit of Measure	Quantity	Rate $	Total Credits $
1 Map A	Reconstruction of Henderson Thompson Road 352, as per attached drawings and specifications.	Lump Sum	1	N/A	$369,889.20
2A Map B	352-1, m.p. 1.57, Survey, design, furnish, and install structures to meet the attached drawings and specifications.	Lump Sum	1	N/A	$58,000.00
2B Map C	352-1, m.p. 3.89, Survey, design, furnish, and install structures to meet the attached drawings and specifications.	Lump Sum	1	N/A	$52,990.00
2C Map D	352-1, m.p. 4.36, Survey, design, furnish, and install structures to meet the attached drawings and specifications.	Lump Sum	1	N/A	$28,193.00
2D Map E	352-1, m.p. 6.57, Survey, design, furnish, and install structures to meet the attached drawings and specifications.	Lump Sum	1	N/A	$54,520.00
2E Map F	3805, m.p. 0.33, Survey, design, furnish, and install structures to meet the attached drawings and specifications.	Lump Sum	1	N/A	$56,917.50
2F Map G	3805, m.p. 3.16, Survey, design, furnish, and install structures to meet the attached drawings and specifications.	Lump Sum	1	N/A	$51,687.76
3 Map H	Reconstruction of Thompson DeBorgia Road 378-2 and 3813, as per attached drawings and specifications.	Lump Sum	1	N/A	$72,427.45
4 Map I	Noxious Weed Treatment; Henderson Thompson Road 352-1, Thompson DeBorgia Road 378, Mineral Mountain Creek Road 3813.	Lump Sum	1	N/A	$3,000.00
5A Map J	Road decommissioning and weed treatment in the Mineral Mountain drainage, as per attached drawings and specifications.	Actual Quantities	Unest.	N/A	$36,331.50
5B Map K	Road decommissioning and weed treatment in the Trapper Cabin and upper Twelvemile drainages, as per attached drawings and specifications.	Actual Quantities	Unest.	N/A	$55,008.00

5C Map L	Texas and Valentine mine road decommissioning and weed treatment, as per attached drawings and specifications.	Actual Quantities	Unest.	N/A	$349.00
5D Map M	Road decommissioning and weed treatment, in the Middle Rock Creek drainage, as per attached drawings and specifications.	Actual Quantities	Unest.	N/A	$1,208.00
7 Map O	Rehabilitate skid trails near junction of Roads 378-1 and 444.	Actual Quantities	10 Hours	N/A	$1,350.00
8 Map P	Road Construction Cost Adjustment	Lump Sum	1	N/A	$20,814.05

(Knox-Brooks Stewardship Contract, Final Land Management Credit Accounting Sheet, December 2005)

Knox-Brooks and the Restoration Principles

This section delves into the comparison between the Knox Brooks Stewardship project and key sections of the Restoration Principles. Some criteria do not apply and are therefore excluded. Two restoration goals were given in the purpose and need for the Knox-Brooks environmental impact statement. The first was to reduce sediment delivery to Twelvemile Creek, which feeds the St. Regis River, a water quality limited stream, through the removal or upgrade of specific roads. The second was to reduce the threat posed by an imminent bark beetle infestation. Much of the analysis and discussion was spent on mountain pine beetle mortality in the Twelvemile drainage. The reasons cited for the project's purpose and need were reducing the threat to lodgepole stands and creating favorable conditions that would help retain large diameter trees in the event of an outbreak. The conditions in the project area were described as being outside the historic range of variability due to past fire suppression and therefore levels of beetle caused mortality would not be a natural occurrence. The management decision based on these conclusions is predicated on the assumption that these actions will result in a more natural forest after a beetle infestation and a subsequent fire. Keep in mind that persistent

and seral stands of lodgepole pine experience stand replacing fires at a mean interval of 112 years with this period being shortened by bark beetle epidemics (Anderson, Michelle D. 2003. p. 15, 19). The stand in the Knox Brooks analysis area was generally ninety years old and by the time of implementation beetles had already begun to move through the area. The following sections will compare the Knox Brooks project's components with the Restoration Principles.

Ecological Forest Restoration Principle

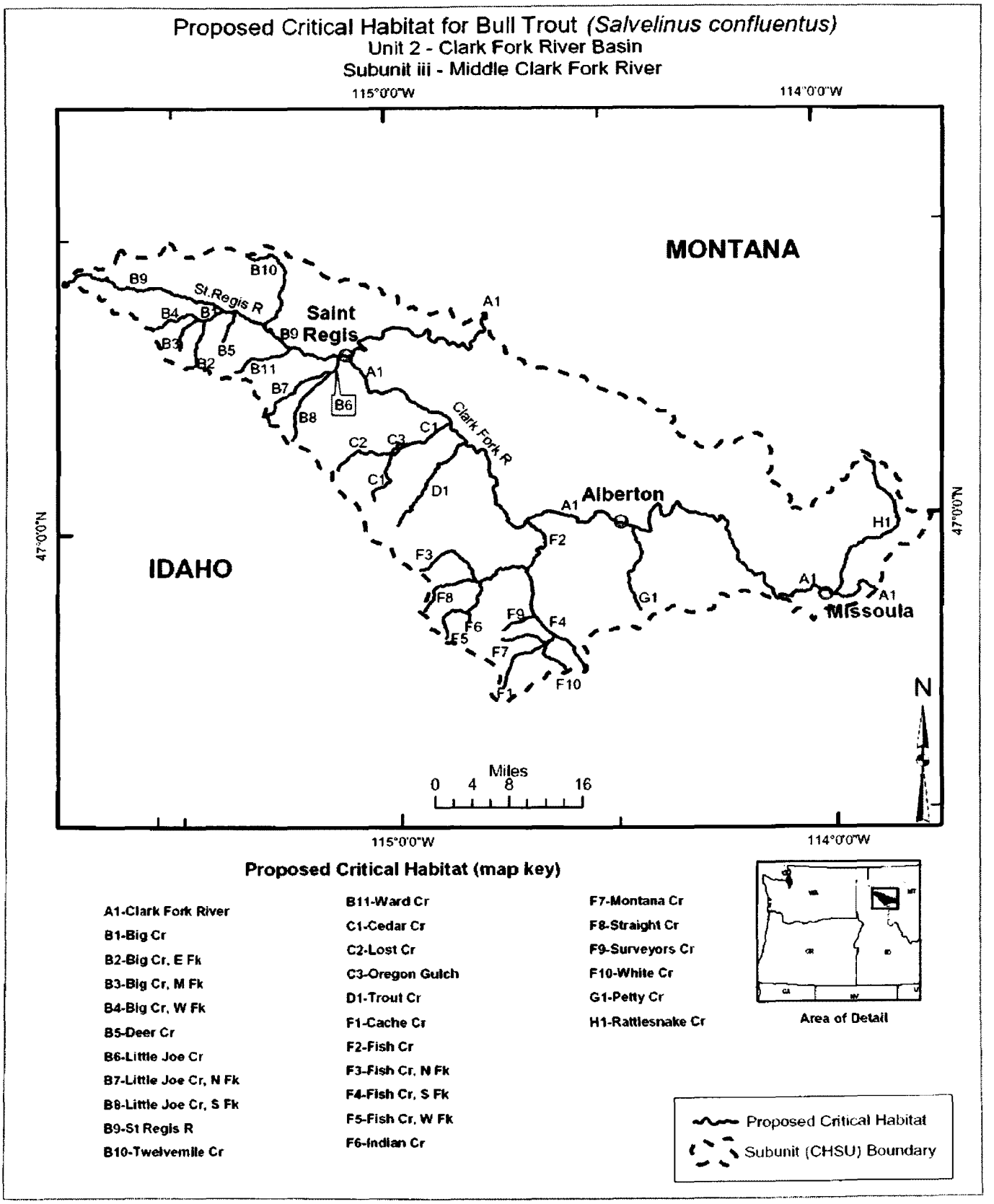
The Restoration Principles assert that improving ecological integrity ought to be the goal of any legitimate restoration project. The overall purpose should seek to restore natural processes and resiliency. The Principles state, "A restoration approach based on ecological integrity incorporates the advantages of historical models while recognizing that ecosystems are dynamic and change over time (DellaSala, et.al., 2003, p. 16). The question is whether or not the Knox-Brooks Stewardship project met these requirements. In answering, one can turn to the Principles and their associated checklist in appendix A.

The Restoration Planning Principle "incorporates numerous criteria, including making use of the best available science, monitoring and evaluation, regulatory compliance, prioritization of integrity goals, endangered species recovery, and securing adequate funding..."(DellaSala, et.al., 2003, p. 17). Any restoration plan needs to have these components and requires projects to incorporate adequate assessments and approaches as defined by the Principles; documenting these is the checklist's main priority. The Knox Brooks Stewardship project was identified through two main assessments. One, "the Inland Native Fish Strategy Environmental Assessment (INFISH) identified the St. Regis River Basin including Twelvemile Creek as a priority watershed

for inland native fish, particularly bull trout" (Knox Brooks FEIS, 2001, p. I-2). The INFISH strategy required the Lolo National Forest to amend their forest plan in order to incorporate the required Riparian Management Objectives (RMOs). The other assessment was the Twelvemile NFMA/EAWS Analysis Executive Summary that resulted in the project's purpose and need through an analysis of "...about 75,000 acres in two adjacent watersheds, Twelvemile Creek and Tamarack Creek..." (Knox Brooks FEIS, 2001, p. I-1, II-1). Without delving into their adequacy, combining the broad scale INFISH study and the Interior Columbia Basin Ecosystem Management Project (ICBEMP), the landscape level Lolo National Forest Plan, the Montana Bull Trout Recovery Plan and the Twelvemile watershed analysis, and the site-specific Knox Brooks EIS, it would appear that these meet the Planning Principle's requirement for a multi-level restoration assessment. However, the Planning Principle mandates that these assessments need to fit within a larger restoration plan grounded in conservation biology that identifies important wildlife migration corridors, ensures threatened and endangered species recovery, describes project funding, ensures implementation of a monitoring and evaluation plan, and details how the projects fits within listed restoration priorities. Such a plan would also incorporate assurances that meet the Ecological Economic Principle as well as the Community and Workforce Principle. Instead, restoration work in Knox Brooks was limited to the analysis area in the environmental impact statement, which did not detail how the site-specific treatments tie into restoration goals on the landscape and broader scale levels. In the absence of such a plan, the resulting and subsequent restoration work may occur in a haphazard patchwork without any real coordination.

Next is an examination of the assessments themselves and if they meet the criteria. The Principles state broad scale assessments should be "designed to determine the status and condition of ecological integrity across the ecoregion and the appropriate spatial layout of core reserves, landscape connectivity, and restoration areas needed to maintain or enhance integrity (DellaSala, et.al., 2003, p. 17). The criteria require the use of published classifications for describing the ecoregion, and the Knox-Brooks Final EIS does a good job when it identifies the project area as being within the "Dry Domain, Temperate Steppe Division, Northern Rocky Mountain Forest-Steppe Ecoregion (Bailey, 1994)" (Knox Brooks Final EIS, 2001, p. III-6). Even more, the description states that this area is typically a "cedar-hemlock-pine forest, Douglas-fir forest, and ponderosa pine forest," with fire, insects, disease and wind providing natural disturbances (Knox Brooks Final EIS, 2001, p. III-6-7). At the landscape level, the EIS broke down the region into sub-region, basin, sub-basin, watershed and sub-watershed with these areas matching respectively to the Bitterroot Mountain Section, Colombia River Basin, Middle Clark Fork River, St. Regis River and Twelvemile Creek (Knox Brooks Final EIS, 2001, p. III-7). Certainly this meets the Principle's criteria to use published descriptions, but does not address the needs for connectivity or core reserves because these descriptions were part of the site-specific analysis and not a separate region wide assessment. However, the Twelvemile Creek sub-watershed was identified through a larger landscape analysis, which incorporated the INFISH study that covered the Upper Colombia River basin and the Montana Bull Trout Recovery Plan, which did identify core reserves as illustrated in Figure #3-1. This begs the question, if site-specific analysis tier to broader studies does this meet the Principle's criteria or should there be a requirement for separate

Figure 3-1: "Illustration of Twelvemile Creek's (Number B10) Critical Habitat Status for Bull Trout."



comprehensive assessments? The Principle's checklist is ambiguous, but the themes of connectivity and core refugia stand out. Site-specific projects need placing within the context of landscape assessments that are part of ecoregional studies that seek to coordinate restoration activities to increase ecological integrity throughout the whole ecoregion. The goal of landscape assessments is to identify the appropriate scale for analysis, link high areas of ecological integrity as identified in the broader assessment, and properly evaluate cumulative impacts (DellaSala, et.al., 2003, p. 21). At the project level, tiering to broader scientific studies from the landscape level to ecoregional would seem acceptable if those larger assessments included details for preserving core habitat, restoring connectivity, analyzing cumulative impacts and sufficiently studying all ecosystem components. However, meeting these criteria would not be sufficient if the Forest Service line officers did not choose projects sites based on such information. In choosing the Knox Brooks project area, it was clear that the larger analysis helped identify where to focus the work, but less clear was how much the timber component played or other "multiple use" considerations.

The Knox Brooks project was set within the context of ecoregional and intermediate assessments that include the INFISH study, the ICBEMP, the Montana Bull Trout Recovery Plan, the Noxious Weed Management EIS, and the Lynx Conservation Assessment and Strategy. These assessments guide the Lolo National Forest Plan with which all projects must be consistent. Significant issues were raised in an appeal filed by the Ecology Center Inc., American Wildlands, and the Alliance for the Wild Rockies regarding the adequacy of the Lolo Forest Plan itself and the Knox Brooks project's adherence to its standards. One issue raised was the fact that the forest plan was never

revised when new significant information confirmed the negative impacts from fire suppression. The Knox Brooks Record of Decision states, "Human disturbance such as timber harvest will play a major role in insuring a variety of habitats provided by natural disturbances in past eras" (p. 3). The appeal challenges the notion that fire dependent ecosystems can be maintained through continued fire suppression and vegetative manipulation (Juel, J., Schaffer, R., Kmon, D., 2001, p. 3). Regarding another issue, the Knox Brooks FEIS described logging in thirty-three acres of habitat that meets the Northern Region's old growth standards of which fourteen acres were recognized as old growth in the Lolo Forest Plan (p. II-23). The management goal in these fourteen acres was to provide for viable populations of old growth dependent species (Lolo Forest Plan, 1986, III-104). The appeal points out that the Lolo Forest Plan "did not adopt any quantitative Standards for maintaining old growth habitat...it difficult to understand how the Lolo NF can claim to maintain viable populations of old growth dependent species if the Plan fails to recognize scientifically established amounts and distribution of old growth that would meet the habitat requirements of these species" (Juel, J., Schaffer, R., Kmon, D., 2001, p. 25). This assertion was recently upheld by the Ninth Circuit Court of Appeals in their December, 2005 ruling where they state, "...the Service is asking us to grant it the license to continue treating old-growth forests while excusing it from ever having to verify that such treatment is not harmful" (No. 03-35995, 9th Cir., Dec. 8, 2005). Another major failing of the forest plan is the lack of inventory data collection for old growth management indicator species that could inform whether past practices have ensured viable population of these species. The appeal states, "There is no information on how populations are changing to due to timber management, fire suppression, or other

management actions" (Juel, J., Schaffer, R., Kmon, D., 2001, p. 38). Without this information analyzing cumulative effects becomes problematic. In addition to these failings, the Lolo Forest Plan contains management areas specifically designated for timber production. This is in direct contradiction of the Principle's requirement that assessments place restoring ecological integrity as the central goal of any project. These flaws bring into question the adequacy of the Lolo National Forest Plan as a landscape scale assessment especially in light of the Restoration Principle's requirement that such studies "provides a foundation for assessing cumulative impacts of proposed projects from the site to the ecoregional level" (DellaSala, et.al., 2003, p. 17).

The site-specific assessment criteria offer more points of comparison than the broadscale and intermediate scale criteria. While the Knox Brooks FEIS adequately classifies the analysis area within the larger landscape and region, the importance of the restoration activities cannot be measured without complete assessments at those levels, and an adequate restoration plan that can coordinate restoration work across the landscape. In regards to addressing at-risk ecological processes or species, the FEIS states two rationales. First, it stated the need to reduce the threat from bark beetle infestations because they are not occurring at historic levels, may alter wildlife and fisheries habitat, and "can cause widespread depletion of commercial timber" (Knox Brooks Final EIS, 2001, p. I-2). The second reason explains the need to restore the watershed and reduce sediment loads from the road system in order to help recover bull trout populations, and meet the Lolo Forest Plan as amended by the INFISH study. It explained how meeting these goals will improve the resiliency and integrity of the watershed: "A long-term upward trend in water quality in Twelvemile Creek in turn contributes to improved water

quality in the St. Regis River, which currently does not meet water quality standards" (Knox Brooks FEIS, 2001, II-18). Even in light of the significant amounts of data and analysis, the Knox Brooks EIS did not adequately comply with existing laws and regulation, nor did it adequately address cumulative impacts.

In their appeal, the Ecology Center Inc. and fellow appellants detail several shortcomings with the FEIS and the project as a whole; the following section highlights some of those claims. The record of decision describes Twelvemile Creek as currently meeting state water quality standards, but it was listed in 1996 as being water quality limited, and then subsequently removed from the list due to a lack of information. Following a lawsuit challenging this removal, "the Federal Court has required Twelvemile Creek, along with all the other WQLSs on the 1996 list, to be prioritized for TMDL development... This means that there can be no more of the pollutant of concern (sediment) added to the stream until a TMDL has been approved for the stream, as required by law and regulation" (Juel, J., Schaffer, R., Kmon, D., 2001, p. 7). It is important to note that on a similar claim the Ninth Circuit did not uphold this claim. Appellants also challenged the WATSED model used to estimate sediment delivery and water flows pointing out the FEIS stated that modeled results are not absolute measures in one paragraph but then used the results as hard numbers in other places. The discrepancies bring into question if the "restoration activities will produce as much sediment reduction as the FEIS indicates" (Juel, J., Schaffer, R., Kmon, D., 2001, p. 11). The appeal next explained that the FEIS did not have an adequate range of alternatives as mandated by NEPA because none proposed removing the main Twelvemile Creek road, a major source of sediment. In addition to this violation, appellants cite the Knox Brooks

Project File Volume 2, which explains the impact of the road's reduced canopy cover on stream temperatures. They use this information to claim that without the roads removal Twelvemile Creek will never meet Riparian Management Objectives. Regarding the Endangered Species Act, the Forest Service is required to consult with the US Fish and Wildlife Service when a project may adversely affect threatened or endangered species; in this case bull trout. USFWS set forth terms and conditions under which the Knox Brooks project could go forward. Appellants assert, "it is clear from the reading of the terms and conditions that they are doing nothing at all over and above what the Forest Service is already obligated to do, as mandated by the Forest Plan and the programmatic bull trout B.O. [biological opinion]" (Juel, J., Schaffer, R., Kmon, D., 2001, p. 17). The result is that the Forest Service would merely monitor the impacts on bull trout and not actually do anything to prevent a take of the species. Just as the Forest Service must prevent a take of listed species, the ESA also requires that the agency implement programs to conserve these species as well (16 U.S.C. 1536(a)(1)). In regards to Canada lynx, appellants argue that the FEIS failed to analyze the connectivity between populations in the Twelvemile lynx analysis unit and those outside this area; it failed to provide historical population data in violation of the lynx conservation agreement; violated requirements to monitor lynx; and as a whole failed "to adequately address and provide measures necessary for the conservation of lynx" (Juel, J., Schaffer, R., Kmon, D., 2001, p.39-45). In addition to listed species like bull trout and Canada lynx, the Lolo Forest Plan requires viable populations of sensitive species as described in its Standard #27: "For plant and animal species that are not threatened or endangered, but where viability is a concern (i.e., sensitive species), manage to maintain population viability

(Lolo Forest Plan, 1986, p. II-14). Appellants argue that the Knox Brooks FEIS fails to demonstrate that site-specific activities would adhere to this Forest Plan Standard (Juel, J., Schaffer, R., Kmon, D., 2001, p. 47). The Restoration Principles place particular emphasis on the importance of biological corridors and restoration projects within the broader landscape. The appeal details the lack of analysis in the FEIS regarding cumulative effects the Knox Brooks project would have on biological corridors and if it would increase habitat fragmentation. Another issue appellants raised was the over reliance on Best Management Practices (BMPs) to mitigate soil erosion in the Twelvemile Creek drainage: "BMPs have already been shown to be inadequate by the very fact of the highly degraded Twelvemile Creek drainages. And the effectiveness of the proposed BMPs have not been proven in highly erosive soils in watersheds that are already heavily damaged by sediment" (Juel, J., Schaffer, R., Kmon, D., 2001, p. 23). As previously mentioned, appellants explained the Lolo National Forest has not generated verifiable standards for maintaining viable populations of old growth dependent species. Therefore, logging old growth stands in the project area may remove critical habitat for those species and any claims made in the FEIS that there would be no significant impact to them must be arbitrary and capricious (Juel, J., Schaffer, R., Kmon, D., 2001, p. 27-29). Even more, the Knox Brooks FEIS claimed that logging in these areas was meant to reduce the risk from stand replacing fires thereby promoting future old growth characteristics (p. II-22). The appeal takes this reasoning to task stating, "...there is no reference in the FEIS to any long-term, peer-reviewed scientific study that indicates one can successfully replace natural wildland fire with management-imposed changes so the old growth like that proposed to be "treated" can be maintained over time" (Juel, J.,

Schaffer, R., Kmon, D., 2001, p. 30). These issues illustrate that the Knox Brooks FEIS did not meet the Principle's criteria to follow all applicable laws and regulations as demonstrated through the Ninth Circuit's ruling on old growth treatments. Even more, the site-specific restoration criteria require projects to "identify the specific ecological processes, species, or functions at risk [and] focus on projects with a high likelihood of successful ecological results and low risks or where risks of inaction jeopardize important ecological values of the site." (DellaSala, D. A., et.al. 2003, p. 21). While the need to restore aquatic habitat is clear, the ecological need for reducing the threat from bark beetles and associated success of such action is questionable, especially in light of the fact that beetle activity had already begun at the time of project implementation. Still, it should be noted that if an adequate assessment finds that treating a specific area would protect an at-risk species, and fit within a restoration plan identifying the area as crucial to that species then such action may be acceptable. The burden of proof is high, but not unattainable under the Principle's criteria.

The Knox Brooks Record of Decision stated its goal was to, "Manage for a diversity of stand conditions and age classes to reduce losses to mountain pine beetle..." (p.15). This purpose was grounded in the Lolo Forest Plan goal of providing a "pleasing and healthy environment." (p. II-1). Also, part of the purpose and need was to provide timber for local economies, but the Forest Service's reasoning suggested that in doing so an ecological goal would be served. In making his decision, Superior District Ranger Rob Harper explained, "When future outbreaks come through, rather than finding a landscape dominated by one susceptible age class of lodgepole pine as is the case now, the mountain pine beetle populations will find a diverse landscape with lodgepole pine at

various age and diameter classes...I am confident this strategy will work both to preserve mature lodgepole pine through this mountain pine beetle outbreak and to reduce the extent of future outbreaks" (Knox Brooks ROD, 2001, p. 21). In answering if this addressed a specific ecological need, the FEIS response to comments was illuminating: "The Final EIS recognizes that allowing the epidemic to occur unimpeded in some areas is desirable; however, altering the course of the epidemic in other areas may be socially desirable" (p. IV-21). Socially desirable does necessarily translate into ecological need such as protecting at-risk species or old growth habitat. As stated above, if the restoration plan and accompanying assessments direct active management to treat the area with the goal of increasing ecological integrity then such action would be acceptable. Again, the burden of proof is high and the next section clarifies potential flaws in this approach.

Ecological Approaches Principle

This Principle seeks to "Determine the appropriate use of protection, passive and active restoration based on restoration assessments" (DellaSala, et.al., 2003, p.21). The first criteria instruct restoration plans to identify and protect areas with high degrees of ecological integrity, requiring any active restoration to have strong scientific backing and stakeholder support. Also, a restoration plan would require the least intrusive techniques and ensure efficiency by focusing the work on those factors most limiting ecosystem function. Since there was no restoration plan or proposals for protecting specific areas these guidelines could not be met.

The Passive Restoration Criteria requires the "cessation [of] activities that have been determined by a restoration assessment to impede natural recovery processes...including stopping destructive logging, road building, livestock grazing,

mining, building of dams and water diversions, off-road vehicle use, and alteration of fire regimes" (DellaSala, et.al., 2003, p.18, 21). The project did not meet these criteria because of new temporary and short-term road construction, as well as continuation of industrial logging that created the need for restoration in the first place. Even if the Forest Service demonstrated an ecological benefit from the proposed logging the criteria warn that without some component of passive restoration the effort is likely to fail (DellaSala, et.al., 2003, p.21). Some may question if the proposed treatments qualify as destructive logging, which is discussed in the next section.

The Active Restoration Criteria seeks to, "Reintroduce natural processes or species through direct intervention," and only when "inaction might lead to the destruction or loss of natural processes or permanent decline of a species, stream function, or rare habitat type, or where it can be demonstrated that active restoration will greatly accelerate the return to a higher state of ecological integrity" (DellaSala, et.al., 2003, p.21). One approach by the Forest Service was to log in the project area in order to reduce the threat from bark beetle activity and reduce the potential of losing old growth habitat. The agency can claim vegetative manipulation is for restoration purposes, but this is exactly the kind of practice the Principles are meant to avert in absence of strong science, stakeholder support, a well-developed restoration plan and adequate assessments. The burden of proof is high when demonstrating the ecological benefit from industrial logging. As a side note, an interesting phenomenon is the emergence of the term 'industrial logging' as a replacement for commercial logging in recognition of the need to treat the Community Interface Zone or implementing legitimate restoration projects while capturing the economic value of potential by-products. However, this recognition is not

an acquiescence of destructive logging that may occur when utilizing a highly developed and unstable infrastructure. A letter to the journal *Bioscience* warns, "mechanized fuel treatments cause collateral damage to ecosystem components, including soils, aquatics, and vegetation; they also have the potential to spread exotic plants and pathogens... Even if such treatments do reduce fire severity, the ecological cost of those treatments may outweigh any positive effects" (Rhodes, J.J., and Odion, D.C., 2004, p. 980). The authors do recognize potential benefits from such treatments, which in the case of Knox Brooks may have been reduced threat to old growth habitat and potential from fire-caused sedimentation with the subsequent impacts to bull trout. However, the Knox Brooks EIS did not adequately demonstrate those benefits as detailed in the above section analyzing restoration assessments. Even more, the Ninth Circuit Court of Appeals pointed out that potential benefits to old growth were unproven. In addition, the potential for reduced fire caused sedimentation may not outweigh the certain negative impacts from industrial logging. In correspondence to the Forest Service, the Ecology Center Inc. documented negative impacts from the contractor's failure to follow Best Management Practices: "This letter documents some of my June 29, 2004 observations of road reconstruction work occurring on the Twelvemile Creek Road... My main concern is that the Forest Service contractors are causing sediment to go directly into Twelvemile Creek.... The two photos...show the sediment having been bladed to the very edge of Twelvemile Creek, resulting in direct damage to fish habitat" (Juel, J., 2004, p. 2). Though the exact damage was not measured and did not resemble expected runoff, this certainly brings into question the possible impacts from inaction versus the realized impacts from using developed forest infrastructure. Again, if a restoration plan and assessments justify this

approach then the logging may be appropriate; unfortunately for the Knox Brooks project this was not the case. Still, the removal of sediment contributing roads and failed culverts fulfills the intent of the Active Restoration Principle. However, Twelvemile Creek Road was not decommissioned. Instead best management practices were prescribed to upgrade the road by graveling nine miles, reconstructing drainage dips and berms, curbing and redecking four bridge crossings and some side channels, and restoring four fish passages (USDA Forest Service Monitoring/Evaluation Results, 2004, p. 4). In addition, the Knox Brooks Record of Decision stated that a total of forty-nine culverts would be removed and two replaced throughout the project area (p. 12). While these efforts certainly will help restore degraded aquatic habitat, the Active Restoration Principle calls for removing those factors causing the "greatest risk to ecological integrity" (DellaSala, et.al., 2003, p. 18). The Ecology Center Inc. and fellow appellants cite the Knox Brooks project file where it describes the impacts from Twelevemile Creek Rd: "Riparian roads, such as the main Twelvemile road, not only produce sediment to nearby streams but they also reduce large woody debris, cover, and associated fish habitat" (Juel, J., 2004, p. 13). It is clear that this road poses one of the greatest risks to the creek's ecological integrity and an adequate restoration plan would have directed the removal of Twelvemile Creek Road, especially since the creek was listed as proposed critical bull trout habitat. Still, much of the road decommissioning was laudable and met the intent of the Active Restoration Principle. The real controversy is whether epidemic bark beetle infestations pose ecological risk and if the logging is an appropriate restoration approach in light of the Principle's requirements. District Ranger Harper claims:

> There are those who suggest that there is no need for action, since mountain pine beetles are a native insect functioning as it always has in natural

> landscapes for millennia. Based on research of historic forest cover and structure, natural fire regimes, and the role of mountain pine beetles in forested ecosystems, I believe the mountain pine beetle outbreak is more extensive than typically occurred in the past. Fire suppression since the 1930s has led to development of homogenous single age class lodgepole pine stands that otherwise would be broken into multiple age classes by periodic fires.
> (Knox Brooks ROD, p. 21)

The accuracy of this statement is brought into question when one looks at the reference condition for lodgepole pine in the Knox Brooks FEIS where it states, "Lodgepole pine and mountain pine beetle cycles led to stand-replacing fires at about eighty years to one hundred years over large patches" (p. III-12). Remember that this stand is about ninety years old and due for ecological disturbance. Even more, significant studies challenge the assertion that epidemic bark beetle outbreaks are a threat to functioning ecosystems and outside historic patterns. In a paper titled *Salvaging Solutions: Science-based management of BC's pine beetle outbreak* studying mountain pine beetle in British Columbia lodgepole forests, statements regarding the beetle's historic range are illuminating: "Unfortunately, empirical data of the abundance and distribution of mountain pine beetles only date back to 1910. This period of record does not span enough outbreak cycles to provide a good indication of the range of variability in the magnitude and frequency of outbreaks over the short and long term" (Huges, J., Drever R., 2001, p. 4). This highlights the problems with historical reference cited in chapter one where Higgs explains the pitfalls of relying on insufficient or inaccurate historical data. In another paper titled *Logging to Control Insects: The Science and Myths Behind Managing Forest Insect "Pests." A Synthesis of Independently Reviewed Research*, summarizing over 300 scientific studies, several conclusions challenge the rationale stated by Ranger Harper. Regarding thinning to control beetle activity in the

project area, the paper explained that modeled results based on increased tree vigor show decreased beetle activity in lodgepole stands, but there were no long term studies to verify this conclusion (Black, S.H., 2005, p. 8). In addition, "Mitchell et al. (1983) suggested that thinning improved the vigor of stands and reduced attacks by beetles. However, there was significant variation in the percentage of trees attacked on plots with similar vigor" (Black, S.H., 2005, p. 8). The absence of long term studies and lack of historical data highlight the uncertainty in the logging approach. Even more, in the absence of sufficient analysis demonstrating the ecological benefit of logging treatments versus passive restoration, one may conclude a precautionary approach would have directed the logging proposals be removed. Ranger Harper recognizes that treatments in Knox Brooks were not meant to stop or slow the outbreak, rather they were meant to reduce the threat and impacts from future outbreaks (Knox Brooks ROD, 2001, p. 21). However, "The mountain pine beetle has been an integral part of lodgepole pine ecosystems almost as long as the ecosystems have existed, with beetle epidemics playing an integral role in the structure and dynamics of these communities (Fuchs 1999)" (Black, S.H., 2005, p. 2). Even more, since the beetle infestation had already begun at the time of project implementation, no amount of treatments could have stopped or altered the outbreak (Black, S.H., 2005, p. 7). Ranger Harper's statements reflect a common viewpoint implying that since forest conditions today do not mirror historical references then they are not natural and therefore any subsequent event would not be natural. This is very controversial and the Principles instruct in the face of high controversy and uncertainty restorationists should use a precautionary approach. The intersection between the Restoration Principles and the Precautionary Principle is key when dealing with

uncertainty. The burden of proof rests with the proponent of active restoration, in this case logging to reduce the impact of beetle outbreak, not on those questioning its validity, which in this case was not done.

Following the Passive and Active Restoration criteria for Knox Brooks, the project should have focused on removal of all sediment contributing roads and failed culverts while protecting the area from logging and other human induced habitat-altering activities. In addition, ecological disturbance such as beetle outbreaks and wildfires should be allowed to move through the area unimpeded in order to restore those processes. Just because these may occur outside historic levels does not prove ecological harm or justify industrial logging. The levels of controversy surrounding the ecological benefit of the logging proposals and uncertainty in the expected results preclude this approach. On a side note, controversy and uncertainty ought not be weighted equally in all circumstances. For example, the long-term benefits of road decommissioning certainly are greater than the short-term impacts from carrying out the work. Still, there is level of uncertainty as to the initial amount of resulting sedimentation and removing the road may be socially controversial. In these cases it should be clear that the potential ecological benefit would outweigh the uncertainty regarding short-term impacts. In addition, social controversy is not the same as ecological controversy and the Principles place restoring ecological integrity as the central goal. Therefore, the combination of minimal uncertainty coupled with social controversy should not preclude a project that increases ecological integrity.

Looking back at the Knox Brooks project, the failure to protect areas identified as functioning with high degrees of ecological integrity coupled with the absence of

adequate assessments and plans meant that restoration work could not be coordinated across the larger landscape and ecoregion, therefore it did not satisfy the general Ecological Approaches Principle. Such plans and assessments could have directed some logging in the project area if it could have been sufficiently proven that doing so would have increased the project area's ecological integrity. The Active Restoration Principle was only partially fulfilled by the removal of roads, and culverts. Keeping the Twelvemile Creek Road and logging to reduce the threat from bark beetles meant that the associated criteria could not be met. Finally, no provisions were included to stop activities that impede natural recovery so the Passive Restoration criteria were not satisfied.

Adaptive Management Principle

This Principle states, "Monitoring and evaluation must be assured before restoration proceeds, and be incorporated into the cost of the project" (DellaSala, et.al., 2003, p.21). Though the Knox Brooks project had a monitoring and evaluation team, its success was mixed. Originally team members represented the Mineral County Watershed Advisory Council, Community Foundation, Resource Advisory Council, Extension Service, Soil Conservation District, the Montana Sierra Club Chapter and the St. Regis School District. Members met three times and many dropped out due to the five-year commitment and frustration with the process. Adequate funding was not secured before project implementation as described in the USDA Forest Service Stewardship Contracting Pilots Monitoring/Evaluation Results 2004: "We are not able to do water quality measures, wildlife impacts, economic impacts or forest health monitoring in any quantitative way. As a result, our evaluation is based on "feel" more than anything else"

(p. 15). The team did begin to plot points for evaluation, but did not finish them. Though some changes were made through monitoring these were related to the appraisal of wood products rather than ecological factors. Since much of the environmental monitoring was not accomplished, the adaptive management criteria were not met.

Ecological Economics Principle

The Ecological Economics Principle states, "Develop or make use of restoration incentives that protect or restore ecological integrity" (DellaSala, et.al., 2003 p. 22). The criterion separated public and private land, but does require that restoration activities apply across ownerships. Many points offer goals for federal reforms rather than specific project requirement. Looking at these one can see that Knox Brooks did meet some of these objectives. Specifically, funding was provided for multi-year contracting, though monitoring was not included. The best value criteria are required in the stewardship contract authority. It states, "The contracting officer shall award all stewardship contracts on a best value basis, considering criteria other than cost or price" (FSH 2409.19 Ch. 63.1). The Federal Acquisition Regulations (FAR) details the considerations for determining best value, which closely follow the criteria set forth in the Principles. Specifically, both require preference for local workers and businesses: "Contractor shall provide a statement describing the benefit to local and rural communities, such as hiring local residents, subcontracting to local and rural contractors, purchasing supplies, lodging, and so forth" (FAR 4G37.708-2(b)). Also included are the bidders past performance and provisions to train or refine workers' job skills and knowledge. These also meet the Principle's criteria that call for "contractors to include a training and employment component that will increase the capacity of existing displaced timber

workers and mobile workers to access and perform high-skill, long-duration work" (DellaSala, et.al., 2003 p. 23). For the Knox Brooks project, Tricon Timber Inc. was awarded the contract based on the determination that it was local, defined as being within Mineral or Sanders County, and it was a small business of around 100 employees. Overall, stewardship contracting is an extremely effective mechanism for meeting the Principle's requirements in regards to supporting local workers and businesses, especially because additional contractor qualifications can be added during the collaboration phase.

The most glaring contradiction between the Knox Brooks project and the Restoration Principles relates the requirement that "For public lands, restoration funding should not include off – budget funds generated from commercial activities" (DellaSala, et.al., 2003 p. 23). This contradicts the heart of stewardship contracting because it invalidates the good-for-services provision in the regulations. The Principles' intent is to decouple the link between the timber program and restoration work. Looking at the funding sources for the Knox Brooks project, all but the bull trout monitoring and some roadwork came from either the timber products appropriation or the salvage sale permanent fund. The Forest Service's current trend is to find ways to fund restoration work without additional appropriations. This calls into question reasoning by forest managers that cite the need to log for ecological purposes, particularly when purpose and need statements also include meeting timber demands. Keep in mind that only those lands determined to be suitable for timber production in the forest plan can have the timber volume go toward the targets set in the Program Budget Advice. In the Knox Brooks project all but one unit fell into this classification, so nearly all the timber output went toward meeting the timber target. Some claim that line officers will look at this when

developing restoration projects, but for Knox Brooks there was no evidence supporting this view. However, the suspicion will always be present as long as the timber sale program funds restoration planning and implementation, this includes salvage sales. In regards to the actual road upgrades and decommissioning, the contract guarantees the quality of work while strictly guarding against abuses by the contractor to take undesignated trees. Critics of the goods-for-services provision often cite the incentive for contractor abuse to inflate the service credits earned. In order to address this concern some have called for separating the timber and service work between two different contractors within the stewardship requirements. Regardless of new innovations, stewardship contracting will never meet the Ecological Economics criteria as long as it links forest products to restoration work. This is a major drawback to the Principles because the criteria allows for the sale of restoration by-products and if there are adequate restoration plans and assessments, then the risk of abuse could be negligible especially in light of proper sale administration and project monitoring.

Communities and Workforce Principle

The Communities and Workforce Principle states, "Effective restoration depends on strong, healthy, and diverse communities and a skilled, committed work force" (DellaSala, et.al., 2003 p. 23). Knox Brooks met some of the listed criteria, while others either were not met or did not apply. Specifically, the split-pricing mechanism sought to maximize the value of small diameter wood products by reducing the cost for those trees, while maintaining normal pricing for larger diameters. Also, Tricon was tooled to process small diameter trees. Economic interests were kept local and a multi-year contract added to long-term interests. However, the intent of the Principles is to have those long-term

interests set in the context of a restoration plan across the landscape, which of course this project did not have. Regarding the Quality Job Force Criteria, the USDA Forest Service Stewardship Contracting Pilots Monitoring/Evaluation Results 2004 reported that approximately forty local employees worked on the project earning eighteen to nineteen dollars per hour, while worker knowledge was increased by implementing the design specifications for culvert removal and bridgework (p.12, 14). Some aspects were successfully reached regarding the Participatory Principle that seeks to "Encourage involvement of a diversity of communities, interest groups, agencies, and other stakeholders at all levels" (DellaSala, et.al., 2003 p. 23). Multi-party monitoring and the normal NEPA notice and comment provisions allowed many different interests to participate in the project. Unfortunately, the planning process was completed within the Forest Service instead of through a collaborative process. Though not specifically required by law, the Forest Service Handbook currently mandates collaboration and states, "Collaboration for stewardship contracting projects is typically expected to go beyond the public involvement requirements of NEPA analysis. This involvement should begin at the project design stage and continue throughout the life of the project" (2409.19 Ch. 61.12a). If the agency brought the Twelvemile analysis that identified the need for watershed restoration to public and began designing a project with input before initial scoping letter were sent, then it would have begun the collaboration process at the appropriate time. In addition, if all stakeholders' concerns were adequately addressed through early collaboration, then the project may have avoided appeal. In absence of this process during the planning stage, the ecological benefit of the logging did not have the support of all stakeholders. In all, the Knox Brooks project met some of the criteria in

the Community and Workforce Principle, while also illustrating the need for early collaboration and consensus.

Conclusion

The Knox-Brooks Timber Sale and Road Rehabilitation stewardship project was mainly funded through timber and salvage sale dollars with the restoration work accomplished by a goods-for-services mechanism. These two factors preclude the project from meeting the Ecological Economics Principle even though best value contracting was used. While the road decommissioning work partially met ecological objectives, the rationale for logging was controversial, legally questionable and not shown to meet broader restoration objectives, therefore, the Ecological Approaches Principle was not met either. Knox Brooks demonstrated the infancy of restoring ecological processes and the need for more concrete evidence that shows the benefit of this approach on the broader landscape. Comparing the Ecological Restoration Principles to Knox Brooks demonstrates the need for regional and landscape planning in future projects with appropriate assessments completed at each level. Without integrating site-specific restoration within such a plan, projects risk being done in a patchwork fashion. Finally, restoring ecological processes, the most controversial work, will be harder to gain consensus without a precautionary approach. The Forest Service can use the Restoration Principles as guidance for planning and implementing future projects, and the next chapter illustrates how to use the existing framework toward this end, as well as suggesting changes that will facilitate the process.

Chapter Four – The Restoration Principles and Integration Opportunities

The Restoration Principles offer sound ecological approaches based on site-specific, broad and landscape scale assessments guided by a comprehensive restoration plan. In addition to restoring ecological integrity, the Principles also require project to pay a family living wage while maximizing economic value for restoration by-products. As demonstrated in the previous chapters, funding sources pose some of the greatest obstacles to applying the Principles. Even more, significant controversy surrounds active restoration approaches that seek to use logging as a means to emulate or restore ecological processes, which will continue to draw suspicion without a precautionary approach to planning, assessments and implementation. Current laws, regulations and budget structure work against applying the Principles and continue the trend of self-funded restoration projects. This chapter will look at how to reverse this trend through the structures already in place, and then by exploring changes in laws that directs forest management.

Stewardship Contracting Opportunities

Stewardship contracting offers excellent opportunities for advancing some aspects of the Restoration Principles, mainly through the required collaborative process. While Forest Service line officers may initiate a collaborative group, agency personnel can only act in an advisory role. Group formation may begin outside the agency, but they must offer a wide representation of all stakeholders. Ultimately, the decision rests with forest managers, however, "Commitments made by the line officer to the collaborative group are to be honored, consistent with existing laws and regulations" (FSH 2409.19, 2005, Ch. 61.12(a)(3)). Successful collaboration hinges on the ability of participants to address

one another's goals and garner commitments from the line officer. For restoration proponents, it would be advisable to present the Principles as one of the goals. This process is in compliance with the Participatory Principle, especially the requirement that, "No one interest or community should be afforded control of or undue influence on public-land management decision making" (DellaSala et.al., 2003, p. 23). Project proposals that generate some revenue will likely be easier to move forward in the agency, and for those promoting the Restoration Principles, avoiding the goods-for-services mechanism will not be realistic. In other words, the Ecological Economics Principle does not allow for off budget funding for restoration projects, which eliminates the trade of timber for service work in stewardship contracts. The Principles state, "Successful restoration on public lands requires reforming federal agency funding mechanisms and contracting procedures to remove incentives for ecologically and socially damaging activities" (DellaSala, et.al., 2003, p. 22). Even though the Principles seek to sever funding for restoration from commercial activities, they state "...restoration byproducts derived from ecologically based restoration projects may have value secondarily. Contracting mechanisms, therefore, must be developed that are driven by ecological objectives." (DellaSala, et.al., 2003, p. 22). The hidden message is that projects are not driven by ecological need if they have provisions allowing the use of timber receipts to pay for the restoration work. This is certainly debatable since the stewardship contract is designed for restoration projects, but while abuse is a reality, as Knox Brooks demonstrated, it is not inherent in the stewardship authority. The real debate is about what qualifies as restoration, not necessarily whether the stewardship contract mechanism allows bad restoration. A purist would use only service contracts and then give away any

timber removed. A more pragmatic approach would be to separate the timber receipts as much as possible from the restoration work. One method to accomplish this would be to use different contracts: one for the timber sale and one for the service work, with the latter paid for by retained receipts. For example, on the Suislaw National Forest the Eichler Project used both an integrated service and an integrated timber contract. One part of the project was the Eichler Thin where, "the Forest Service bundled tree thinning, slash treatments, creation of downed woody debris and temporary road construction and maintenance into [an integrated] service contract" (Kauffman, M., Fitzpatrick, K., 2004, p. 9). The Forest Service used retained receipts from a previous stewardship contract to implement Eichler Thin and then sold the by-products through an integrated timber contract in the second part of the project called Eichler Deck (Kauffman, M., Fitzpatrick, K., 2004, p. 9-10). Remember, in stewardship contracting any excess timber dollars are called residual receipts and may be spent on additional service work, transferred to another stewardship project, or sent to the Stewardship Trust Fund. Once transferred away from the original project they become retained receipts and can be spent according to the guidelines in the Forest Service Handbook. Instead of being generated through controversial logging projects like in Knox Brooks, retained receipts could come from fuels reduction projects that follow the guidelines in the Principles.

Still, some ambiguity remains as to the Principles' allowance of using retained receipts because the Ecological Economics criterion prohibits the use of off-budget funds. The question then is whether the use of the Stewardship Trust Fund violates the Principles or more specifically, are retained receipts always considered off-budget funds

even when transferred to a permanent budget line item and then subsequently appropriated to stewardship projects?

In any case, the goods-for-services provision and using retained receipts will most likely not meet the Principle's criteria, but projects can come as close as possible. The Community Protection Zone criteria describe at length the difference between fuels reduction work for home protection and that for restoration stating, "Distinguish between fuel-reduction treatments that restore ecological integrity and those that serve primarily to protect property and human life" (DellaSala et.al., 2003, p. 22). Specific guidelines define this zone and may need to be a point of compromise among stakeholders if specific on-site analysis demonstrates a need to expand the zone. Combining community protection fuels reduction work with restoration activities in a stewardship contract offers opportunities to generate funding without accepting more controversial approaches. Also, collaborative group expenses may be paid from retained receipts. These "may defray the direct costs of local multi-party process monitoring and support the collaborative process by paying for facilitation, meeting rooms, travel, incidental expenses, data collection, and dissemination of monitoring findings to the public" (FSH 2409.19, 2005, Ch 67.2.1(c)). Stewardship groups can require project multi-party monitoring throughout implementation and post-project evaluations. This may incorporate the Adaptive Management Principle where specific restoration techniques could be changed if necessary. The stewardship collaborative can also establish additional criteria for evaluation of best value determinations. "Evaluation factor content and purpose may be developed based partially on needs identified through the community collaboration phase under the stewardship authority. Consideration may include such elements as utilization

of local workforce, improvement of skills available in the local workforce, increased health of local industries, and reliance on local and rural small businesses" (FAR 4G37.708-2(c)). Combining this opportunity with the Jobs Criteria under the Community and Workforce Principle could guarantee a workers right to organize, receive a living wage, or make recommendations for defining the local workforce. For all topics, the contracting officer should be available to keep project implementation realistic.

Stewardship contracting allows for special agreements that are exempt from FAR requirements and the competitive bidding process. Agreements are special cases that involve cost sharing with the Forest Service, usually involving a non-profit organization, the state, tribe, local governments or colleges. In every case the primary qualification must be met: "That is, does it advance the mission of the proposed partner/applicant, other than for monetary gain, and achieve the Forest Service's resource land management goals for the national forests that meet local and rural community needs" (FSH 2409.19, 2005, 64-Exhibit 01)? These agreements offer an opportunity to pursue specific restoration goals and may move unfunded projects forward that do not have timber components. Unfortunately, this mechanism furthers the idea that restoration should either pay for itself or be funded by those outside the agency. On the other hand, if a project cannot move forward due to lack of funding, those entities wishing to enter into an agreement may be able to ask for a special earmark in the next appropriation cycle if a broad coalition of interests can lobby the congressional delegation.

Forest Service Budget and Restoration Opportunities

As the last example in the section above demonstrated, working within the budgetary decision making process offers opportunities to fund specific restoration

projects or increase key Budget Line Items. Looking at Table #2-1, one can follow the budget formation timeline and see that between February and April Senate and House subcommittees meet to decide funding levels based on the Agency Request in the President's budget. During this time citizens can submit testimony and attend hearings asking for special earmarks or budget increases. Given the Forest Service budget structure and the multiple BLIs used to fund projects, deciding where to increase funding can be difficult. In support of this task, a coalition of environmental groups published, in February 2006, the Green Budget, Fiscal Year 2007, National Funding Priorities for the Environment. In the section covering the Forest Service budget, some of the recommendations suggested increasing funding for specific programs: Forest Legacy, Economic Action, Roads Maintenance, Wildlife and Fisheries Management, and the Office of International Programs (p. 34-37). Referring back to Table 2-4 in chapter two, one can see all the different line items mentioning restoration as a goal. The Green Budget touched on a few of these, but in order to incorporate the Restoration Principles into the current budget structure one needs a more comprehensive approach as the next section details.

Funding Restoration

The Restoration Principles "...provide a national vision and guidance for the establishment of a sound restoration agenda..." (DellaSala, et.al., 2003, p. 20). Key to this vision is the intersection between Restoration Project Planning and Assessment Principles. As demonstrated in chapter three, in order to avoid controversial and haphazardly placed projects, they need to be set within a broader landscape and ecoregional context to achieve restoration goals. Without a guiding document

coordinating these efforts, the result will be numerous and maybe overlapping plans and assessments. The Forest Service budgetary process offers an opportunity to meet these goals and incorporate numerous aspects of the Principles without requiring legislative action.

The Forest Service budget could be directed in a manner that promotes ecological restoration. The starting point begins with the Chief's Strategic Plan described by the agency as the "framework for our annual performance plan, which guides agency units in proposing project-level work, while they consider the opportunities and challenges detailed in their local unit plans. The proposed work is then summarized in a performance budget and funded through annual budget appropriations" (USDA Forest Service, 2004, p.1). Every program must fit within the context of the Chief's plan therefore it is crucial that the first goal be ecological restoration. Looking at the current Strategic Plan, one would think that restoration is already a primary focus with its mention in three of six goals. The key difference is that the Chief's plan uses forest health language that has a basis in much of the controversial reference condition issues discussed in chapter one. One example is the goal to reduce the risk from catastrophic wildfire that includes logging forests outside the wildland urban interface in fire regime condition class two and three. Restoring ecological integrity and the using a precautionary approach are not factors in the existing Strategic Plan, which sets it apart from the Principles.

In order to present a clear vision a new goal would need to be phrased as follows: Conduct Forest Service activities in a manner that restores ecological integrity and avoids uncertainty while promoting ecological economics, stable communities and quality jobs. By providing a clear goal in the Strategic Plan, the Principles could be incorporated into

the current system through the budgeting and accounting processes. As detailed in chapter two, the line officers receive the Program Budget Advice (PBA) from the Washington D.C. office, which supports the Strategic Plan. This document assigns targets or objectives with specific units of measurement for each line item, and thereby illustrates agency priorities through the level of funding and corresponding targets. Forest team leaders will use the PBA to develop work plans and prioritize projects for the following year. This is one side of the budgetary process, the other is reporting where the money was spent. The "USDA Forest Service WorkPlan System" is one method used to track expenditures to each BLI within a single project and includes three categories: the activity name, job code and fund codes, i.e. BLIs. With this system restoration projects could have an activity name, call it ERES, and a consistent job code that would match up with corresponding BLIs. The result would be an accounting method that has a consistent activity name and uses a static job code that taps numerous appropriations to complete the project. For example the Roads expanded BLI, Wildlife and Fisheries Habitat Management BLI and the Vegetation and Watershed BLI could pay for a restoration project intended to improve bull trout habitat by decommissioning roads and placing large woody debris in streams. The WorkPlan reporting would name this activity ERES with a corresponding job code thereby showing the exact dollar amounts spent from each BLI. Through this method of budgeting and accounting current appropriations could be prioritized to support ecological restoration. Even more, this can be accomplished through the existing decision space currently given to line officers. However, one problem is that current appropriations are not at levels that support this goal. Before

looking at how Congress should direct appropriations, explaining how executive action could help is prudent.

The Restoration Plan

In 2000, the President ordered a report to address the impacts from the wildfires of that year. The result was a paper titled *Managing the Impacts of Wildfire on Communities and the Environment: A Report to the President in Response to the Wildfires of 2000*, which became the foundation for the National Fire Plan. Subsequently, both Secretaries of the Departments of Agriculture and Interior, state governors and many other stakeholders developed what is now called the 10-Year Comprehensive Strategy with an associated Implementation Plan. These publications provided direction for the National Fire Plan that now directs policy for wildland fire across all ownerships. It also integrated its goals into applicable policies and procedures, and set a comprehensive budget with recommended targets. Using this same approach, the President could order a national restoration plan based on the Principles. Details for such an undertaking ought to be completed through a bottom-up approach. In any case the Restoration Principles should provide the backbone for a national plan by incorporating specific criteria. First and foremost, the primary objective should focus on restoring ecological integrity with programs to include cooperation from other landowners. The Precautionary Principle should guide restoration approaches by shifting the burden of proof to those advocating controversial projects with a high degree of scientific uncertainty. In these instances, projects would provide a test case in a controlled experiment rather than be put forth as a good approach for widespread use. The national restoration plan would also direct active management to focus on "factors that are currently limiting ecosystem recovery and

integrity" (DellaSala, et.al., 2003, p.20). The national plan needs to offer guidance prioritizing restoration within the most degraded areas, places that would involve the least intrusion, and landscapes identified in threatened and endangered species recovery plans. Identifying opportunities for ecological processes to function unimpeded and detailing provisions for acquiring and protecting intact landscapes would be key. Also, the plan should incorporate the Adaptive Management and Monitoring Criteria. The use of best value determinations and collaboration would be crucial, and should include the Quality Jobs Criteria. Finally, the national plan should be supported by a dedicated budget detailed in the Agency Request to Congress.

Funding Restoration

Congressional appropriations should fund the national restoration plan by increasing funding to specific BLIs and reducing others that are detailed in the Agency Request. Some debate exists among budget reformers whether or not to lump all restoration activities into one BLI or to keep the current system where multiple BLIs fund one project; the former would require legislative budget reform (Wicksersham, K., Wood, M., 2006, interview). Since this section looks at ways to implement the Principles within the existing framework, the focus will be on using multiple line items. Chapter two listed appropriations for BLIs that mention restoration as a goal, followed with an explanation of some common funding sources. Not all of those should fund restoration and still many more could be used. Table #4-1 illustrates which line items should fund the plan and provides recommended dollar amounts to each BLI.

Table 4-1: "Integrated National Restoration Plan Funding Table" (Dollars in Thousands).

Appropriation Title	Program or Budget Line Item/Expanded BLI		Appropriations
Forest and Rangeland Research	Wildlife, Fish, Watershed, and Atmospheric Sciences Research*		$142,700
	Vegetation Management and Protection Research*		$142,700
	Forest Resource Inventory and Monitoring *		$235,723
State and Private Forestry State and Private Forestry	Forest Health Management/Federal Lands		$55,000
	Forest Health Management/Cooperative Lands		$55,000
	Cooperative Forestry/ Forest Stewardship Program		$37,000
	Cooperative Forestry/ Forest Legacy Program		$100,000
	Cooperative Forestry/Economic Action Program		$25,000
National Forest System	Inventory and Monitoring +		$0.00
	Wildlife and Fisheries Habitat Management		$250,000
	Grazing Management ++		$25,000
	Vegetation and Watershed Management	Establish Forest Vegetation	$42,580
		Manage Rangeland Vegetation	$100,000
		Maintain and Improve Watershed Conditions	$250,000
		Manage Noxious Weeds	$25,000
	Mineral and Geology/Manage ECAP & AML		$25,000
Wildland Fire Management	Fire Operations-Other	Rehabilitation	$15,000
		Fire Research and Development +++	$25,000
		Joint Fire Science Program +++	$8,000
Capital Improvement and Maintenance	Roads		$450,000
Capital Improvement and Maintenance	Deferred Maintenance and Infrastructure Improvement		$100,000
Land Acquisition	Acquisition of Lands to Complete Land Exchanges		$100,000
Permanent Appropriations	Reforestation Trust Fund		$30,000
	Roads and Trails (10 Percent) Fund		$14,000

* These program titles were taken from the 2005 Budget Justification descriptions.
+ The National Forest System/Inventory and Monitoring program was moved to Forest and Rangeland Research/Forest Resource Inventory and Monitoring. All associated programs would be integrated into new ecoregional research stations.
++ The inventory and monitoring portion would be integrated into the new ecoregional research stations.
+++ Portions of this funding would be integrated into new research stations for fire related studies outside the Wildland Urban Interface.

As illustrated in chapter three, before working on the environmental impact statement a full watershed assessment was completed using the Inventory and Monitoring BLI. In order to meet the broader landscape and ecoregional assessment criteria a massive effort must begin to collect and compile data across ownerships with less reliance on modeling and more on site-specific data. This could be done in coordination with the smaller watershed assessments completed at the forest level. In support of this could be the creation of new research stations for each ecoregion using the Forest and

Rangeland Research appropriation and the Inventory and Monitoring BLI. The result would be integrated, multi-level assessments that follow guidelines set forth in the national plan.

The State and Private Forestry appropriation contains some programs that would support ecological restoration objectives. The Forest Health program separates state and federal land, and "maintains healthy, productive forest ecosystems by preventing, detecting, and suppressing damaging insects, diseases, and plants. FHM reports on insect, disease, plants, and forest health trends across all land ownerships nationwide" (Forest Service Budget Justification, 2005, p. 6-3). Obviously some red flags go up with this kind of language because its wording suggests that insects, plants and diseases are not part of natural disturbance regimes. However, this program is a major component to controlling invasive species through the *National Strategy and Implementation Plan for Invasive Species Management.* The objectives for this BLI could be rephrased to emphasize invasive species control while allowing native species to play their traditional roles. Using the Federal and Cooperative lands EBLI these efforts could be coordinated within federal lands as well as across ownerships. The Cooperative Forestry BLI funds the Forest Stewardship Program that partners "... with State forest resource management agencies, the program provides landowners with long-term, multi-resource management plans for improving forest health, restoring riparian areas, enhancing wildlife habitat, maximizing the value of standing timber, and sustaining the flow of benefits and services that all healthy forests provide" (Forest Service Budget Justification, 2005, p. 6-21). Traditionally, this program focuses on plans relating to timber output for private and state lands while meeting environmental requirements. These funds could just as easily focus

on meeting goals identified in the national restoration plan. In fact, this could be a major funding source for helping states and private landowners plan restoration work in conjunction with efforts on federal land. The Forest Legacy program is another potential funding source under Cooperative Forestry that could help acquire crucial areas identified in the ecoregional assessments. "The program operates on a 'willing buyer – willing seller' basis and is a non-regulatory, incentive-based land conservation program" (Forest Service Budget Justification, 2006, p. 6-26). This fund could be used in conjunction with the National Forest System/Landowner Management BLI and the Land Acquisition/Acquisition of Lands to Complete Land Exchanges appropriations. Each of these allows the Forest Service to obtain lands that could be crucial for restoration objectives. Reestablishing the Economic Action Program and integrating it within the national restoration plan could further the Ecological Economics Principle. This EBLI formerly funded the Rural Community Assistance and the Forest Products Conservation and Recycling programs. This funding source has broad support among community forestry advocates because, among other things, it was designed to promote collaboration across ownerships, find new and expand existing uses for restoration by-products, help rural communities broaden and diversify local economies, and assist local towns generate plans to coordinate activities with federal land managers. This program could aid the expansion of restoration businesses within traditional timber and mining towns, but it was eliminated in the 2006 budget.

One of the goals under the Ecological Economics Principle states, "Successful restoration on public lands requires reforming federal agency funding mechanisms and contracting procedures to remove incentives for ecologically and socially damaging

activities." (DellaSala, et.al., 2003, p. 19). To meet this objective the National Forest System appropriations should only use BLIs that seek to restore ecological integrity. Looking back at table 4-1, these would include Wildlife and Fisheries Management, and portions of Vegetation and Watershed. Since parts of the latter support timber and grazing programs only the Maintain and Improve Watershed Conditions and Treat Noxious Weeds expanded BLIs should be used. Also, included would be the Abandoned Mine Land and Environmental Compliance and Protection expanded BLIs under Minerals and Geology that funds the clean up of toxic mine sites and hazardous materials. The Principles call for separating restoration from the timber program. This would eliminate using the Timber Products line item even though many would argue that logging is an important restoration tool. In fact, cutting some trees may be necessary to achieve objectives identified within the national restoration plan and associated assessments. However, implementation should not support a program that is a major cause for much of the restoration need. Other BLIs described in Table #4-1 should fund the NEPA analysis and project activities. This would also preclude the use of permanent appropriations such as the K-V and the Salvage Sale Funds. Livestock grazing on National Forests is a significant use of our public lands and many allotments need environmental review in order to assess if the land needs restoring. The National Forest System Grazing Management BLI funds monitoring and inspection of grazing allotments as well as the issuance of permits. The Passive Restoration Principle calls for ending livestock grazing in those areas in need of restoration. The Manage Rangeland Vegetation expanded BLI under Vegetation and Watershed Management BLI funds rangeland improvement activities in addition to collecting and storing related data, and

maintaining or restoring riparian environments (Forest Service Budget Justifications, 2005, p. 7-51). In addition, the Range Better Fund under Other Appropriations provides for building fences and other structures as well as improving range conditions for livestock grazing. These efforts are reported with those in the Vegetation and Watershed Management BLI. Just as the timber sale program should not fund forest restoration, administering, maintaining and awarding grazing allotments should be separated from restoration needs tied to the grazing program. Toward this end, environmental monitoring and inventory of grazing allotments and restoration assessments should be part of Forest and Rangeland Research while any associated restoration projects should be administered through the Manage Rangeland Vegetation expanded BLI. In addition, this expanded BLI should be given the sole purpose of restoring former grazing allotments while all activities that support the grazing program should use the Grazing Management and Range Betterment Fund; the latter should be reported under the Grazing Management BLI and not the Vegetation and Watershed Management BLI. Finally the last item under National Forest System appropriations is the Hazardous Fuels BLI, which seeks to restore fire-adapted ecosystems but relies on the flawed Interagency Fire Regime Condition Class Guidebook. The Hazardous Fuels BLI should only fund projects in the wildland urban interface following criteria under the Community Protection Zone Principle. Congressional action should direct funding to specific line items as outlined in Table #4-1. This will demonstrate the needed commitment for stopping ecological harmful activities while promoting restoration. In order to ensure this goal, the increased funding for restoration would need to come from the Forest Products and Grazing Management BLIs so as to de-emphasize the timber and grazing programs. The combination of a

restoration plan based on the Restoration Principles and reduced budget for resource extraction would ensure the Principles' implementation. Also, this would prevent the misappropriation of restoration dollars to timber sales because the Ecological Approaches Principle would provide clear guidance for the use of active restoration.

The Wildland Fire Management appropriation works to implement the National Fire Plan and offers a few opportunities to integrate associated activities into the Restoration Principles. As described in chapter two, the Fire Research and Development BLI is actually part of the Forest and Rangeland Research appropriation. The Joint Fire Science Program works in conjunction with this program to conduct "inventory and mapping, and evaluation, scheduling and monitoring of the effects of fuel treatments" (Forest Service Budget Justification, 2005, p. 8-25). Integrating these funding sources into the Principles-based restoration research stations would effectively refocus current efforts to restore fire-adapted ecosystems so that they follow a more precautionary approach. This will enable scientists working to restore disturbance regimes to collect more specific data so as to lessen the reliance on models that use vegetation as a proxy for all other ecosystem components, and do not factor in soils and climatic conditions.

As previously discussed in chapter two, the Capital Improvement and Maintenance/ Roads and Deferred Maintenance and Infrastructure Improvement BLI are responsible for funding road decommissioning and upgrade work. Also, the Road and Trail (10 Percent) Fund under permanent appropriations has provided resources to accomplish restoration activities. "Typical work included reconstructing stream crossings to replace deteriorated culverts or to allow for fish passage, surfacing roads to reduce sediment, and improving public road access to national forest land" (Forest Service

Budget Justification, 2005, p. 12-23). Each of these programs could focus more on removing roads that degrade ecosystems, or if they are deemed necessary improve or put them into storage.

As demonstrated, there are many potential restoration funding sources within the existing budget. By including a new vision in the Chief's Strategic Plan, creating a national restoration plan and increasing specifically mentioned BLIs while decreasing others, many of the Principle's objectives could be met. Implementing these new spending priorities within the WorkPlan accounting system will give the agency a new activity name code that can be used for several BLIs. These new approaches need Presidential direction and Congressional support through increased funding levels in the annual appropriations legislation. However, even without these, restoration could be directed and implemented through the Strategic Plan, Program Budget Advice and a new accounting activity code.

Ecological Restoration Primacy

While the above approach focuses on the budget and accounting system for promoting ecological restoration, many would argue that current laws need changing or repeal to stop questionable restoration projects or activities that cause ecological degradation. To some this means ending the sale of trees across all national forests system lands, no matter the reason or ecological benefit. This does not allow the Principles' criteria to maximize the value of restoration by-products in communities that provide the workforce, or for creating wildfire protection zones. At the same time, "specific reforms are needed to fund restoration projects not tied to traditional commercial timber operations." (DellaSala, et.al., 2003, p.19). The following sections

look at the primary laws that could be changed to support implementing the Restoration Principles.

Since the Principles allow the use of restoration by-products, there needs to be a mechanism that allows the sale of those goods, but still promotes ecological restoration. At the heart of this traditional conflict is the commercial timber sale program. Ending this program does not necessarily mean the prohibition of selling timber; just that the Forest Service would not have a program designed to produce board feet. In other words, timber harvest would need to fit within the context of the Restoration Principles, effectively ending the commodification of timber from our National Forests. However, to accomplish this goal the primary laws creating and directing the agency must be repealed or changed as explained in the next section and summarized in Table #4-2. As a side note, in order to effectively utilize restoration by-products there needs to be viable infrastructure to process these goods. It would be irresponsible to claim that restoration projects would produce enough goods to keep local mills and loggers in business. At the same time our National Forests should not be the source for propping up the timber industry. This seemingly intractable contradiction has a potential solution: county owned community forests derived from private timberlands that would have been sold to developers or other interests. These lands are often subdivided which causes a loss of open space and diminishes a town's rural character. Congress should seriously consider a buy out of these lands from willing sellers and give them over to county ownership with some strings attached. Namely, that they be managed sustainably and undergo an initial assessment per the Principles with those lands needing improvement being placed into a restoration zone. These zones would fit within the restoration plans by public agencies

and taken out of timber production until they can be managed sustainably. In addition, the Forest Service would complete periodic restoration assessments in order to ensure that the community forests are managed sustainably with a clause that requires placing impaired lands into restoration zones. This would further the goal of working across private and public ownerships and help integrate restoration needs across the landscape. At the same time, lands not in need of restoration would help support timber dependent communities and be managed sustainably. Legislation would need to be crafted to ensure these components, and should involve input from benefiting communities. In this manner, needed restoration infrastructure would be maintained and rural counties would have a vested interest in managing sustainable forests without expecting our National Forests to provide the timber. As previously mentioned, in order to realize this last goal key laws would need amending.

The surviving original language in the Forest Service Organic Act of 1897, 16 U.S.C. § 475, states in part, "No national forest shall be established, except to improve and protect the forests within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber..." This last section should be changed to read, "and other beneficial ecosystem services." This would recognize the intent of the Principles where they explain, "Intact forest ecosystems provide the natural capital, including clean air and water, upon which all life and all human economies ultimately depend" (DellaSala, et.al., 2003, p.16). Changing this bedrock of forest policy will support changes in other related laws.

The primary law directing the purpose for our national forests is the Multiple Use and Sustained Yield Act of 1960. Repealing this law would effectively end the perceived

mandate to produce timber from our national forests. However, since the Principles allow the sale of restoration by-products, and this law recognizes the legitimacy of other forest uses, a simple rewording of a couple sections may suffice. Section 528 would read, "It is the policy of the Congress that the national forests are established and shall be administered to maintain the greatest level of ecological integrity first and foremost, with ecosystem services, wildlife, fish, watershed and outdoor recreation purposes as secondary considerations." By placing maintenance of ecological integrity as the primary goal, the purpose of the national forests would essentially turn to ecosystem management. Also, this primacy would ensure that any potential commercial exploitation of the secondary considerations would not trump ecological integrity. Section 529 would state, "The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for the purposes of multiple use and sustained yield of the several products and services obtained there from only in cases where the ecological integrity of said areas can be ensured."

Table 4-2: "Proposed Language Changes for the Organic Act, MUSYA and NFMA."

Law Title	Section	Current Language	Proposed Language
The Forest Service Organic Act of 1897	475	No national forest shall be established, except to improve and protect the forests within the boundaries, or for the purpose of securing favorable conditions of water flows, and to furnish a continuous supply of timber...	No national forest shall be established, except to improve and protect the forests within the boundaries, or for the purpose of securing favorable conditions of water flows, and other beneficial ecosystem services.
Multiple Use and Sustained Yield Act of 1960	528	It is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed and wildlife and fish purposes.	It is the policy of the Congress that the national forests are established and shall be administered to maintain the greatest level of ecological integrity first and foremost, with ecosystem services, wildlife, fish, watershed and outdoor recreation purposes as secondary considerations.

	529	The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for the purposes of multiple use and sustained yield of the several products and services obtained therefrom.	The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for the purposes of multiple use and sustained yield of the several products and services obtained therefrom only in cases where the ecological integrity of said areas can be ensured.
National Forest Management Act of 1976	1604(e)(1)	...provide for multiple use and sustained yield...in particular include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness.	...provide for multiple use and sustained yield ...in particular include coordination of ecosystem services, wildlife, fish, watershed, outdoor recreation and wilderness while ensuring the primacy of ecological integrity.
	1604(g)(3)(A)	...including the related systems of silviculture and protection of forest resources to provide for outdoor recreation (including wilderness) range, timber, watershed wildlife and fish	...including ecosystem services, wildlife, fish, watershed, outdoor recreation and wilderness...
	1604(g)(3)(E)	insure that timber will be harvested from National Forest System lands only where-	insure that timber will be harvested from National Forest System lands only where such activities are part of a restoration plan designed to increase ecological integrity and where-

The National Forest Management Act, 16 U.S.C. 1600-1614, is the most comprehensive law directing national forest management. Unfortunately a few simple revisions will not be adequate for implementing the Restoration Principles, but changing the MUSYA to place ecological integrity as the primary value has a significant impact in that all NFMA references will thereby incorporate this priority. For example, under section 1602 requiring the creation of the Renewable Resource Program, there are several references to the MUSYA in describing how the program will develop the National Forest System. With a primary purpose of ensuring ecological integrity and a focus on ecosystem services, development of renewable resources would shift to clean water, air, nutrient cycling, carbon sequestering, wildlife habitat, fisheries, etc. Other references in the NFMA to the MUSYA would need some changing such as section 1604(e)(1) and (2)

that detail assurances to be included in national forest plans. Specifically, language in 1604(e)(1) stating, "provide for multiple use and sustained yield...in particular include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness," would change to "in particular include coordination of ecosystem services, wildlife, fish, watershed, outdoor recreation and wilderness while ensuring the primacy of ecological integrity." This language would strike MUSYA references to silviculture, timber and range in section 1604(g)(3)(A) replacing parts stating, "...including the related systems of silviculture and protection of forest resources to provide for outdoor recreation (including wilderness) range, timber, watershed wildlife and fish;" Section 1604(g)(3)(E) would change to "insure that timber will be harvested from National Forest System lands only where such activities are part of a restoration plan designed to increase ecological integrity and where-," the rest of this section could stay unchanged. Next, 1604(g)(3)(F) dealing with the practice of clearcutting should be deleted as should section 1611, which allows the establishment of an annual sale quantity of timber along with provisions for salvage or sanitation logging. Incorporating these changes would allow timber harvest only in the context of restoration and then only where ecological integrity is the guiding principle. At the same time, ecosystem services would become the main economic output from our national forests, thereby shifting the agency's mission and culture away from the 20th century focus on range and timber.

Briefly mentioned in chapter two, the Secure Rural Schools and Community Self-Determination Act of 2000 (P.L. 106-393) was new legislation covering payments to states that traditionally received funds through the Twenty-Five Percent Fund Act of May 23, 1908. The 2000 legislation allowed the creation of Resource Advisory Committees

(RACs) in those counties that chose to take payments based on the three highest return years under the 1908 law. Commonly referred to as title II funds because of the law's authorizing section for this provision, the deposited amounts could be spent in accordance with the law's purpose: "Project funds may be used by the Secretary concerned for the purpose of entering into and implementing cooperative agreements with willing Federal agencies, State and local governments, private and nonprofit entities, and landowners for protection, restoration and enhancement of fish and wildlife habitat, and other resource objectives consistent with the purposes of this title" (16 U.S.C. 500 Note). The law calls for the use of best value contracting and for RACs to represent a balance of viewpoints by listing three categories of participants, requiring representation from each. This advances the Participatory Principle, which states "Adaptive all-party processes should strive to build consensus around ecological, social, and economic principles and practices by focusing on common values, mutual goals, and the resolution of conflicts based on class, culture, language, and religion (DellaSala, 2003, p. 23), and the Ecological Economics criteria for best value contracting. This law is set to expire on September 30th, 2006. Reauthorization should include an additional provision for calculations determining the funding levels to counties. Specifically, in addition to the options of keeping the twenty-five percent determination, or taking an average of the three highest return years, a third option could allow for a percentage to be given to counties based on their appraised value of ecosystem services. For instance, the value of water filtration to downstream communities, or of total carbon sequestration in situ could be appraised and then those counties could receive a calculated percentage. This way title II funds may become a significant source of funding for restoration projects that would in

turn increase the value of those ecosystem services. County commissioners would have a new incentive to keep the land-base in not only a rural condition but also in a continually improving ecological state. The valuation of ecosystem services would need significant research and analysis, therefore a commission should be formed establishing guidelines for the Forest Service to use when conducting appraisals.

Finally, the Healthy Forest Restoration Act of 2003 should be repealed in its entirety. This law's foundations were based on the fire condition class modeling detailed in chapter one and does not follow the criteria described in the Restoration Principles' Community Protection Zone criteria. The law limits judicial review, truncates public participation in the NEPA process and furthers the misperception that past fire suppression has altered the entire landscape to the point where current disturbance from fire and disease will never result in a natural condition. On the whole, this law embodies what the Principle's sought to prevent:

> "Due to recent pressure from decision-makers to address forest fires in the West, federal agencies are developing plans to implement environmentally questionable 'restoration' projects on a national scale...The National Fire Plan has funded fuel reduction projects (many of them commercial timber sales) in endangered species habitat, roadless areas, old-growth forests, and areas where there is no scientific evidence that forests are at risk from catastrophic fires (DellaSala and Frost 2001)."

(DellaSala, et.al., 2003, p. 14)

The HFRA authorizes timber sales to reduce supposed threats from fires in old growth stands based on historic conditions: "In carrying out a covered project, the Secretary shall fully maintain, or contribute toward the restoration of, the structure and composition of old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type..." (16 U.S.C. 6512(e)(2)). The practice of thinning forests to retain their old growth characteristics, based on historic conditions does

constitute a precautionary approach. Forest managers will often cite that such treatments will leave the largest trees and the thinning will reduce the threat of losing critical habitat. While this theory may have some validity, there are no long-term studies supporting this conclusion. While critics of HFRA have long pointed this out, one voice rises above the din. In the landmark case *Ecology Center Inc. v. Austin*, the Ninth Circuit Court of Appeals ruled, "...the Forest Service proposes to continue treating old growth without first taking the time to observe what those effects actually are. In light of its responsibilities under NFMA, this is arbitrary and capricious" (No. 03-35995, 9th Cir., Dec. 8, 2005). The HFRA codified a controversial practice that is not substantiated by significant scientific testing, and it should stand as a lesson for restorationists as to what may happen when nascent theories are advanced as fact.

Conclusion

Changing or repealing the aforementioned laws would certainly help advance implementing the Restoration Principles. However, it will take years of lobbying and public education to advance such proposals. A more pragmatic approach would call for a national restoration plan based on the Principles in conjunction with promoting budgetary increases that fund line items primarily focused on restoration. However, convincing Congress to de-emphasize the timber program and direct sufficient funds to restoration will take significant work, especially when there are expectations for our national forests to produce timber. Creating county owned community forests that are managed sustainably could lessen these expectations. The best short-term approach may be to focus on the decision space afforded line officers at all levels of the agency. Knowing when forest and regional team leaders meet, and advocating for more ecological

restoration projects will likely have the best results. Changes to the accounting system can happen from the Washington D.C. office and calling for the Chief to create a restoration specific goal in the Strategic Plan may prove easier than lobbying Congress. Finally, advancing the Restoration Principles within the budgetary process will have a significant effect in the culture of the Forest Service and may prove the best way to bring our laws into the restoration century.

Appendix A

"The Restoration Principles"

(Adapted from the article appearing in *Ecological Restoration*, issue 21:1, March 2003)

A Citizen's Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria

by Dominick A. DellaSala, Anne Martin, Randi Spivak, Todd Schulke, Bryan Bird, Marnie Criley, Chris van Daalen, Jake Kreilick, Rick Brown, and Greg Aplet

Decision makers, scientists, and the interested public now recognize that there is an urgent need to restore forest ecosystems after decades of intensive logging, fire suppression, road building, livestock grazing, mining, and invasions by exotic species (see Noss and Cooperrider 1994, Ricketts and others 1999, Pimmentel and others 2000 for reviews). Such damaging activities have compacted soils, channelized streams, fragmented forests, suppressed natural fire, assisted the spread of some invasive species, and caused the loss of native species and their habitat (Noss and Cooperrider 1994, Heilman and others 2002).

Years of efforts by scientists, forest practitioners, environmentalists, restoration workers, and others have helped develop restoration methods and techniques. The result has been both good and bad restoration projects — models of what to do and what not to do when restoring forests. Today, job programs are being developed a round the country to create a work force focused on restoring ecosystems rather than on resource extraction. Local govern m e n t s and citizens are working together to re s t o re watersheds that provide drinking water for their communities (for example, Ashland Watershed Alliance in southwest Oregon). Restoration programs and ideas continue to be developed to help us understand how to restore forests holistically.

At the same time, there are serious questions as to whether some proposed "restoration" activities are really beneficial to the landscape. Due to recent press u re from decision-makers to address forest fires in the West, federal agencies are developing plans to implement environmentally questionable "restoration" projects on a national scale (see DellaSala and Frost 2001 for limitations; also see White House Healthy Forest Legislative Initiative; www.nifc.gov). The National Fire Plan has funded fuel reduction projects (many of them commercial timber sales) in endangered species habitat, road-less areas, old-growth forests, and areas where there is no scientific evidence that forests are at risk from catastrophic fires (DellaSala and Frost 2001). An increase in use by the Forest Service of the commercial timber sale program to "restore" federal lands poses risks that logging will adversely affect fish and wildlife habitat and ecologically sensitive landscapes.

The Citizens' Call for Ecological Forest Restoration is proposed as a national policy framework to guide sound ecological restoration policy and projects. Through these restoration principles, we seek to articulate a collective vision of ecologically appropriate, scientifically supported forest restoration. Scientifically credible principles and criteria provide a yardstick with which to evaluate proposed forest restoration policies and projects that can be used both on the ground and in policy debates. While this paper was developed to respond to restoration policy and projects on federal lands, the principles and criteria are relevant to other land ownerships as well. By including social criteria, the restoration principles also help to bridge the gap between what is good for the forest and what is good for communities and workers. Moreover, by integrating science with community participation in restoration, the principles are consistent with the expanded approach to ecological restoration as defined by Eric Higgs (1997).

The forest restoration principles and criteria were developed by a diverse group of forest activists and forest ecologists from around the United States with input from representatives of forest practitioners and community-based forestry groups. These people first met in 2001 at a Forest Activist Restoration Summit in Boulder, Colorado and in a subsequent restoration workshop near Spokane, Washington in 2002. This diverse group came together because they recognized that to develop and implement a sound restoration agenda, the conservation community must learn from and work with both scientists and practitioners. At the Boulder meeting, forest ecologists established the scientific basis for the discussion that generated these

principles. Forest practitioner, labor, and community-based forestry advocates then added their traditional, experiential and methodological knowledge, and provided focus on the socioeconomic and hands-on aspects of restoration that were further refined and presented in the subsequent workshop.

The restoration principles covered here are predicated on the assumption that successful ecosystem restoration must address ecological, economic, and social needs, including community development and the well-being of the restoration work force (that is, in the spirit of an expanded approach to ecological restoration; see Higgs 1997). While emphasizing that the primary goal of restoration is to enhance ecological integrity by restoring natural processes and resiliency, this approach proposes three core and interrelated principles to set the stage for what constitutes good ecological restoration: 1) ecological forest restoration; 2) ecological economics, and 3) communities and work force (Figure 1).

In order to implement ecologically sound restoration, all three core principles must be working together. Restoration principles and criteria provide a transparent and verifiable (on the ground) approach to guide and evaluate the efficacy of restoration projects, programs, and policies with respect to the core principles. The restoration principles can be used to guide the process of restoring ecological integrity through the use of restoration assessments that are conducted at multiple spatial scales. The principles outline specific restoration methodologies and criteria for adaptive management through monitoring and evaluation of restoration projects.

The principles also address the importance of an economic and institutional framework that accounts for non-market ecological services (Rasker 1994, Power 1996a, 1996b), such as clean air and water, and that encourages the long-term viability of communities by operating within the capacity and resiliency of forest ecosystems, fostering a culture of environmental sustainability, and meeting human needs. This includes the development of a highly skilled and well-paid work force to perform high-quality restoration work that proactively engages people through socially just and economically viable training and employment systems.

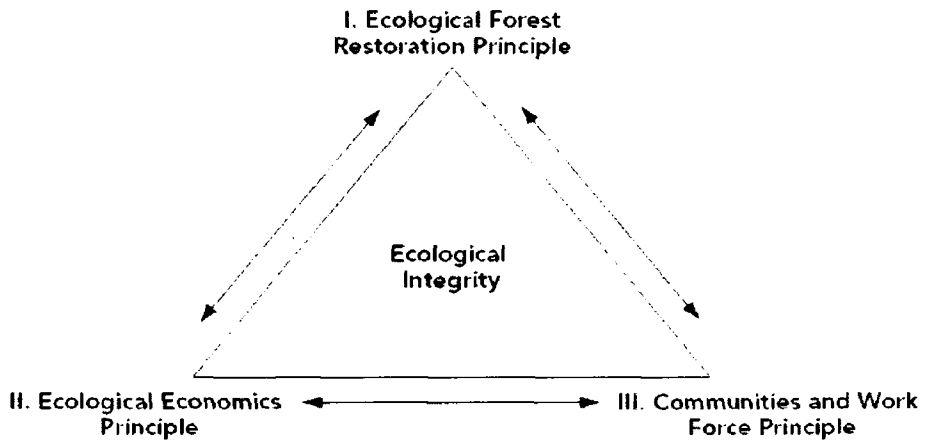


Figure 1. General relationship between core restoration principles and ecosystem integrity. *Courtesy of the authors*

Core Forest Restoration Principles

Sound forest restoration requires an integrated, multi-disciplinary approach rooted in conservation biology and ecosystem restoration that includes preserving and protecting intact landscapes (particularly those that serve as reference or baseline conditions); allowing the land to heal itself; and, where necessary, helping it to do so through active restoration. Through thoughtful strategies employed over time, we can reestablish sustainable human connections to the land, creating high-quality restoration jobs and encouraging conservation-based economies.

The restoration principles approach to restoring ecological integrity is the basis for three core principles, several working principles, and numerous criteria that are provided in a checklist format for use by practitioners (Appendix 1). The checklist can be taken into the field to evaluate the efficacy of restoration projects in meeting the goal of restoring ecological integrity. It is also useful for helping to inform policymakers regarding what constitutes ecologically and socially appropriate restoration.

Ecological Forest Restoration Core Principle

Enhance ecological integrity by restoring natural processes and resiliency

Effective forest restoration should have as its primary objective the reestablishment of fully functioning ecosystems. Ecological integrity can be thought of as the "ability of an ecosystem to support and maintain a balanced, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of natural habitats within a region" (Karr and Dudley 1981, Karr 2000). A restoration approach based on ecological integrity incorporates the advantages of historical models while recognizing that ecosystems a re dynamic and change over time. This is fundamental to the development of restoration approaches and is the core principle central to all related principles and criteria.

Ecological Economics Core Principle

Develop and employ the use of economic incentives that protect or restore ecological integrity

Intact forest ecosystems provide the natural capital, including clean air and water, upon which all life and all human economies ultimately depend. Restoration of healthy ecosystems is an investment in regaining the natural capital that has been diminished by decades of fore s t degradation. An economic and institutional framework that fully accounts for these non-market ecological services should be created in order to recognize the value of intact ecological systems and to guide restoration efforts. As such, sound restoration must balance achieving restoration goals with the cost of restoration, while giving priority to ecological effectiveness (Higgs 1997). However, because ecologically sound forest restoration is a long-term natural process that will not always provide short - term benefits and may not pay for itself, a time frame for economic analysis must be used that recognizes the long-term benefits of restoration (for example, clean water, re s t o red fire regimes) often must take precedent over concerns regarding efficiency (Higgs 1997). There f o re, economic incentives that drive the degradation of forests must be replaced with restoration incentives that protect and re s t o re ecological integrity.

Communities and Work Force Core Principle

Make use of or train a highly skilled, well-compensated work force to conduct restoration

Ecological restoration also must become an important component of an ecologically sound, socially just forest economy. This approach has the potential to support the long-term viability of communities within the capacity and resiliency of f o rest ecosystems, while fostering a culture of environmental sustainability. A highly skilled, well-compensated work force is essential for restoration to meet high ecological standards. Building the restoration economy requires a commitment to regional training capacity (multi-jurisdictional and interdisciplinary), skill certification, consistent funding over decades, and assuring workers' rights to organize and bargain collectively. The process of advancing ecological restoration must be open, inclusive and t r a n s p a rent, and should contribute to breaking down class, culture, gender, language, and religious barriers.

Ecological Forest Restoration Principles and Criteria

Restoration Project Planning Principle

Document all restoration projects in the context of a restoration assessment and appropriate restoration approaches that restore ecological integrity

All restoration projects must be planned and implemented in the context of a restoration assessment (see Forest Restoration Assessment Principle) and use appropriate restoration approaches (see Forest Restoration Approaches Principle) to restore and enhance ecological integrity. Because ecological systems are inherently complex and dynamic, it is impossible to accurately predict all the consequences of our actions, even well-intentioned restoration actions. The more controversial or experimental the project is, the

smaller the scale should be. If there is high risk and weak scientific support, the burden of proof falls upon the project's proponents.

Restoration planning incorporates numerous criteria, including making use of the best available science, monitoring and evaluation, regulatory compliance, prioritization of integrity goals, endangered species recovery, and securing adequate funding (Appendix 1, I.1).

Forest Restoration Assessment Principle

Conduct a restoration assessment prior to restoration activities

A restoration assessment must be done prior to implementing a restoration project or beginning restoration activities. The assessment is conducted to determine if any restoration activities are required, and is used to 1) identify the root causes of ecosystem degradation at multiple spatiotemporal scales, including eco-regional, intermediate, and site-specific (see related criteria below); 2) determine appropriate methods for restoring degraded systems; and 3) create a spatially explicit prioritization of restoration needs across spatial scales (Appendix 1, I.2). The assessment and corresponding actions are then followed by sufficient monitoring that measures progress towards restoring a degraded system so that it is more resilient to disturbance and can persist in the absence of further human intervention.

The restoration assessment should first be conducted within the context of a broader ecoregional assessment designed to determine the status and condition of ecological integrity across the ecoregion and the appropriate spatial layout of core reserves, landscape connectivity, and restoration areas needed to maintain or enhance integrity (also see DellaSala and others 1996). Examples of ecoregional assessment criteria can be found in Scott and others (1993), Noss and Cooperr i d e r (1994), and Ricketts and others (1999) or obtained from published regional assessments available for most ecoregions. The inclusion of additional scales of analysis provides a foundation for assessing cumulative impacts of proposed projects fro m the site to the ecoregional level (Appendix 1, I.2).

Ecological Restoration Approaches Principle

Determine the appropriate use of protection, and passive and active restoration based on restoration assessments

Restoration projects are designed to move f o rest ecosystems toward a higher level of ecological integrity. The restoration plan chosen for a particular place should be based on the most effective techniques recognized through the restoration assessment while favoring the least intrusive or intensive methods that will effectively move the area toward ecological integrity. This approach will usually produce the best results for the least amount of time and effort, promoting efficient use of restoration resources. It is important to note that t h e re will be projects where short - term treatment impacts should be accepted because the project will result in long-term positive gains in ecological integrity (for example, removal of roads, barriers to fish passage, removal of exotic species).

In some cases, effective restoration may require taking action in areas of relatively high ecological integrity. In other cases, the best approach will be to focus restoration efforts on more degraded landscapes. Factors such as broad-based support among restoration stakeholders and the potential for restoration of landscape linkages between ecologically intact areas may lead to restoration efforts that are more time consuming and costly, but are necessary to achieve restoration objectives. Restoration assessments can be valuable in resolving such issues.

The following are three approaches and related criteria that define the range of f o rest restoration methods used to re s t o re ecological integrity (Appendix 1, I.3).

Protection of Areas of High Ecological Integrity

Identify and secure areas of high ecological integrity

Relatively intact natural areas and core refugia that have high ecological integrity and little need for restoration should be protected and maintained. Protection of areas of high ecological integrity will provide critical sources of biodiversity, and/or reference landscapes needed as a source of baseline information (Noss and Cooper-rider 1994).

Areas of high ecological integrity that may serve as core refugia include: rare community types (for example, as identified in the Natural Heritage database), intact old-growth forests, native forest ecosystems operating within the bounds of historic disturbance regimes, intact watersheds and large roadless areas, designated wilderness areas, and unimpaired streams and other aquatic habitats of high conservation value (Noss and Cooperrider 1994, DellaSala and others 1996).

Passive Restoration

Cease activities that have been determined by a restoration assessment to impede natural recovery processes

Halting activities that cause degradation or prevent ecosystem or species recovery should be considered the first and most critical step in restoration (Kauffman and others 1997). This form of restoration, which should be based on thoughtful analysis and planning, must be distinguished from passive management, which has been criticized as mere neglect (Agee 2002). Passive restoration should take precedence where it is vital to eliminate or reduce the root causes of ecosystem degradation, including stopping destructive logging, road building, livestock grazing, mining, building of dams and water diversions, off-road vehicle use, and alteration of fire regimes (Appendix 1). Passive restoration can be applied alone or in combination with active restoration techniques provided that the primary goal is to stop the degradation and restore ecological integrity.

Active Restoration

Reintroduce natural processes or species through direct intervention

Direct human intervention is needed in cases where it is necessary to reintroduce (or secure) natural processes, at-risk species, or regionally extirpated species, and in cases where ecosystem composition, structure, and function are degraded or hindered by factors such as compacted soils, channelized streams, invasive species, or fire suppression. Active restoration methods include, but are not limited to, planting, prescribed burning, road obliteration, removal of barriers to fish passage and water diversions, invasive species control, fuel treatment, and riparian restoration. Such approaches should target areas of greatest risk to ecological integrity and be implemented in situations where the risks of no action outweigh those of active restoration. However, given the infancy of forest restoration science, active restoration should take a precautionary approach and make use of monitoring and adaptive management techniques.

Community Protection Zone Principle

Distinguish between fuel-reduction treatments that restore ecological integrity and those that serve primarily to protect property and human life

A clear distinction must be made between fuel-reduction treatments that re s t o re ecological integrity and treatments that protect property and lives by reducing fuels in the "community protection zone" (CPZ: a limited area between rural communities and undeveloped forestlands, also known as the wildlands-urban interface). Treatments protecting property and lives in the CPZ may address the human safety issue, but should not be considered forest restoration in themselves since they may only involve very limited aspects of ecological integrity. Mechanical fuel treatments, such as thinning small-diameter trees , can be a step forward toward forest restoration if planned and implemented in the context of a restoration assessment. However, it must be recognized that fuel-reduction treatments alone do not address the wider range of ecological issues included in a comprehensive restoration plan and may result in degraded soils, native vegetation, and wildlife habitat (Brown 2000, DellaSala and Frost 2001). Specific criteria related to the CPZ, defensible space (Cohen 2000), and treatment types for use in this zone (Center for Biological Diversity 2002) are covered in Appendix 1, 1.4.

Adaptive Management Principle

Monitoring and evaluation must be assured before restoration proceeds and should be incorporated into the cost of the project

Ecological forest restoration of any type at any scale is a process of adaptive management. Due to high levels of complexity, uncertainty and risk, restoration require an approach that is careful, flexible and able to respond to change and new information. Acceptable restoration projects must include a transparent

public process that provides for assessment, implementation, monitoring, evaluation, and adaptive criteria (Appendix 1, I.5). Given that many restoration projects do not pay for themselves, monitoring and evaluation are often underbudgeted and, therefore, not included in restoration. The lack of sufficient monitoring and evaluation hampers the ability of ecological restoration to contribute to our understanding of restoration ecology. Therefore, monitoring and evaluation must be included as criteria in the assessment of restoration projects.

Ecological Economics Principle and Criteria

Economic Framework Principle

Develop and employ positive incentives to encourage ecologically sound restoration

Positive incentives are needed to encourage ecologically based restoration and eliminate incentives that encourage activities that are ecologically degrading. Such incentives should protect and restore ecological integrity within an ecological and institutional framework that accounts for the benefits and costs associated with restoring natural capital. As such, incentives that encourage activities that degrade the ecological health of the landscape are inconsistent with improving ecological integrity or otherwise may cause ecological damage and, therefore, must be eliminated. Investments in ecosystem restoration should be applied across land ownerships, fostering co-management agreements between the federal government and the private sector (Appendix 1). For this to work at the policy level, specific reforms are needed to fund restoration projects not tied to traditional commercial timber operations. We propose several criteria to encourage the development of positive restoration incentives (Appendix 1, II.6).

Communities and Work Force Principle and Criteria

Community/Work Force Sustainability Principle

Effective restoration depends on strong, healthy and diverse communities and a skilled, committed workforce

Restoration must foster a sustainable human relationship to the land that promotes ecological integrity, social and economic justice for workers and communities, and a culture of preservation and restoration. In turn, effective restoration depends on strong, healthy and diverse communities and a skilled, committed work force. While the restoration principles provide the "ecological horse" for steering such an approach, the "economic cart" generated by restoration activities can provide numerous opportunities for making use of a highly skilled work force. As such, restoration must be linked to economic development in a way that prioritizes the long-term interests of communities over short-term and non-local economic interests (Appendix 1, II.6). Given the extensive degradation of forests throughout the nation, there are numerous opportunities for fostering cooperation between restoration scientists and a community work force interested in restoring forests and creating high-quality jobs and sustainable communities through related criteria (Appendix 1, III.7).

Participatory Principle

Encourage involvement of a diversity of communities, interest groups, agencies, and other stakeholders at all levels

Meaningful involvement of a diversity of communities, interest groups, agencies and other stakeholders (at local, regional, and national levels) should be achieved through open, inclusive, and transparent decision-making processes with recognition of and respect for differences. This is the foundation for an expanded approach to restoration (Higgs 1997) that takes advantage of opportunities to blend scientific understanding of restoration with local and traditional knowledge of forest ecosystems (Appendix 1, III.8; also see Kimmerer 2002). Local communities can be more involved in restoration through "all-party" monitoring, provided that such actions are part of the larger public participation in public lands restoration and related criteria for inclusion.

Conclusion

The Citizens Call for Ecological Forest Restoration establishes a vision for restoring natural processes and native species in forested ecosystems through an adaptive and inclusive process. Ecologically sound forest restoration provides us with the opportunity to heal the land and to restore a viable community connection that in practice achieves an integrated vision of bio-cultural restoration. To ensure that this vision becomes reality, we must continue efforts to bring community forestry and conservation groups together. We must commit to thoughtful, science-based restoration to ensure that future generations can experience and enjoy intact, diverse forested landscapes having the highest ecological integrity. While these principles do not address regional ecological differences, they do provide a national vision and guidance for the establishment of a sound restoration agenda, as well as the tools and a checklist to implement responsible forest restoration on the ground. The principles were forged in hopes that they will encourage the sharing of information and development of alliances among organizations and citizens that are necessary for successful forest restoration through an expanded approach. We have decades of restoration work ahead. It is vital that we begin to make the long-term investment in the protection and restoration of our forests that is necessary to secure their lasting value for future generations.

ACKNOWLEDGMENTS

The authors wish to thank the numerous scientists, practitioners, activists, and organizations that participated in the discussions, summit, workshop, and reviews of this manuscript. Many of the participating organizations are reflected in the authorship of this document, but there were others who participated but chose not to be included as authors.

REFERENCES

Agee, J. 2002. The fallacy of passive management: Managing for firesafe forest reserves. *Conservation Biology in Practice* 3(1):18-25.

Brown, R. 2000. Thinning, fire, and fore s t restoration: A science-based approach for national forests in the interior northwest. Washington, D.C.: Defenders of Wildlife. Center for Biological Diversity. 2002. The
community protection zone: Defending homes and communities from forest fires. Unpublished report.

Cohen, J.D. 2000. Preventing disaster: Home ignitability in the wildland-urban interface. *Journal of Forestry* March:15-21.

DellaSala, D.A., R.G. Anthony, T.A. Spies and K.A. Engel. 1998. Management of bald eagle roosts in fire adapted mixed-conifer f o rests. *Journal of Wildlife Management* 62(1):322-333.

DellaSala, D.A. and E. Frost. 2001. An ecologically based strategy for fire and fuels management in national forest ro a d l e s s areas. *Fire Management Today* 61(2):12-23.

DellaSala, D.A., N.L. Staus, J.R. Strittholt, A. Hackman and A. Iacobelli. 2001. An updated protected areas database for the United States and Canada. *Natural Areas Journal* 21:124-135.

DellaSala, D.A., J.R. Strittholt, R.F. Noss and D.M. Olson. 1996. A critical role for core reserves in managing inland northwest landscapes for natural resources and biodiversity. *Wildlife Society Bulletin* 24 (2):209-221. Firewise. 2001. Protecting your home from wildfire. www.firewise.org.

Heilman, G.E., Jr., J.R. Strittholt, N.C. Slosser and D.A. DellaSala. 2002. Forest fragmentation of the conterminous United States: Assessing forest intactness through road density and spatial characteristics. *BioScience* 52(5):411-422.

Higgs, E.S. 1997. What is good ecological restoration? *Conservation Biology* 11:338-348.

Karr, J.R. 2000. Health, integrity, and biological assessment: The importance of measuring whole things. Pages 209-236 *in* D . Pimentel, L. Westra and R.F. Noss (eds.), Ecological integrity: Integrating environment, conservation, and health. Washington, D.C.: Island Press.

Karr, J. R. and D. R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68.

Kauffman, J.B., R.L. Beschta, N. Otting and D. Lytjen. 1997. An ecological perspective of riparian and stream restoration in the western United States. *Fisheries* 22(5):12-24.

Kimmerer, R.W. 2002. Weaving traditional ecological knowledge into biological education: A call to action. *BioScience* 52(5): 432-438.

Noss, R.F. and A. Cooperrider 1994. *Saving nature's legacy.* Washington, D.C.: Island Press.

Pimentel, D., L. Westra and R. Noss, eds. 2001. *Ecological integrity: Integrating environment, conservation, and health.* Washington, D.C.: Island Press.

Power, T.M. 1996a. *Environmental protection and economic well-being: The economic pursuit of quality.* Armonk, New York: M.E. Sharpe.

__. 1996b. Wilderness economics must look through the windshield, not the rearview mirror. *Wilderness* 2(1):1-10.

Rasker, R. 1994. A new look at old vistas: The economic role of environmental quality in western public lands. *University of Colorado Law Review* 65(2):369-399.

Ricketts, T., E. Dinerstein, D. Olson, C. Loucks, W. Eichbaum, D. DellaSala, K. Kavanagh, P. Hedao, P. Hurley, K. Carney, R. Abell and S. Walters. 1999. *A conservation assessment of the terrestrial ecoregions of North America.* Washington, D.C.: Island Press.

Scott, J.M., F. Davis, B. Csuti, R. Noss, B. Butterfield, C. Groves, J. Anderson, S. Caicco, F. D'Erchia, T.C. Edwards, J. Ulliman and R.G. Wright. 1993. Gap analysis: A geographical approach to protection of biodiversity. *Wildlife Monographs* 123:1-41.

Dominick A. DellaSala, forest ecologist and director of the World Wildlife Fund, 116 Lithia Way, Suite 7 Ashland, OR 97520, 541/482-4878, Fax: 541/ 482-4895, dellasal@wwfks.org.

Anne Martin, national field director, American Lands, 152 South Oak St. Apt. 4, Spokane, WA 99204.

Randi Spivak, executive director, American Lands, 726 Seventh St. SE, Washington, DC 20003.

Todd Schulke, forest policy director, Center for Biological Diversity, P.O. Box 53102, Pinos Altos, NM 88053.

Bryan Bird, conservation biologist, Forest Conservation Council, P.O. Box 22488, Santa Fe, NM, 87502.

Marnie Criley, roads policy coordinator, Wildlands Center for Preventing Roads, P.O. Box 7516, Missoula, MT 59807.

Chris van Daalen, program coordinator, Alliance for Sustainable Jobs and the Environment, P.O. Box 2760, Olympia, WA 98507.

Jake Kreilick, campaign coordinator, National Forest Protection Alliance, P.O. Box 8264, Missoula, MT.

Rick Brown, senior resource specialist, Defenders of Wildlife, Willamette Falls Dr., Ste. 200, West Linn, OR 97068.

Greg Aplet, forest ecologist and director, Center for Landscape Analysis, The Wilderness Society, 7475 Dakin St., Suite 410, Denver, CO 80221.

Appendix: Ecological Forest Restoration Principles and Criteria Checklist Core Principle

1. Ecological Forest Restoration—Enhance ecological integrity by restoring natural processes and resiliency

Sub-principle and Criteria

1. Restoration Project Planning Principle—Document all restoration projects in the context of a restoration assessment and appropriate restoration approaches that restore ecological integrity

Restoration Planning Criteria

- Take a thoughtful, careful, and conservative approach.
- Use the best available science and incorporate experiential and indigenous knowledge where applicable.
- Make use of an adaptive and public process that regularly incorporates revisions from monitoring and evaluation.
- Prescriptions for active restoration must be clearly applied to those factors that are currently limiting ecosystem recovery and integrity. Priorities identified during the assessment should not be abandoned in order to meet other objectives not directly aimed at ecosystem integrity and resilience.
- Restoration treatments must use the least intrusive techniques that will be effective in order to avoid negative cumulative effects to watersheds and wildlife, except under special circumstances where a high level of intrusiveness is needed to restore ecological integrity (for example, road obliteration, see section IV, 2).
- Comply with and uphold all applicable local, state and federal laws and regulations. Incorporate and/or improve recovery plans for threatened and endangered species.
- Budgets must include realistic and dedicated funding for and an institutional commitment to assessment, monitoring and evaluation, with systems designed and in place before activities commence.
- Assess the work force and community capacity for carrying out restoration work, and recommend actions to meet Quality Jobs Criteria below.

2. Forest Restoration Assessment Principle—Conduct a restoration assessment prior to restoration activities

Ecoregional Level Assessment Criteria (Broad Scale Assessment)

- Use published ecoregional classifications to identify the eco-region within which the site occurs.
- Determine the status and condition of ecological integrity attributes across the ecoregion (for example, what are the major forest types or species in decline and what are the root causes of such declines?).
- Identify core refugia, landscape connectivity, and restoration are a s needed to maintain or restore integrity across the ecoregion.

Intermediate Spatial Scale Assessment Criteria

- Identify the specific unit used in an intermediate spatial assessment—the unit of analysis should be defined based on the integrity needs addressed (examples include landscape, watershed, subbasin, river basin, mountain range).
- Focus on extending high-integrity areas and connecting them at the intermediate scale, wherever connectivity was characteristic of the natural landscape as recognized by the ecoregional

assessment.

- Determine the need and efficacy for performing restoration objectives at intermediate spatial scales (for example, Are treatments needed at the scale of the landscape or is it best to start at some other unit?)
- Evaluate cumulative impacts and address how a site-specific project will affect ecological integrity at intermediate scales.

Site-Specific Assessment Criteria

- Determine the importance of the site within the larger landscape context.
- Identify the specific ecological processes, species, or functions at risk.
- Document the types of restoration treatments needed to maintain or restore ecological integrity.
- Establish clear links to the spatial and temporal issues identified in the ecoregional and intermediate assessments.
- Link site-specific information to the role the site plays in determining resiliency and integrity at the watershed, landscape and global scales.
- Determine the role that individual target sites play within the watershed or landscape based on conservation biology principles (for example, is an area an important corridor for wildlife, the only old-growth forest in the region, critical habitat for an area-limited species?).
- Evaluate cumulative impacts and address how a site-specific project will affect ecological integrity at broader scales.
- Evaluate the appropriate restoration methods (protection, passive, or active restoration) based on ecological need, importance of the site in the watershed or landscape, and the timing and resources needed to restore ecological integrity.
- Focus on projects with a high likelihood of successful ecological results and low risks or where risks of inaction jeopardize important ecological values of the site.
- Give consideration to areas of greatest need/areas where threats are the greatest.
- Give extra consideration to the presence of populations of at-risk species.
- Assessments must include data that indicate:
    1. Baseline (current) conditions.
    2. Associated ecological reference conditions (reference sites or ecological conditions that support[ed] native biodiversity and ecological processes) that account for resilient and dynamic systems (for example, flood- or wind-prone areas, areas experiencing population cycling and periodic fire events). Ecological reference conditions must inform restoration and are selected to define, achieve, and maintain ecological integrity.
    3. Control sites based on reference conditions or landscapes.

3. Ecological Restoration Approaches Principle—Determine the appropriate use of protection, passive and active restoration based on restoration assessments

Protection of Areas of High Ecological Integrity Criteria—Protect areas of high ecological integrity

- Identifying and protecting areas that currently exhibit high ecological integrity must be the first priority of restoration plans.
- Active restoration should not be applied in these areas unless it can be shown that there is a high degree of scientific and stakeholder support, and that there are no other means for restoring or maintaining ecological integrity.

Passive Restoration Criteria—Cease activities that have been determined by a restoration assessment to impede natural recovery processes

- Passive restoration should be employed in areas where removal of degrading activities will allow natural recovery to occur. Passive restoration can be employed alone, or prior to active restoration. Active restoration that fails to incorporate appropriate passive techniques is unlikely to succeed.

Active Restoration Criteria—Reintroduce natural processes or species through direct intervention

- Focus on areas of greatest risk to ecological integrity and processes.
- Implement in situations where inaction might lead to the d e s t ruction or loss of natural processes or permanent decline of a species, stream function, or rare habitat type, or where it can be

demonstrated that active restoration will greatly accelerate the re t u rn to a higher state of ecological integrity.

- Apply active restoration judiciously in areas of high ecological integrity based on degree of degradation and ecological need.
- Emphasize the least risky interventions that are likely to provide the greatest ecological benefit, while minimizing manage-ment-induced ecological risks and costs.
- Provide benefits in areas that exhibit moderate loss of ecological integrity but still support key ecological elements and processes.
- Incorporate appropriate passive techniques.

4. Community Protection Zone Principle—Distinguish between fuel-reduction treatments that restore ecological integrity and those that serve primarily to protect property and human life

CPZ Criteria

- Home-site treatments in the CPZ must be undertaken primarily within a 66-200 feet (20-60 meter) intensive treatment zone where fires most directly threaten structures and human life (Cohen 2000).
- Defensible community space that may include public and private lands should be created within an additional treatment zone up to 1667 feet (500 meters), which includes the 200foot (60 meter) home-site treatment zone, for firefighter safety and protection of other flammable community values (Center for Biological Diversity 2002).
- Treatments to create defensible space may include thinning small-diameter trees, pruning, mowing, roof cleaning, as well as replacement of flammable landscape and building materials (Cohen 2000, Firewise 2001).
- Home-site treatment is sufficient for survival of a home duringa forest fire. It is critical that these treatments be implemented for a CPZ protection plan to be successful. Priority should be given to home-site treatments when resources are limited. Federal cost-share grants for home-site treatment should be increased and maintained until a comprehensive program is completed.
- Long-term management of the community defensible space should be a cooperative partnership between the relevant agencies, communities, and homeowners beginning with the initial CPZ risk assessment and following through to future maintenance and should account for appropriate access to structures for fire fighting, fire-resistant landscaping, and consideration of construction standards and proper zoning laws for all land ownerships.

5. Adaptive Management Principle—Monitoring and evaluation must be assured before restoration proceeds, and be incorporated into the cost of the project

Monitoring and Evaluation Criteria

- Have clearly stated objectives, as well as specific indicators and measures for determining effectiveness.
- Be an integral component of the restoration project.
- Be incorporated into the essential costs of the project.
- Provide a process for all-party and scientific input.
- Compile data, models, and analyses related to ecological restoration efforts in comparable formats and collect them in a central location.
- Make data available to the public in a user-friendly format in both on-line and written display formats. Such information will indicate how data will be used in the restoration process.
- Require that project implementation promptly respond to monitoring and evaluation results, as well as new information. This may include adapting or altering implementation plans and/or taking corrective actions.
- Require that processes for carrying out assessments, planning, monitoring and evaluation of restoration efforts involve all local, regional, and national stakeholders.

II. Ecological Economics—Develop or make use of restoration incentives that protect or restore ecological integrity

6. Economic Framework Principle—Develop positive incentives to encourage ecologically sound restoration.

Economic Incentives Criteria

- Investments in restoring ecosystems should be applied across land ownerships in cooperation with willing landowners and should be tiered to regional and local ecological needs.
- Successful restoration on public lands requires reforming federal agency funding mechanisms and contracting procedures to remove incentives for ecologically and socially damaging activities. Such reforms should include the following:
  1. Specific appropriations must commit consistent, adequate multi-year funding for all aspects of restoration — assessment, implementation, monitoring, evaluation, and adaptive management.
  2. The current timber sale program continues to give priority to economic interests and is not appropriate for restoring forests. However, restoration byproducts derived from ecologically based restoration projects may have value secondarily. Contracting mechanisms, therefore, must be developed that are driven by ecological objectives.
  3. Contracts for restoration work on public lands must be awarded on "best value" rather than "lowest bid" criteria. Best value should be based on desired ecological, community, and work force objectives, which ensure contractors possess the necessary skills and capacities to carry out high-quality work, have successfully performed such work in the past, and provide social and economic benefits to communities.
  4. Preference for "best value" contracts on public lands should not exclude any business or group of persons, but should be given to local crews and small businesses, underserved communities, and mobile workers, who can demonstrate direct knowledge and experience of the ecosystem in which the work will be done. Procurement mechanisms should encourage contractors to include a training and employment component that will increase the capacity of existing displaced timber workers and mobile workers to access and perform high-skill, long-duration work. The Mobile Workforce consists of economically disadvantaged, under-represented and culturally diverse crews of migrant and community-based forest workers who perform services such as tree planting, thinning, brush disposal, prescribed burning, trail construction, and so on.
- For public lands, restoration funding should not include off - b u d-get funds generated from commercial activities.
- Restoration on private lands requires outreach to landowners with information about the ecological importance of their lands within the context of the larger landscape, and resources for technical and financial assistance to help landowners restore these lands.
  1. Private forestland owners should be encouraged (including financial support for small landowners) to pursue Forest Stewardship Council certification to promote sound forestry on private lands.
  2. Cooperative forestry programs should provide private forestland owners with access to education, training and incentives for participation in restorative forestry methods. Agencies must inform low-income and minority landowners of such opportunities.
  3. A low-interest, revolving loan fund should be established to cover upfront costs to encourage landowners to shift to longer timber rotations.
  4. Public funding sources and tax incentives for habitat restoration projects for threatened and endangered species and imperiled forest habitats should be established.
  5. Federal land and water conservation funds should be appropriated for the acquisition, protection, and restoration of priority habitats.

III. Communities and Work Force—Make use of or train a highly skilled, well-compensated work force to conduct restoration

7. Community/Work Force Sustainability Principle—Effective restoration depends on strong, healthy, and diverse communities and a skilled, committed work force

Sustainability Criteria

- Restoration and economic development must prioritize the long-term interests of communities over short-term and non-local economic interests.
- Government, interest groups, and communities should cooperate to promote policies and programs that build community capacity for ecologically sound restoration, including work force and small business development that:
    1. Are based on landscape-scale assessments of restoration needs, and are scaled appropriately within the carrying capacity of the land and regional economy.
    2. Have the flexibility to adapt over time to new information.
    3. Directly and proactively address barriers to equal access, such as differences based on class, culture, language, and religion.
    4. Provide for intergenerational exchange and other proactive strategies to engage and empower youth and elders.
    5. Are designed to add maximum value to restoration by-products at the community level.

Quality Jobs Criteria

- Restoration contracts should recognize and foster a multidisciplinary, high-skilled work force of trained, certified restoration technicians and applied ecologists, and provide stable, full-season employment. Restoration workers should be compensated with a family living wage at levels commensurate with their knowledge and skills, set as a functional minimum.
- Restoration must be supported by regional training and skill certification systems (for example, apprenticeship programs), with stable funding, that provide for multidisciplinary skill development to broaden career opportunities.
- Employment and training systems must be equally accessible to the existing diverse work force. Restoration contracts and regional training systems must be linked by recognized skill standards and associated wage and benefit standards.
- Contracting, employment, and training systems must promote the efficient and fair utilization of local, regional, and mobile workers in a way that most effectively meets ecological integrity as well as social goals.
- Restoration workers at all wage and skill levels must be guaranteed the right to organize and bargain collectively.

8. Participatory Principle—Encourage involvement of a diversity of communities, interest groups, agencies, and other stakeholders at all levels

Participatory Criteria

- Adaptive processes for carrying out assessments, planning, monitoring, and evaluation of restoration efforts on public lands should be "all-party" processes to the extent feasible; that is, open to and proactively inclusive of all stakeholders at local, regional, and national levels.
- No one interest or community should be aff o rded control of or undue influence on public-land management decision making.
- Adaptive all-party processes should strive to build consensus around ecological, social, and economic principles and practices by focusing on common values, mutual goals, and the resolution of conflicts based on class, culture, language, and religion.

APPENDIX B

"Complete List of Forest Service Authorizations"
(Adapted from the USDA Forest Service fiscal year 2006 Budget Justification)

AUTHORITIES

These laws authorize and/or provide guidance for the use of appropriations to the Forest Service.

RESEARCH

P.L. 78-425, Department of Agriculture Organic Act of September 21, 1944 (7 U.S.C. 2250). Section 703. Erect, alter, and repair buildings necessary to carry out authorized work.

P.L. 81-478, Granger-Thye Act of 1950, as amended (16 U.S.C. 581i-1) ch. 97, sec. 20 as added April 6, 1956, ch 177. Provides authority to advance funds to cooperators for cooperative research.

P.L. 85-934, Research Grants Act of 1958, as amended (42 U.S.C. 1891-1893). Provides, to agencies authorized to enter into contracts for basic scientific research with nonprofit institution and organizations, authority to make grants to such institutions and organizations; title to equipment purchased with such grants being vested with the nonprofit organization or institution. Such sums as are necessary; no expiration date.

P.L. 87-788, McIntire-Stennis Act of 1962, as amended by P.L. 101-624, Food, Agriculture, Conservation, and Trade Act of 1990 (Farm Bill), Title XII, Subtitle B, Chapter 1. (16 U.S.C. 582a, 582a-1--582a-7). Authorizes the Secretary of Agriculture to cooperate and assist State colleges and universities in forestry research on a matching funds basis. Authorizes the Secretary of Agriculture to make competitive grants to a State agriculture experiment station, college or university, research institution or organization, Federal agency, private organization, or corporation with the demonstrable capacity to conduct forestry, natural resource, and environmental research, and to update research facilities and equipment available for this type of research. Authorizes appropriations as necessary; no expiration date.

P.L. 88-74, 95-113, and 99-198, Research Facilities Act of 1963, as amended (7 U.S.C. 390). Authorizes support of agricultural (including forestry) research at eligible institutions through Federal grant funds, on a matching funds basis, to help finance facilities and equipment as required for the effective conduct of the research and related academic programs.

P.L. 89-106, 97-98 and 99-198, Agriculture Grants and Powers Act of 1965, as amended (7 U.S.C. 2250a, 7 U.S.C. 450i). Provides authority to erect buildings and other structures on non-Federal land, if long-term lease on the land is obtained. Also, includes authority to enter into a long-term lease on the land. Provides authority to make competitive grants to eligible institutions, including special grants and grants for facility renovation and refurbishment, to further the programs of the Department of Agriculture.

P.L. 93-378, Forest and Rangeland Renewable Resources Planning Act, August 17, 1974, as amended (16 U.S.C. 1601 note). Sections 2-5. Requires preparation of a renewable resource assessment, program plans, inventories, and budget request and update every five years. Such sums as appropriated; no expiration date.

P.L. 94-588, National Forest Management Act of 1976, October 22, 1976 (16 U.S.C. 472 (a-i) and 1601 (d)(3). Section 1-14. Amends Forest and Rangeland Renewable Resources Planning Act of 1974 and provides authority and requirements for the sale of timber on the National Forest System. Such sums as appropriated; no expiration date.

P.L. 95-113, Food and Agriculture Act of 1977 (Title XIV), as amended December 22, 1981, and as amended by The Food Security Act of December 23, 1985 (7 U.S.C. 3221, 3222, 3291, 3318-3319d). Provides for increased cooperation and coordination in the performance of agricultural research by Federal

departments and agencies, in the States, State agricultural experiment stations, colleges and universities, and other user groups (7 U.S.C. 1281). Authorizes the Secretary of Agriculture to engage in international agricultural research and extension, including to "assist the Agency for International Development with agricultural research and extension programs in developing countries."

P.L. 95-307, Forest and Rangeland Renewable Resources Research Act, June 30, 1978, as amended by P.L. 100-521, Forest Ecosystems and Atmospheric Pollution Research Act of 1988, Section 3 (c), and as amended by P.L. 101-624, Food Agriculture, Conservation, and Trade Act of 1990 (Farm Bill), Title XII, Subtitle B (16 U.S.C. 1641 et. seq.). Provides authority for competitive grants, research studies, wood fiber recycling, conducting tests, and establishing a forestry student grant program for minority and female students.

P.L. 101-513, Title VI, International Forestry Cooperation Act of 1990. Authorizes support (including cooperation and financial and technical assistance without reimbursement) for international forestry and related natural resource activities outside the United States and its territories and possessions; authorizes support of the Tropical Forestry Action Plan and activities specifically addressing tropical deforestation and degradation; authorizes expansion of the capabilities of the Institute of Tropical Forestry in Puerto Rico. Such sums as necessary; no expiration date.

P.L. 101-606, Global Change Research Act of 1990 (15 U.S.C. 2931). Establishes the Committee on Earth and Environmental Sciences, part of the Federal Coordinating Council on Science, Engineering, and Technology under the Office of Science and Technology Policy of the Executive Office of the President. Authorizes funded participation in the United States Global Change Research Program as the Forest Service Global Change Research Program.

P.L. 101-624, Food, Agriculture, Conservation, and Trade Act of 1990 (Farm Bill) Title XII, Subtitle B, Chapter 2; and Title XXIV (Global Climate Change Prevention Act of 1990); and Title XVI, Section 1608. Authorizes continuation of the Modern Timber Bridge Initiative, a grant to a State for the establishment of a Southern Forest Regeneration Center, establishment of a Semiarid Agroforestry Research, Development, and Demonstration Center at the Forest Service Forestry Sciences Laboratory in Lincoln, Nebraska, establishment of a Research and Demonstration Program for the forests and rangelands of Oregon and Washington east of the Cascades Crest, establishment of an International Forest Products Trade Institute and authority for the Secretary to make grants to land grant colleges and universities, and colleges and universities having significant minority enrollments and the demonstrable capacity to carry out the teaching of food and agricultural science (including forestry), for a period not to exceed 5 years.

P.L. 104-127, Federal Agricultural Improvement and Reform Act (April 4, 1996). Reauthorizes funding for FS Office of International Forestry through 2002.

P. L. 107-171, Farm Security and Rural Investment Act of 2002 Title VIII, Forestry, Section 8102, reauthorizes the Office of International Forestry within the Forest Service through fiscal year 2007.
P.L. 108-148, The Healthy Forests Restoration Act, December 3, 2003, a bill to improve the capacity of the Secretary of Agriculture and the Secretary of the Interior to conduct hazardous fuels treatment projects on National Forest and Bureau of Land Management lands aimed at protecting communities, watersheds and other at-risk lands from catastrophic wildfire.
- The bill amends previous Acts to encourage the use of Biomass technologies.
- Authority is granted to the Secretary of Agriculture to carry out silvicultural assessments and research projects under categorical exclusions for areas affected by insects and disease.

STATE & PRIVATE FORESTRY

Tribal

P.L. 106-511, Cheyenne River Sioux Tribe Equitable Compensation Act, November 13, 2000. Provides for equitable compensation for the Cheyenne River Sioux Tribe.

P.L. 108-7, February 20, 2003 Consolidated Appropriations Resolution of 2003. (Tu'f Shur Bien Preservation Trust Act) – Established preservation trust area on the Cibola National Forest and resolves claims by Pueblo Tribe.

P.L. 108-67, August 1, 2003, An Act to direct the Secretary of Agriculture to convey 24.3 acres in the Lake Tahoe Basin Management Unit located in Nevada to the Secretary of Interior in trust for the Washoe Indian Tribe of California and Nevada.

P.L. 108-278, July 22, 2004, Tribal Forest Protection Act, To authorize the Secretary of Agriculture and the Secretary of the Interior to enter into an agreement or contract with Indian tribes meeting certain criteria to carry out projects to protect Indian forest land.

WILDLAND FIRE MANAGEMENT

The Act of June 4, 1897, Organic Administration Act of 1897, as amended (16 U.S.C. 551). Directs the Secretary of Agriculture to make provisions for the protection against destruction by fire and depredations upon the public forest and national forests. No specific authority; no expiration date.

P.L. 101-121, The Department of Interior and Related Agencies Appropriations Act of 1990. Established a new appropriation for necessary expenses of firefighting, presuppression, and fuels management. No specific authority; to remain available until expended.

P.L. 102-154, The Department of Interior and Related Agencies Appropriations Act of 1992. Established separate appropriations for Forest Service Firefighting and Emergency Forest Service Firefighting.

P.L. 104-134, The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (April 26, 1996). Consolidated fire appropriations into a single fund, Wildland Fire Management

P.L. 105-277, The Department of Interior and Related Agencies Appropriations Act of 1999. Directs that moneys collected from States for fire suppression assisted rendered by the Forest Service on non-Federal lands not in the vicinity of National Forest System lands be used to reimburse appropriations originally used. Such moneys shall remain available until expended as the Secretary of Agriculture may direct in conducting activities authorized by 16 U.S.C. 2101 note, 2101-2110, 1606, and 211.

P.L. 107-13, authorize the Secretary of the Interior and the Secretary of Agriculture to use funds appropriated for wildland fire management in the Department of the Interior and Related Agencies Appropriations Act, 2001, to reimburse the United States Fish and Wildlife Service and the National Marine Fisheries Service to facilitate the interagency cooperation required under the Endangered Species Act of 1973 in connection with wildland fire management.

P.L. 108-83, September 30, 2003, Legislative Branch Appropriations Act, Authorizing expenditure of funds for hazardous fuel reduction and mitigation in Southern California.

P.L. 108-375, Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005, SEC. 354. Transfer of Excess Department of Defense Personal Property to assist Firefighting Agencies. Section 2576b of title 10, United States Code, is amended--(1) in subsection (a), by striking 'may' and inserting 'shall'; and(2) in subsection (b), by striking 'may' and inserting 'shall'. **Sec. 1086,** The Secretary of Agriculture is authorized to purchase 10 aircraft for the National Interagency Fire Center for use in aerial firefighting.

NATIONAL FOREST SYSTEM

General

The Act of June 4, 1897, Organic Administration Act of 1897, as amended (16 U.S.C. 473- 478, 479-482, 551). Section 24. Administration, protection, and management of the national forests. Such sums as appropriated; no expiration date.

P.L. 63-293, Use and Occupancy Permits Act of 1915, as amended. Issuance of permits for use and occupancy of suitable lands.

P.L. 78-412, Department of Agriculture Organic Act of September 21, 1944 (7 U.S.C. 2250). Section 703. Erect, alter, and repair buildings necessary to carry out authorized work.

P.L. 86-517, Act of June 12, 1960, 74 Stat. 215, Multiple-Use Sustained Yield Act of 1960 (16 U.S.C. 528-531). Authorizes and directs the Secretary of Agriculture to develop and administer the renewable surface resources of the National Forests for multiple use and sustained yield of the several products obtained there from.

P.L. 90-583, Carlson-Foley Act of 1968 (43 U.S.C. 1241-1243). Section 3. Authorizes reimbursement of States for noxious farm weed control on federal land. Such sums as appropriated; no expiration date.

P.L. 92-82, Sisk Act of August 10, 1971 (16 U.S.C. 551(a)). Authorizes cooperation with States and political subdivision for enforcement of State laws on national forest lands and reimbursement of expenses incurred for such activities. Such sums as appropriated; no expiration date.

P.L. 93-378, Forest and Rangeland Renewable Resources Planning Act, August 17, 1974, as amended (16 U.S.C. 1601 note). Sections 2-5. Requires preparation of a renewable resource assessment, program, plans, inventories, and budget request and update every 5 years. Such sums as appropriated; no expiration date.

P.L. 94-588, National Forest Management Act of 1976, October 22, 1976 (16 U.S.C. 472(a-i) and 1601(d)(3)). Sections 1-14. Amends; Forest and Rangeland Renewable Resources Planning Act of 1974, and provides authority and requirements for sale of timber on National Forest System lands. Such sums as appropriated; no expiration date. Reforestation $200 million annually (16 U.S.C. 1601(d)(3).

P.L. 99-570, Anti-Drug Abuse Act of 1986, Title XV, October 27, 1986, as amended by the Anti-Drug Abuse Act of 1988 (16 U.S.C. 559 b-f). Authorize Secretary of Agriculture to prevent and control drug abuse on the NFS lands, including investigative powers beyond the exterior boundaries of NFS lands. $10 million annually; no expiration date.

P.L. 103-66, Omnibus Budget Reconciliation Act of 1993, August 10, 1993, Title I, Subtitle D, Section 1401, Admission, entrance, and recreation fees. Title X, Section 10001-10003, Fees, Title XIII, Section 13982, Sharing of Forest Service Timber Sale Receipts. Gives the Secretary of Agriculture the authority to charge admission or recreation use fees at lands administered by the Secretary. (16 U.S.C. 460l-6c). Amends the L&WCF Act to allow the Secretary of Agriculture and the Secretary of Interior to withhold 15 percent of L&WCF receipts to cover fee collection costs, establishes commercial tour use fees, authorizes the sale of Golden Eagles Passports by private businesses and other organizations, and mandates a 10 percent increase in
communication site fees. (16 U.S.C 460). Sets out a schedule of 25-percent fund payments to states and counties affected by the northern spotted owl. (16 U.S.C 500 note.).

P.L. 104-106, National Defense Authorizations Act for Fiscal year 1996 (February 10, 1996). Established the Midewin National Tallgrass Prairie in Illinois, to be managed as part of the National Forest System.
P.L. 105-277, The Department of Interior and Related Agencies Appropriations Act of 1999. Authorizes the Forest Service to employ or contract with persons at regular pay rates to perform work caused by emergencies without regard to Sundays, Federal holidays, and the regular workweek. Authorizes the use of funds available to the Forest Service to disseminate program information to private and public individuals and organizations through the use of nonmonetary items of nominal value and to provide nonmonetary awards and incur necessary expenses for the recognition of private individuals and organizations making contributions to Forest Service programs.

P.L. 106-393, Oct. 30, 2000, The Secure Rural Schools and Community Self-Determination Act of 2000. To restore stability and predictability to the annual payments made to States and counties containing National Forest System lands and public domain lands managed by the Bureau of Land Management for use by the counties for the benefit of public schools, roads, and other purposes. The authority to initiate projects under this title shall terminate on September 30, 2006.

P.L. 107-76, Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations Act of 2002, for fiscal year ending September 30, 2002. For the purpose of making payments under section 102 of P.L. 106-393 (Act) to eligible States and eligible counties for fiscal years 2002 through 2006, as required by section 101(a)(1) of such Act, the Secretary of Agriculture shall revise the table referred to in subsection (a) to accurately reflect, to the maximum extent practicable, each eligible State's and eligible country's historic share of the 25 percent payments and safety net payments made for the fiscal years of the eligibility period.

P.L. 108-319, October 5, 2004, To extend the term of the Forest Counties Payments Committee until September 30, 2007.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004
Title II – Administrative Provisions, Funds may be used for the purpose of expenses associated with primary and secondary schooling for dependents of agency personnel stationed in Puerto Rico.

Facilities

P.L. 78-425, Department of Agriculture Organic Act of 1944 (7 U.S.C. 2250). Section 703. Erect, alter, and repair buildings and other improvements necessary to carry out authorized work, if provided for in applicable appropriation. Such sums as appropriated; no expiration date.

P.L. 88-657, Act of October 13, 1964, National Forest Roads and Trail Systems Act (16 U.S.C. 532-538); P.L. 85-767, Title 23, United States Code Highways (23 U.S.C. 205); P.L. 94-588, National Forest Management Act of 1976 (16 U.S.C. 472a); P.L. 93-378, Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, Section 10(a) (16 U.S.C. 1608). Acquisition, construction and maintenance of forest development roads and trails, and cooperation with States, counties, and other subdivisions. Construction of roads by timber purchasers, or election to have Forest Service build. Such sums as appropriated; no expiration date.

P.L. 89-106, The Act of August 4, 1965 (7 U.S.C. 2250a). Section 1. Authorizes expenditure of funds for erection of buildings and other structures, on non-federal lands, and for the acquisition of long term leases. Such sums as appropriated; no expiration date.

P.L. 89-665, Historic Preservation Act of 1966; P.L. 93-291, Preservation of Historical and Archaeological Data Act of 1974, and P.L. 96-95, P.L. 106-355 as amended to establish a national historic lighthouse preservation program. The Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. 469, 469a-1, 470a, 470f, 470h-2,470j, 470w-1, and 470aa-11). Authorizes use of appropriated funds for the preservation and protection of historical and archaeological resources. Such sums as necessary; no expiration date.

P.L. 95-307, Forest and Rangeland Renewable Resources Research Act, June 30, 1978, as amended (16 U.S.C. 1643(a)). Section 3. Construction and acquisition of research laboratories and facilities. Such sums as necessary; no expiration date.

P.L. 100-563, Act of October 31, 1988, Section 4. Strawberry Valley Land Compensation and Exchange. Provides for the exchange or sale of NFS lands, including any administrative sites and improvements thereon, described in subsection (h)(2). Acquisition of administrative sites and offices together with improvements thereon at either Provo, Utah County, Utah or near Heber City, Wasatch County, Utah. Sums collected are authorized for expenditure without further appropriation.

P.L. 107-63, Interior and Related Agencies Appropriation Act of 2002, Pilot Program Authorizing Conveyance of Excess Forest Service Structures – The Secretary of Agriculture may convey by sale or exchange title to excess buildings and other structures located on National Forest System Lands. Limited to no more than 10 sites, proceeds can be retained for maintenance and rehabilitation activities. Authority expires on September 30, 2005.

P.L. 108-108, Interior and Related Agencies Appropriation Act of 2004, Extends authority for Pilot Program Authorizing Conveyance of Excess Forest Service Structures to no more than 30 sites and extending expiration date to September 30, 2007.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004, Sec. 322, Extends authority until September 30, 2008 and increases number of projects to 40.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004
Title II – Administrative Provisions, For FYs 2005 and 2006, the Secretary may authorize the sale of excess buildings, facilities and other properties owned by the Forest Service and located on the Green Mountain NF and on the Wasatch-Cache NF's and retain revenues.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004
Title III – General Provisions, Sec. 335, Authorizes Secretary to convey small parcels of land and use the proceeds for critical San Bernardino NF infrastructure improvements or to acquire additional lands with the NF boundary.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004 Title III – General Provisions, Sec. 346, GSA is authorized to convey property in Sandpoint, ID to the Secretary of Agriculture for use as an administrative site or to sell, lease or exchange property and retain receipts.

Forest Health

P.L. 108-148, The Healthy Forests Restoration Act, December 3, 2003, An Act to improve the capacity of the Secretary of Agriculture and the Secretary of the Interior to conduct hazardous fuels treatment projects on National Forest and Bureau of Land Management lands aimed at protecting communities, watersheds and other at-risk lands from catastrophic wildfire.

P.L. 108-317, Southwest Forest Health and Wildfire Prevention Act of 2004, To establish Institutes to demonstrate and promote the use of adaptive ecosystem management to reduce the risk of wildfires, and restore the health of fire-adapted forest and woodland ecosystems of the interior West

Lands

P.L. 68-575, The Act of March 3, 1925, as amended (16 U.S.C. 555). Section 5. Purchase of land and acceptance of donations of land. Such sums as necessary, not to exceed $50,000 per

fiscal year; no expiration date.

P.L. 75-210, Title III, The Bankhead-Jones Farm Tenant Act of July 22, 1937, as amended (7 U.S.C. 1010, 1011). Sections 31 and 32. Land acquisition, exchange, and authorities to correct maladjustments for land utilization purposes. Such sums as necessary; no expiration date.

P.L. 84-979, The Department of Agriculture Organic Act of August 3, 1956 (7 U.S.C. 428a and (b)). Section 11. Authorizes acquisition of land or interests in land by purchase, exchange, or otherwise to carry out authorized work. Such sums specified by annual appropriation; no expiration date.

P.L. 97-465, Small Tracts Act of January 22, 1983 (16 U.S.C. 521(d)). Authorizes the conveyance of NFS lands of forty acres or less and of $150,000 or less in value. Such sums as necessary; no expiration date.

P.L. 100-409, Federal Exchange Facilitation Act of 1988, August 20, 1988 (43 U.S.C. 1716). Section 4. Funds to consider, process, and consummate land exchanges pursuant to the Federal Land Policy and Management Act of 1976. Amount not to exceed $4 million annually for fiscal years 1989 through 1998 for the Secretaries of Agriculture and Interior; no expiration date.

P.L. 103-16, Sioux Ranger District, Custer National Forest Boundary Exchange, 107 Stat. 49, April 12, 1993. Authorizes the Secretary of Agriculture to exchange lands within the Custer National Forest for certain lands which lie outside the proclaimed boundary of that Forest.

P.L. 103-17, State of Idaho, 107 Stat. 50, April 12, 1993. Provides for Forest Service land exchanges with the state of Idaho.

P.L. 103-46, Big Thicket National Preserve, 107 Stat. 1498, July 1, 1993. Adds acreage to the preserve and provides for land exchanges to increase the preserve.

P.L 103-48, In Lieu Lands, 107 Stat. 234, July 2, 1993. Resolves the status of the base lands for which "in lieu selections" were never completed.

P.L. 103-91, Gallatin Range Consolidation and Protection Act of 1993, 107 Stat. 987. Consolidates Federal and private land ownership in the Gallatin mountain range north of Yellowstone Park in southwestern Montana. Provides for land exchanges and acquisition.

P.L. 103-93, Utah Schools and Lands Improvement Act of 1993, 107 Stat. 995, October, 1, 1993. Authorizes the Secretary of Agriculture to accept land from the State of Utah in exchange for royalty receipts.

P.L. 103-132, Old Taos District Office and Warehouse, 107 Stat. 1371, November 2, 1993. Directs the Secretary to convey certain lands, the old Taos Ranger District Office and Warehouse, to the town of Taos, New Mexico for the sum of $360,000.

P.L. 103-450, Red Rock Canyon Conservation Area in Nevada, October 2, 1994, 108 Stat. 4766. Expands the conservation area and provides for land exchange.

P.L. 105-76, Boundary Adjustment and Land Conveyance, Raggeds Wilderness, White River National Forest, Colorado. Removes from the boundaries of the Raggeds Wilderness certain real property so as to permit the Secretary of Agriculture to use the authority of Public Law 977-465 (commonly known as the Small Tracts Act, 16 U.S.C. 521c) to convey the property to the landowners who occupied the property on the basis of erroneous land surveys.

P.L. 105-77, Inclusion of Dillon Ranger District in White River National Forest, Colorado. The distribution of receipts (16 U.S.C. 500) from the Arapaho National Forest and the White

River National Forest Forestry to the affected county governments shall be based on the national forest boundaries that existed on the day before the date of enactment of this Act.

P.L. 105-277, The Department of Interior and Related Agencies Appropriations Act of 1999. Authorizes the use of funds collected under the authority of section 101 of Public Law 93-153 (30 U.S.C. 185(1)) as reimbursements of administrative and other costs incurred for processing pipeline right-of-way permit applications and other selected costs associated with any pipeline and related facilities, to reimburse appropriations originally charged for such costs.

P.L. 106-66, Authorizes the Secretaries of Agriculture and the Interior to convey certain lands in San Juan County, New Mexico, to San Juan College.
P.L. 106-113, Consolidated Appropriations Act for FY 2000. Title II Sec. 331.(Enhancing Forest Service Administration of Rights-of-way and Land Uses.) The Secretary of Agriculture shall develop and implement a pilot program for the purpose of enhancing forest service administration of rights-of-way and other land uses. The authority for this program shall be for fiscal years 2000 through 2004.

P.L. 108-447, Consolidated Appropriations Act, 2005", December 8, 2004 Title III – General Provisions, Sec. 345, extends authorization until 2005.

P.L. 106-138, Terry Peak Land Transfer Act of 1999. Authorizes the Secretary of Agriculture to provide for the conveyance of certain National Forest System lands in the State of South Dakota.

P.L. 106-144, December 7, 1999. Direct the Secretary of Agriculture to convey to the city of Sisters, Oregon, a certain parcel of land for use in connection with a sewage treatment facility.

P.L. 106-187, (April 28, 2000) Authorizes the Secretary of Agriculture to convey certain National Forest lands to Elko County, Nevada, for continued use as a cemetery.

P.L. 106-206, May 26, 2000. Allows the Secretary of the Interior and the Secretary of Agriculture to establish a fee system for commercial filming activities on Federal land.

P.L. 106-257, Oregon Land Exchange Act of 2000, (August 8, 2000). To provide for the exchange of certain land in the State of Oregon.

P.L. 106-272, Jackson Multi-Agency Campus Act of 2000, (September 22, 2000). Authorizes the development and maintenance of a multi-agency campus project in the town of Jackson, Wyoming.

P.L. 106-283, Kake Tribal Corporation Land Transfer Act, (October 6, 2000). Authorize the reallocation of lands and selection rights between the State of Alaska, Kake Tribal Corporation, and the City of Kake, Alaska, in order to provide for the protection and management of the municipal watershed. To amend the Alaska Native Claims Settlement Act to provide for a land exchange between the Secretary of Agriculture and the Kake Tribal Corporation.

P.L. 106-329, Black Hills National Forest and Rocky Mountain Research Station Improvement Act (October 19, 2000). Authorizes the Secretary of Agriculture to sell or exchange all or part of certain administrative sites and other land in the Black Hills National Forest and to use funds derived from the sale or exchange to acquire replacement sites and to acquire or construct administrative improvements in connection with the Black Hills National Forest

P.L. 106-330, Texas National Forest Improvement Act of 2000, (October 19, 2000). Authorizes the Secretary of Agriculture to convey certain administrative sites for National Forest

System lands in the State of Texas, to convey certain National Forest System land to the New Waverly Gulf Coast Trades Center.

P.L. 106-425, Santo Domingo Pueblo Claims Settlement Act of 2000, November 1, 2000. To settle the land claims of the Pueblo of Santo Domingo.

P.L. 106-434, Nov. 06, 2000, provides for the conveyance of a small public domain land in the San Bernardino National Forest in the State of California, and for other purposes.

P.L. 106-458, Arizona National Forest Improvement Act of 2000, (November 7, 2000). Authorizes the Secretary of Agriculture to convey certain administrative sites in national forest in the State of Arizona, to convey certain land to the City of Sedona, Arizona for a wastewater treatment facility.

P.L. 106-558, Toiyabe National Forest Boundary Adjustment, to amend the National Forest and Public Lands of Nevada Enhancement Act of 1988 to adjust the boundary of the Toiyabe National Forest, Nevada, and to amend chapter 55 of title 5, U.S.C. to authorize equal overtime pay provisions for all Federal employees engaged in wildland fire suppression operations.

P.L. 108-152, December 3, 2003, Florida Lands Act. An Act to authorize the Secretary of Agriculture to sell or exchange certain National Forest System lands in the State of Florida.

P.L. 108-190, December 19, 2003, To provide for the exchange of certain lands in the Coconino and Tonto National Forests in Arizona.

P.L. 108-230, May 28, 2004, To require the conveyance of certain National Forest System lands in Mendocino National Forest, California, to provide for the use of the proceeds from such conveyance for National Forest purposes.

P.L. 108-269, July 2, 2004, To amend the Bend Pine Nursery Land Conveyance Act to direct the Secretary of Agriculture to sell the Bend Pine Nursery Administrative Site in the State of Oregon.

P.L. 108-279, July 22, 2004, To resolve boundary conflicts in Barry and Stone Counties in the State of Missouri.

P.L. 108-325, Craig Recreation Land Purchase Act, To authorize a land conveyance between the United States and the City of Craig, Alaska, and for other purposes.

P.L. 108-337, October 18, 2004, Alaska Native Allotment Subdivision Act, To authorize the subdivision and dedication of restricted land owned by Alaska Natives.

P.L. 108-338, October 18, 2004, To direct the Secretary of Agriculture to convey to the New Hope Cemetery Association certain land in the State of Arkansas for use as a cemetery.

P.L. 108-341, October 18, 2004, To transfer administrative jurisdiction of certain Federal lands in Missouri from the Secretary of the Interior to the Secretary of Agriculture for continued Federal operation of the Mingo Job Corps Civilian Conservation Center.

P.L. 108-346, October 18, 2004, Arapaho and Roosevelt National Forests Land Exchange Act of 2004, To direct the Secretary of Agriculture to exchange certain lands in the Arapaho and Roosevelt National Forests in the State of Colorado.

P.L. 108-350, October 21, 2004, To authorize the Secretary of Agriculture to sell or exchange all or part of certain administrative sites and other land in the Ozark-St. Francis and Ouachita National Forests and to use funds derived from the sale or exchange to acquire, construct, or

improve administrative sites.

P.L. 108-367, October 25, 2004, To Expand the Boundaries of Fort Donelson National Battlefield, The Secretary of Agriculture and the Secretary of the Interior shall enter into a memorandum of understanding to facilitate cooperatively protecting and interpreting the remaining vestige of Fort Henry and other remaining Civil War resources in the Land Between the Lakes National Recreation Area affiliated with the Fort Donelson campaign.

P.L. 108-381, October 30, 2004, To provide for the conveyance of several small parcels of National Forest System land in the Apalachicola National Forest, Florida, to resolve boundary discrepancies involving the Mt. Trial Primitive Baptist Church of Wakulla County, Florida, and for other purposes.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004 Title III – General Provisions, Sec. 342, The Secretary is authorized to convey in fee simple without compensation, of Federal land comprising approximately .29 acres to the Community of Elfin Cove, Alaska

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004 Title III – General Provisions, Sec. 347, The Secretary may carry out the exchange agreement entered into by the Forest Service and the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida, dated March 5, 2004.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004 Title III – General Provisions, Sec. 349, (Montana Forests Boundary Adjustment Act of 2004), The boundaries of NF's in Montana are adjusted.

Minerals

U.S. Mining Laws Act of May 10, 1872, as amended (30 U.S.C. 22, 28). Governs mining activities for valuable minerals on public domain lands.

P.L. 80-291, Mineral Materials Act of 1947, as amended (30 U.S.C. 226, 601-602, and 611). Dispose of mineral materials. Issue permits for oil and gas exploration.

P.L. 84-375, Act of July 23, 1955, 69 Stat. 367; P.L. 100-203 Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 226 and 601). Authority to dispose of mineral material, and approve and issue permits to explore and develop oil and gas leases. No specific sums; no expiration date.

Recreation/Trails/Rivers

P.L. 88-578, Land and Water Conservation Fund Act, as amended by the Omnibus Budget Reconciliation Act of 1993 (16 U.S.C. 460l-6a(i)(1)(B)). Authorizes retention of up to 15% of fees collected for admission and use of recreation areas to cover the cost of collecting the fees. Sections referring to fees repealed with P.L. 108-447, Consolidated Appropriations Act, 2005", (Div J, Title VIII – Federal Lands Recreation Enhancement Act), December 8, 2004. P.L. 88-657, Act of October 13, 1964, National Forest Roads and Trails Systems Act (16 U.S.C. 532-538). Sections 1-7. Authorizes acquisition, construction, and maintenance of forest roads and trails. Such sums as appropriated; no expiration date.

P.L. 90-543, National Trails System Act, October 2, 1968, as amended by P.L. 98-11 (16 U.S.C. 1241-1251). Sections 7 and 10. Land acquisition, exchange, donation. Management, development and volunteer assistance of the national trails system. Section 10. Authorizes administration, development, and maintenance of national trails; assistance to and from volunteer organizations and volunteers. Such sums as appropriated; no expiration date.

P.L. 90-542, Wild and Scenic Rivers Act of October 2, 1968 (16 U.S.C. 1271-1287). National wild and scenic rivers system components. Such sums as appropriated; no expiration date.

P.L. 95-495, Act of October 21, 1978 (92 Stat. 1649). Sections 18(e). Construction of dispersed recreation sites and trails outside the Boundary Waters Canoe Area Wilderness. Such sums as necessary; no expiration date.

P.L. 101-612, Smith River National Recreation Area Act, November 16, 1990. Established the Smith River National Recreation Area in northern California. Authorized entitlement payments to counties within the NRA, for a period of 12 years whenever the annual payment to the State of California pursuant to 16 U.S.C. 500 for the benefit of the counties falls below the average payment over a specified 5-year period.

P.L. 103-63, Spring Mountains National Recreation Area Act of October 26, 1993. Establishes a 316,000 acre National Recreation Area within the Toiyabe National Forest. Section 7 authorizes land acquisition.

P.L. 103-104, Jemez National Recreation Area Act of October 12, 1993. Establishes a 57,000 acre National Recreation Area within the Santa Fe National Forest. Section 5(b)(1) authorizes land purchase.

P.L. 84-375, Act of July 23, 1955, 69 Stat. 367; P.L. 100-203 Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 226 and 601). Authority to dispose of mineral material, and approve and issue permits to explore and develop oil and gas leases. No specific sums; no expiration date.

Timber/Vegetation

P.L. 81-348, Act of October 11, 1949, Anderson-Mansfield Reforestation and Revegetation Act, (16 U.S.C. 581j-k). Sections 1 and 2. Authorizes funding to provide for reasonable continuity of reforestation and range revegetation programs. Authorize acquisitions of land for nurseries. Such sums as needed; no expiration date.

P.L. 101-626, Tongass Timber Reform Act, January 23, 1990, 104 Stat. 4426 (16 U.S.C 539d-e,1132). Amended the Alaska National Interest Lands Conservation Act, to protect certain lands in the Tongass National Forest in perpetuity, to modify certain long-term timber contracts, to provide for protection of riparian habitat, and for other purposes.

Presidential Proclamation, Giant Sequoia in National Forests, July 14, 1992. Directs the Secretary of Agriculture to delineate the boundaries of Giant Sequoia groves on the Sequoia, Sierra, and Tahoe National Forests. Provides that designated groves will not be managed for timber production or included in the land base used to establish allowable sale quantities for the affected national forest.

P.L. 103-443, Timber Sale Receipts (November 2, 1994). Authorizes and directs payment of the Northern Spotted Owl Guarantee from any moneys in the Treasury not otherwise appropriated.

P.L. 104-134 The Omnibus Consolidated Rescissions and Appropriations Act of 1996 (April 26, 1996). Established new accounts, Timber Sales Pipeline Restoration Funds, for Interior and Agriculture for deposit of a portion of receipts from certain timber sales to be used for preparation of additional timber sales which are not funded by annual appropriations, and for

the backlog of recreation projects. Permanent Appropriation; termination date to be determined by the Secretaries under provisions of the Act.

Watershed

P.L. 95-200, November 23, 1977, to provide improved authority for the administration of certain national forest system lands in Oregon. Establishes the Bull Run Watershed Management Unit within the Mount Hood National Forest, Oregon, to be administered by the Secretary of Agriculture.

P.L. 96-586, Act of December 23, 1980. Section 2(h). Prevent, control, and mitigate water pollution, and manage NFS lands within the lake Tahoe Basin. Authorizes 5 percent of the L&WCF appropriation for Lake Tahoe Basin land acquisition each year. Expires when all Clark County, Nevada, land specified in the act is sold by the U.S. Department of Interior, BLM.

P.L. 102-338, Zuni River Watershed Act of 1992, August 11, 1992. Authorizes Secretary of Agriculture to conduct a study and prepare a plan for watershed protection and rehabilitation of the portion of the Zuni River Watershed that is upstream from the Zuni Indian Reservation on both public and private lands. Such sums as necessary; no expiration date.

P.L. 106-506, Lake Tahoe Restoration Act (November 13, 2000). To promote environmental restoration around the Lake Tahoe basin.

P.L. 107-30, August 20, 2001, to provide further protections for the watershed of the Little Sandy River as part of the Bull Run Watershed Management Unit, Oregon.

Wilderness

P.L. 95-495, Boundary Waters Canoe Area Wilderness (BWCAW) Act of October 21, 1978 (92 Stat. 1649), Section 11(f) and 18(e). Authorizes appropriations for acquisition of minerals and mineral rights, and expansion of dispersed recreation outside the BWCAW. Such sums as necessary; no expiration date.

P.L. 105-75, Slate Creek Addition to Eagles Nest Wilderness, Arapaho and White River National Forests, Colorado. Provides for the expansion of the Eagles Nest Wilderness within the Arapaho National Forest and the White River National Forest, Colorado to include land known as the Slate Creek Addition.

P.L. 106-156, Dugger Mountain Wilderness Act of 1999, (December 9, 1999). To designate certain Federal lands in the Talladega National Forest in the State of Alabama as the Dugger Mountain Wilderness.

P.L. 106-456, Spanish Peaks Wilderness Act of 2000, (November 7, 2000). Designate certain land in the San Isabel National Forest in the State of Colorado as the "Spanish Peaks Wilderness".

P.L. 106-471, November 9, 2000, to designate certain National Forest System lands within the boundaries of the State of Virginia as wilderness areas.

P.L. 108-95, October 3, 2003, Mt Naomi Wilderness Act An Act to make certain adjustments to the boundaries of the Mount Naomi Wilderness Area which is located in the State of Utah.

LAND ACQUISITION

P.L. 61-435, Weeks Act, March 1, 1911, as amended by P.L. 94-588 (16 U.S.C. 516, 521b).

Sections 1 and 2. Land acquisition for watershed protection and timber production. Such sums as necessary; no expiration date.

P.L. 733, Superior National Forest, Minnesota Act of June 22, 1948 (16 U.S.C. 577h). Purchase and condemnation of lands in northern Minnesota.

P.L. 76-589, 76-591, and 78-301 (54 Stat. 297 and 299 and 58 Stat. 227) Land acquisition for watershed protection and timber production within the exterior boundaries of the Cache, Uinta, Wasatch National Forest, Utah; the Toiyabe National Forest, Nevada; and the Angeles San Bernardino, Sequoia, and Cleveland National Forests, California. Toiyabe -$10,000 annual limit. Other such sums as available from the receipts of each national forest as appropriated; no expiration date.

P.L. 84-950, Department of Agriculture Organic Act of 1956 (7 U.S.C. 428a(a)). Acquisition of land by purchase, exchange or otherwise, to carry out authorized work, provided that provision therefore is made in applicable appropriation. Such sums as necessary; no expiration date.

P.L. 88-577, Wilderness Act, September 3, 1964. Sections 5 and 6 (16 U.S.C. 1121(note), 1131-1136). Land acquisition, exchange, donation for wilderness purposes. Such sums as appropriation; no expiration date.

P.L. 88-578, Land and Water Conservation Fund Act of 1965, as amended (16 U.S.C. 4601-4 to 4601-11). Acquisition of lands and other purposes.

P.L. 90-171, Act of December 4, 1967, Land Exchanges in the National Forests, as amended (16 U.S.C. 484a). Acquisition of lands to complete land exchange with public schools and State and local governments. Such sums as appropriated; no expiration date.

P.L. 90-542, Wild and Scenic Rivers Act, October 2, 1968. Sections 6 and 16 (16 U.S.C. 1277). Land acquisition, exchange, donation of land for inclusion in wild and scenic rivers system. Such sums as appropriated; no expiration date.

P.L. 90-543, National Trails System Act, October 2, 1968, as amended by P.L. 98-11 (16 U.S.C. 1241-1251). Sections 7 and 10. Land acquisition, exchange, donation of land for inclusion in the national trails system. Such sums as appropriated; no expiration date.

P.L. 93-205, Endangered Species Act, December 28, 1973. Sections 5 and 15. (16 U.S.C. 1534 and 1542) Acquisition for protection of threatened and endangered species. Such sums as necessary; no expiration date.

P.L. 93-622, Eastern Wilderness Act, January 3, 1975. Sections 6 and 9. (16 U.S.C. 1132 (note)). Land acquisition, exchange, donation of land for wilderness purposes. Such sums as appropriated; no expiration date.

P.L. 95-442, Act of October 10, 1978 (7 U.S.C. 2269). Donations of land or interests in land. Such sums as necessary; no expiration date.

P.L. 95-495, the Boundary Waters Canoe Area Wilderness Act of October 21, 1978. Section 7(d)(3). For the acquisition of lands and waters within the designated wilderness. Such sums as may be necessary; no expiration date.

P.L. 96-586, Lake Tahoe Basin Act, December 23, 1980. Sections 2 and 3. Land acquisition in the Lake Tahoe Basin. Such sums as appropriated; no expiration date.

P.L. 99-663, Columbia River Gorge National Scenic Area Act, November 17, 1986, Columbia River Gorge National Scenic Area Act of November 17, 1986. Authorizes

assistance to the Columbia Gorge Commission. Authorizes operation and maintenance of facilities included in the recreation assessment on non-federal lands. Provides for the completion of a resource inventory for the special management areas including private lands. Provides for the payment of $5,000,000 each to the States of Oregon and Washington for use by the States to make grants and loans for economic development projects. Provides for technical assistance to States and others. Provides for payments to counties in connection with the acquisition of lands or interests therein in an amount equal to one percent of the fair market value on the date of acquisition. $40 million; no expiration date.

P.L. 102-220, Greer Spring Acquisition and Protection Act of December 11, 1991. Section 2. Authorizes and directs the Secretary of Agriculture to acquire land from willing seller in Denning tract within the Mark Twain National Forest of Missouri. Authorizes such sums as necessary; no expiration date. Additional authorities are provided in each of the acts establishing national recreation areas and wilderness in other specific laws.

P.L. 108-108, November 10, 2003, The Department of the Interior and Related Agencies Appropriations Act. Title III, Sec 333. The Secretary of Agriculture is authorized to transfer to a Special Account receipts from timber sales, land conveyances, land acquisition funds and excess receipts to be expended for the completion of land acquisitions authorized under the Gallatin Land Consolidation Act of 1998. The Special Account shall be closed at the end of FY 2008.

PERMANENT APPROPRIATIONS

P.L. 62-430, Act of March 4, 1913 (16 U.S.C. 501) (Department of Agriculture Appropriations Act). Forest Road and trail improvements--10 percent financed from National Forest receipts. Permanent appropriations; no expiration date.

P.L. 64-190, Act of August 11, 1916 (Department of Agriculture Appropriations Act), as amended (16 U.S.C. 490). Section 6. Disposal of brush and other debris due to timber sales in national forests. Permanent appropriations; no expiration date.

P.L. 82-359, Act of May 23, 1952, as amended (16 U.S.C. 580p-2; 18 U.S.C. 711). Section 3. Forest fire prevention campaign (Smokey Bear). Permanent appropriations; no expiration date.

P.L. 84-979, Department of Agriculture Organic Act of 1956, as amended by the Act of October 23, 1962 (16 U.S.C.579b). To provide services to Forest Service programs through use of a revolving fund. Such sums as are available; no expiration date.

P.L. 85-464, Act of June 20, 1958 (16 U.S.C. 579C). Section 7. Restoration, improvements, and protection of Forest Service lands. Permanent appropriations; no expiration date.

P.L. 93-318, Act of June 22, 1974, as amended (16 U.S.C. 580p--p-4; 18 U.S.C. 711, 711a; and 31 U.S.C. 488a, 4886-3--4886-6). Section 1-6. Woodsy Owl antipollution campaign. Permanent appropriations; no expiration date.

P.L. 94-579, Federal Land Policy and Management Act of 1976; (43 U.S.C. 1751), as amended by P.L. 95-514, Public Rangelands Improvement Act of 1978 (43 U.S.C. 1751(b)(1). Authorizes appropriation of one-half of grazing receipts from national forest in the 16 Western States for range rehabilitation, protection, and improvements on the national forests from which collected. One-half of grazing receipts per annum; no expiration date.

P.L. 94-588, National Forest Management Act of 1976, October 22, 1976 (16 U.S.C. 472(h) and (i). Section 14(h) and (i). Timber salvage fund for harvesting insect infested, dead, and damaged trees. Section 472a(h). Timber purchaser roads constructed by the Forest Service.

Section 472a(i). Permanent appropriations; no expiration date.

P.L. 98-473, Title 1, Continuing Appropriations Act of 1985, Interior and Related Agency Appropriations, Title III (98 Stat. 1874; 5 U.S.C. 5911 as amended). Section 320. Fund for the operation and maintenance of Forest Service quarters. Permanent appropriations; no expiration date.

P.L. 101-335, Pacific Yew Act, Act of August 7, 1992. Provides for the management of Federal lands containing the Pacific Yew to ensure a sufficient supply of taxol, a cancer treatment drug made from the Pacific Yew. Authorizes the use of amounts received from the sale of Pacific Yew to pay the costs incurred by the Secretary (Agriculture and/or Interior) associated with the harvest and sale of Pacific Yew. Permanent appropriations; no expiration date.

COOPERATIVE WORK

Various Public Laws including the Act of June 30, 1914, Cooperative Funds Act, as amended; and 7 U.S.C. 2269; 16 U.S.C. 471h, 498, 572, 535, 537, 693d, and 1643c. Cooperative work (trust fund) for investigation, protection, and improvement of national forests. No expiration date.

P.L. 71-319, Act of June 9, 1930, Knutson-Vandenberg Act, as amended (16 U.S.C. 576b). Section 3. Funds deposited by timber sale purchasers to cover the cost of reforestation, timber stand improvements, and special cultural measures to improve renewable resources on timber sale areas. No expiration date.

P.L. 94-148, December 12, 1975, An Act to authorize Secretary of Agriculture to enter into cooperative agreements with public or private agencies, organizations, institutions, or persons for various purposes. P.L. 107-63, Interior and Related Agencies Appropriations for 2002, Title III, Sec. 328, Granting authority to the Secretary of Agriculture to enter into cooperative agreements under P.L. 94-148 for a purpose which includes the authority to use that legal instrument when the principal purpose is to the mutually significant benefit of Forest Service and other parties. Expires September 30, 2003. P.L. 108/7, Consolidated Appropriations Resolution for 2003, extends authority until September 30, 2005.

P.L. 95-192, Soil and Water Resources Conservation Act of 1977 (16 U.S.C. 2008). Cooperation in soil and water resource appraisal and conservation.

P.L. 95-313, Cooperative Forestry Assistance Act of 1978, July 1, 1978 (16 U.S.C. 2101-2110). Sections 3 and 5-18, as amended by P.L. 101-624, the Food, Agriculture, Conservation, and Trade Act of 1990, Title XII, Subtitles A, B, and C, sections 1265 and 1266; as amended by P.L. 101-513, Title VI, the International Forestry Cooperation Act of 1990. Authorizes cooperation and assistance to non-federal forest landowners in rural forest management, urban and community forest , establishes a forest stewardship program to assist non-industrial private forest landowners, establishes a forest legacy program and authorizes the acquisition of land, including conservation easements and rights of public access, authorizes financial assistance to State Foresters, and private forestry and other organizations to monitor forest health, authorizes cost share assistance to States to implement an integrated pest management strategy, authorizes an urban and community forest resources education and technical assistance program; a competitive Challenge Cost-share program for urban and community forestry projects; a Forestry Advisory Council, authorizes financial, technical, and related assistance to State Foresters and authorizes cooperative forestry assistance to foreign countries.

P.L.96-451, Act of October 14, 1980, Reforestation Trust Fund, as amended (16 U.S.C. 1606 a(d). Section 303. Establishment of Reforestation Trust Fund to be held by the Secretary of

Treasury. Funds to be invested and provided to the secretary of Agriculture based on an estimated fiscal year need necessary to accomplish the treatment of acreage in the reforestation program. Such sums as are necessary, but not more than $30 million annually, from custom tariffs: no expiration date.

P.L. 99-198, Food Security Act of 1985. (99 Stat. 1354, Title XII, Section 1231-1236) Conservation acreage reserve. Such sums as may be necessary; no expiration date specified.

P.L. 101-624, Food, Agriculture, Conservation, and Trade Act of 1990 (Farm Bill) Title XII, Subtitle B, chapter 2, Sec. 1244; Subtitle C (America the Beautiful Act of 1990), and Subtitle D; and Title XXIII, Subtitle G, Chapter 2 (National Forest-Dependent Rural Communities Economic Diversification Act of 1990) and (d) Title XXIV, Sec. 2409. Authorizes continued support for the study of changing landownership patterns in the northern forestlands of Maine, New Hampshire, Vermont, and New York. Authorizes $250,000 for the study of the New York-New Jersey Highlands. Authorizes designation of a private non-profit Tree Planting Foundation to provide grants and promote awareness, volunteerism, and encourage tree planting projects in communities and urban areas. Authorizes assistance to landowners who suffer destruction of 35 percent or more of a commercial tree stand due to damaging weather, related conditions, or wildfire. Authorizes assistance to rural communities in or near national forests; establishment of rural forestry and economic diversification action teams; and loans to economically disadvantaged rural communities. Authorizes an amount not to exceed 5 percent of receipts from sales of timber and other forest products and user fees, plus additional sums as necessary; as provided for in Appropriation Acts. No expiration date.

P.L. 102-381, The Department of Interior and Related Agencies Appropriation Act of 1993. Provides for contingency funds necessary for emergency suppression of pests, provided these funds shall be available only to the extent that the President notifies the Congress of his designation of these amounts as emergency requirements under the Balanced Budget and Emergency Deficit Control Act of 1985.

P.L. 103-115, National Forest Dependent Rural Communities Economic Diversification Act Amendment, 107 Stat. 1117, October 26, 1993. Amends the definition of rural community for eligibility for economic recovery funds. P.L. 103-427, Timber-Dependent Communities: Financial Assistance, October 31, 1994, 108 Stat. 4373. Expands the definition of rural community and places the forestry incentives program under the new Natural Resources Conservation Service.

P.L. 103-82, National and Community Service Act of September 21, 1993, 107 Stat. 785, (42 U.S.C 12501, 12572-12681). Authorizes the Secretary to enter into contracts or cooperative agreements with any qualified youth or conservation corps for completion of conservation work.

P.L. 103-106, National Forest Foundation Act of October 3, 1993, 107 Stat. 102, (16 U.S.C. 583j-3). Amends the National Forest Foundation Act (P.L. 101-593) to authorize start-up funds and matching funds for the National Forest Foundation for project expenses.

P.L. 104-127, Federal Agricultural Improvement and Reform Act (April 4, 1996). Authorizes optional State grants for Forest Legacy Program. Establishes a Water Rights Task Force and stipulates an 18-month moratorium on bypass flow decisions.

P.L. 105-83, Interior and Related Agencies Appropriation Act of 1998. Title III, Sec. 334. (Wyden Amendment) Watershed Restoration and Enhancement Agreements. Appropriations for Secretary of Agriculture may be used for the purpose of entering into cooperative agreements and use with heads of other Federal agencies, tribal, State and local governments, private and nonprofit entities and landowners for the protection, restoration, and enhancement of fish and wildlife habitat on public or private land. Expires at end of FY 1998.

P.L. 105-277, Omnibus Appropriations Act for 1999, Title III, Sec 323. Extends authority for Secretary of Agriculture to use funds for Watershed Restoration and Enhancement Agreements for fiscal years 1999-2001.

P.L. 107-63 Interior and Related Agencies Appropriations for 2002, Title III, Sec 330, Extends authority for Secretary of Agriculture to use funds for Watershed Restoration and Enhancement Agreements for fiscal years 2002 through 2005.

P.L. 105-83, The Department of Interior and Related Agencies Appropriations Act of 1998. Authorizes the Secretary of Agriculture to enter into grants, contracts, and cooperative agreements as appropriate with the Pinchot Institute for Conservation, as well as with public and other private agencies, organizations, institutions and individuals, to provide for the development, administration, maintenance, or restoration of land, facilities, or Forest Service programs, at the Grey Towers National Historic Landmark and subject to such terms and conditions as the Secretary of Agriculture may prescribe, any such public or private agency, organization, institution, or individual may solicit, accept, and administer private gifts of money and real or personal property for the benefit of, or in connection with, the activities and services at the Grey Towers National Historic Landmark and such gifts may be accepted notwithstanding the fact that a donor conducts business with the Department of Agriculture in any capacity. (Subject to permanent legislation or inclusion in the current year's annual appropriations act.)

P.L. 105-83, The Department of Interior and Related Agencies Appropriations Act of 1998. Authorizes the National Forest Foundation to invest Federal funds not needed for immediate disbursements in interest bearing obligations of the United States.

P.L. 105-277, Omnibus Appropriations Act of 1999. October 19, 1998 Section 401 (Quincy Library Group Forest Recovery Act.) Directs the Secretary of Agriculture to conduct a Pilot Project that demonstrates the management activities championed by the Quincy Library Group for a period of five years. P.L. 108-7 Consolidated Appropriations Resolution Act of 2003, Extends expiration date by five years.

P.L. 105-277 Omnibus Appropriations Act of 1999, (Stewardship Contracting) Authorizes the Forest Service to enter into no more than 28 contracts with private persons and entities to perform services to achieve land management goals for the National Forests that meet local and rural community needs. Expires September 30, 2002. P.L. 107-63, Title III, Sec 332, Extends Authority to September 30, 2004 and to an additional 28 contracts. P.L. 108-7 February 20, 2003, Joint Resolution Making Consolidated Appropriations for 2003. Title III, Sec. 323 Amends P.L. 105-277 Sec 323 to extend authority for stewardship contracting until September 30, 2013.

P.L. 106-291, Title III, Section 331 of the Fiscal Year 2001 Interior and Related Agencies Appropriation Act. (Colorado Good Neighbor) Authority allows for the Secretary of Agriculture, via cooperative agreement or contract to permit the Colorado State Forest Service to perform watershed restoration and protection services on National Forest System lands in the State of Colorado when similar and complementary watershed restoration and protection services are being performed by the State Forest Service on adjacent State or private lands. The types of services include treatment of insect infected trees, reduction of hazardous fuels, and other activities to restore or improve watersheds or fish and wildlife habitat across ownership boundaries. NEPA responsibilities for National Forest System lands are retained by the Forest Service. Authority expires on September 30, 2004.P.L. 108-447, Consolidated Appropriations Act, 2005", December 8, 2004, General Provisions Title III, Sec. 336, Extends authority for P.L. 106-291 until September 30, 2009.

P. L. 107-171, Farm Security and Rural Investment Act of 2002 Title VIII, Repeals the Forestry Incentives and Stewardship Incentives Program, establishes the Forest Land Enhancement Program (FLEP) to provide financial, technical, educational and related assistance to State Foresters to assist private landowners in managing their land. The Secretary shall use

$100,000,000 of Commodity Credit Corporation funds to carry out the program through September 30, 2007. Authorizes the Forest Service to cooperate with State Foresters in the management of lands to (1) promote optimal firefighting efficiency at the Federal, State and local levels; (2) expand outreach and education programs to homeowners and communities about fire protection; and (3) establish defensible space around homes and property against wildfire. The Secretary, in consultation with State Foresters and with the consent of private landowners, may undertake specified activities on non-Federal lands to further these purposes.

P.L. 108-148, The Healthy Forests Restoration Act, December 3, 2003, An Act to improve the capacity of the Secretary of Agriculture and the Secretary of the Interior to conduct hazardous fuels treatment projects on National Forest and Bureau of Land Management lands aimed at protecting communities, watersheds and other at-risk lands from catastrophic wildfire

- The Act grants authorities to the Secretary of Agriculture to work with states and colleges to address watershed issues on non-federal lands and establish a cost share fund.
- The Act directs Secretary of Agriculture to establish a watershed forestry program in cooperation with Indian tribes and provide assistance to tribal lands.
- The Secretary of Agriculture is directed to establish a healthy forests reserve program for private lands and an inventory and monitoring program on federal and state lands.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004, General Provisions Title III, Sec. 337 (Utah Good Neighbor), The Secretary may permit the State Forester of the State of Utah to perform forest, rangeland and watershed restoration services on NF system lands in the State of Utah until September 30, 2006.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004, General **Provisions Title III, Sec. 341,** The Secretary is authorized to make grants to the Eastern Nevada Landscape Coalition for the study and restoration of rangeland and other lands in Nevada's Great Basin.

P.L. 108-447, Consolidated Appropriations Act, 2005, December 8, 2004
Title III – General Provisions, Sec. 348, Authorizes Secretary to further the scientific, policy analysis, educational and cultural programs in natural resource conservation at Grey Towers.

EXPIRING AUTHORITIES

The following authorities will expire in either FY 2005 or FY 2006.

P.L. 105-83, Interior and Related Agencies Appropriation Act of 1998. Title III, Sec. 334. Watershed Restoration and Enhancement Agreements.--For fiscal year 1998, appropriations for the Forest Service may be used by the Secretary of Agriculture for the purpose of entering into cooperative agreements with willing State and local governments, private and nonprofit entities and landowners for protection, restoration and enhancement of fish and wildlife habitat, and other resources on public or private land or both that benefit these resources within the watershed. (Wyden Amendment) P.L. 105-277, Omnibus Appropriations Act for 1999, Title III, Sec 323. Extends authority for Secretary of Agriculture to use funds for Watershed Restoration and Enhancement Agreements for fiscal years 1999-2001. P.L. 107-63 Interior and Related Agencies Appropriations for 2002, Title III, Sec 330, Extends authority for Secretary of Agriculture to use funds for Watershed Restoration and Enhancement Agreements for fiscal years 2002 through 2005.

P.L. 106-393, Oct. 30, 2000, The Secure Rural Schools and Community Self-Determination Act of 2000. To restore stability and predictability to the annual payments made to States and counties containing National Forest System lands and public domain lands managed by the Bureau of Land Management for use by the counties for the benefit of public schools, roads, and other purposes. The authority to initiate projects under this title shall terminate on September 30, 2006.

P.L. 106-113, Consolidated Appropriations Act for FY 2000. Title II Sec. 331.(Enhancing Forest Service Administration of Rights-of-way and Land Uses.) The Secretary of Agriculture shall develop and implement a pilot program for the purpose of enhancing forest service administration of rights-of-way and other land uses. The authority for this program shall be for fiscal years 2000 through 2004. P.L. 108-447, Consolidated Appropriations Act, 2005", December 8, 2004 Title III – General Provisions, Sec. 345, extends authorization until 2005.

P.L. 108-447, Consolidated Appropriations Act, 2005", December 8, 2004 Title II – Administrative Provisions, Beginning on June 30, 2001 and concluding on December 31, 2005, an eligible individual who is employed in any project funded under title V of the Older American Act of 1965 and administered by the Forest Service shall be considered to be a Federal employee for purposes of chapter 171 of title 28, United States Code.

P.L. 108-447, Consolidated Appropriations Act, 2005", December 8, 2004, General Provisions Title III, Sec. 337 (Utah Good Neighbor), The Secretary may permit the State Forester of the State of Utah to perform forest, rangeland and watershed restoration services on NF system lands in the State of Utah until September 30, 2006.

APPENDIX C

"Stewardship Contract Determination Matrix"
(Taken from the Stewardship Contracting Handbook 2409.19 Ch. 60, table 62.1)

Stewardship Contract Use Matrix

Type of Use	CONTRACTS			
	Integrated Resource Timber Contract (IRTC) FS-2400-13 Scaled	Integrated Resource Timber Contract (IRTC) FS-2400-13T Tree Measurement	Integrated Resource Service Contract (IRSC) Scaled	Integrated Resource Service Contract (IRSC) Tree Measurement
Best Value Required	Yes	Yes	Yes	Yes
Use for Premeasured Sales	No	Yes	No	Yes
Use for Scaled Sales	Yes	No	Yes	No
Trade Goods for Services	Yes	Yes	Yes	Yes
Retain Receipts	Yes	Yes	No	No
Less than Full and Open Competition Allowed	Yes	Yes	Yes	Yes
Full NEPA compliance required	Yes	Yes	Yes	Yes
Advertise Contracts	Yes	Yes	Yes	Yes
Contracting Officer	Timber	Timber	Service	Service
Maximum Length of Original Contract	10 Years	10 Years	10 Years	10 Years
Service Contract Act (SCA) wages required	No	No	Yes 5/	Yes 5/
Davis-Bacon Act wages required	No	No	Construction only	Construction only
Local woods wage rates applicable	Yes	Yes	No	No
Special Requirements Allowed	Yes	Yes	Yes	Yes
Payment at Flat Rates	Yes	Yes	Yes	Yes
Payment at Escalated Rates 1/	Yes	Yes	No	No
Associated Charges (Road Maintenance, Scaling, and Slash Deposits)	Yes	Yes	Yes	Yes
KV/SSF/BD Fund Plans Allowed	Yes	Yes	No	No
Export Requirements West of 100th Meridian	Yes	Yes	Yes	Yes
Painting and Branding West of 100th Meridian	Yes	Yes	Yes	Yes
Contract Modification Allowed	Yes	Yes	Yes	Yes
Contract Term Extension	Yes	Yes	No	No
Additional Timber Allowed	Yes	Yes	Yes	Yes
Type of Bond Security	Any 6/	Any 6/	Any	Any
Use of Payment Guarantees	Yes	Yes	Yes	Yes
Periodic Payments Required	No	No	No	No
Downpayment Required	No	No	No	No
Bid Guarantee	No	No	Waived	Waived
Performance Bond Required	Optional 7/	Optional 7/	8/	8/
Cooperative Agreements Allowed	Yes	Yes	Yes	Yes
SBA Set-aside Sales	Yes 9/	Yes 9/	No	No

Stewardship Contract Use Matrix (continued)

Type of Use	CONTRACTS			
	Integrated Resource Timber Contract (IRTC) FS-2400-13 Scaled	Integrated Resource Timber Contract (IRTC) FS-2400-13T Tree Measurement	Integrated Resource Service Contract (IRSC) Scaled	Integrated Resource Service Contract (IRSC) Tree Measurement
SSTS Set-aside Sales	Yes 10/	Yes 10/	No	No
Normal Operating Season for product removal	Yes	Yes	No	No
Normal Operating Season for completion of service work 3/	Yes	Yes	No	No
SBA Road Option	Yes	Yes	No	No
Reimbursement of Bond Premium	Yes	Yes	Yes	Yes
Periodic Adjustment of Cost of Service Work	Yes	Yes	Yes	Yes
Market-Related Contract Term Addition	Yes	Yes	No	No
Contract Term Adjustment	Yes	Yes	No	No
Timber Subject to Agreement	Yes	Yes	No	No
Default Damage Provisions	Yes	Yes	No	No
3rd Party Agreements Allowed	Yes	Yes	No	No
Use When Special Provisions Must be Added to Protect Known Heritage Resources	Yes	Yes	Yes	Yes
Use When Special Provisions Must be Added to Protect Habitat of Threatened, Endangered, and Sensitive Species	Yes	Yes	Yes	Yes
Use When Special Provisions Must be Added to Protect Cave Resource	Yes	Yes	Yes	Yes
Report side of the FS-2400-17 4/	Yes	Yes	No	No
TEA Appraisal Summary (FS-2400-17)	Yes	Yes	Yes	Yes
TSA Statement of Account	Yes	Yes	Yes	Yes
Use of Transferred-in Purchaser Credit for Advance Deposits	No	No	No	No
Scheduled Rate Redetermination 2/	Yes	Yes	No	No
Use of Performance Bond for Felled Timber	Yes	Yes	No	No
Tripartite or Bipartite Land Exchange Provisions	Yes	Yes	No	No
Catastrophic Damage Provisions	Yes	Yes	No	No
Specified Road Work	Yes	Yes	Yes	Yes
Temporary Road Construction	Yes	Yes	Yes	Yes
Incompletely Marked Timber	Yes	Yes	No	No

1/ Except for situations that are disadvantageous to the Government, stumpage rate adjustment is required in the western U.S. in contracts with lengths of 3 years or more, and there is an available index (FSM 2431.34). Stumpage rate adjustment may be required in contracts with lengths more than 1 year, but less than 3 years, where there is an available local market with several competitive participants to process

and/or utilize included products or in other situations where it would be advantageous to the government to do so. Forests may include in solicitations to allow Contractors the choice to elect stumpage rate adjustment in their technical proposals in contracts of less than 3 years in length. Evaluate the choice as part of the entire proposal that will result in the best value for the government. Contracts in the western U.S. less than 1 year in length do not have to include stumpage rate adjustment.

2/ Schedule a rate redetermination for contracts with a length longer than 5 years, pursuant to K/T-D/T.3.5# Scheduled Rate Redetermination.

3/ Establish a Normal Operating Season for each service work activity. Group these into no more than two date ranges and include in the Integrated Resource Timber Contract. Follow procedure listed in I and IT.2.1 for adding days to the contract related to delays and interruptions in service operations. See 62.1 - Exhibit 02 for sample calculation of adding contract time and adjusting contract termination date.

4/ Only the name of the successful bidder can be included on the FS-2400-17 for distribution to the public.

5/ Service Contract Act (SCA) wages apply on contracts greater than $2,500 in value.

6/ Secure bonds with corporate surety, deposited securities, cash, irrevocable letter of credit, or assignment of savings account or certificate of deposit (FSH 6509.11k §83.3).

7/ See 65.12 for more information.

8/ To be used in IRSC contracts with product removal. See 65.11 for more information.

9/ IRTC contracts are eligible for SBA set aside

10/ SSTS may be used for stewardship contracts

Bibliography

___. 2006. Green Budget: Fiscal Year 2007 National Funding Priorities for the Environment. <http://www.saveourenvironment.org/GREENBUDGET.pdf>

Anderson, Michelle D. 2003. Pinus contorta var. latifolia. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis/> [2006, May 4].

Black, S.H. 2005. *Logging to Control Insects: The Science and Myths Behind Managing Forest Insect "Pests." A Synthesis of Independently Reviewed Research.* The Xerces Society for Invertebrate Conservation, Portland, OR.

Bosworth, D. N. 2004. "Financing Environmental Analysis." Forest Service Washington Office internal communication, File Code 1920/1930/6520.

Clewell, A. F. 2000. "Restoring for Natural Authenticity." *Ecological Restoration* 18(4): 216.

DellaSala, D. A., et.al. 2003. "A Citizens' Call for Ecological Forest Restoration: Forest Restoration Principles and Criteria." *Ecological Restoration* March 21:1.

Elliot, R. 1997. *Faking Nature: The Ethics of Environmental Restoration.* Lonon: Routledge.

Enzer, M., Imbergamo, B., Brendler, T., Mitzos, M., Goergen, M. 1999. "Quick Guide For Community Forestry Activists: The Federal Appropriations Process." *American Forests* January Vol. 1 No. 1.

Federal Acquisition Regulations, 48 CFR 4 Part 400

Hann, Wendel, Havlina, Doug, Shlisky, Ayn, et al. 2005. Interagency Fire Regime Condition Class Guidebook v.1.2. <http://www.frcc.gov/docs/1.2.2.2/Complete_Guidebook_V1.2.pdf>

Higgs, E. S. 2003. *Nature by Design.* Cambridge, Massachusetts: MIT Press.

Huges, J., Drever R. 2001. *Salvaging Solutions: Science-based management of BC's pine beetle outbreak.* David Suzuki Foundation, Forest Watch of British Columbia Society, and Canadian Parks and Wilderness Society. <http://www.davidsuzuki.org/files/salvaging_solutions.pdf>

Juel, J., Shaffer, R., and Kmon, D. 2001. Appeal to the Regional Forester of the U.S. Forest Service Northern Region: Knox Brooks Timber Sale and Road Rehabilitation. Unpublished.

Juel, J. 2004. Letter to the Lolo National Forest, U.S. Fish and Wildlife Service and U.S. Environmental Protection Service. The Ecology Center Inc. Transmitted via e-mail, on file with author.

Jordan, W.R. III. 1997. "Sunflower Forest: Ecological Restoration as the Basis for a New Environmental Paradigm." In A. D. Baldwin, J. de Luce, and C. Pletsch, eds., *Beyond Preservation: Restoring and Inventing Landscapes.* Minneapolis: University Of Minnesota Press.

Kauffman, M., Fitzpatrick, K. 2004. Innovation and partnership: Siuslaw Stewardship Pilot Siuslaw National Forest. The Siuslaw Institute, Spring.

Light, A. 2000. "Ecological Restoration and the Culture of Nature: a Pragmatic Perspective" In Gobster, P.and Hull, R.B. 2000. *Restoring Nature: Perspectives from the Social Science and Humanities.* Washington, D.C., Covelo, California: Island Press.

Montana Bull Trout Restoration Team. 2000. Restoration Plan for Bull Trout in the Clark Fork River Basin and Kootenai River Basin Montana. Prepared by Montana Department of Fish, Wildlife and Parks, Helena, Montana.

Mills, S. 1995 *In Service of the Wild: Restoring and Reinhabiting Damaged Land.* Boston: Beacon Press.

P.L. 86-517, Act of June 12, 1960, 74 Stat. 215, Multiple-Use Sustained Yield Act of 1960(16 U.S.C. 528-531).

P.L. 94-588, National Forest Management Act of 1976, October 22, 1976 (16 USC 1600-1614).

P.L. 106-393, Oct. 30, 2000, The Secure Rural Schools and Community Self-Determination Act of 2000 (16 USC 500 Note).

P.L. 108-7, February 28, 2003. The Omnibus Consolidated Appropriations Act of Fiscal Year 1999 as amended by section 323 (16 U.S.C. 2104 Note).

P.L. 108-148, The Healthy Forests Restoration Act, December 3, 2003 (16 USC 6501 Note).

P.L. 109-54, Department of the Interior, Environment, and Related Agencies Appropriations Act of 2006, August, 2 2005 (20 USC 959).

P.L. 403-74, Davis Bacon Act of 1931, (40 U.S.C. 3141 *et seq*).

Rhodes, J.J., and Odion, D.C. 2004. "Evaluations of the Efficacy of Forest Manipulations Still Needed." *Bioscience*, Vol. 54 No. 11.

The Act of June 4, 1897, Organic Administration Act of 1897, as amended (16 U.S.C. 473 - 478, 479-482, 551).

The Pinchot Institute for Conservation. 2003. Implementation of Multi-party Monitoring and Evaluation: The USDA Forest Service Stewardship Contracting Pilot Projects FY 2002, *A Report to the USDA Forest Service.* <http://www.fs.fed.us/forestmanagement/projects/stewardship/pilots/fy2002_report/fy2002_stewardship_contracting_report.pdf>

United States v. New Mexico, 438 U.S. 696 (1978)

USDA Forest Service Handbook. Environmental Policy and Procedures Handbook. <http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?1909.15>

USDA Forest Service. 2005. Fiscal Year 2006 Budget Justification. <http://www.fs.fed.us/publications/budget-2006/fy2006-forest-service-budget-justification.pdf>

USDA Forest Service. 2005. Fiscal Year 2006 President's Budget Overview. <http://www.fs.fed.us/publications/budget-2006/fy2006-forest-service-budget-overview.pdf>

USDA Forest Service, 2001. Final Environmental Impact Statement: Knox Brooks Timber Sale and Road Rehabilitation. Lolo National Forest, Superior Ranger District, March.

USDA Forest Service. 2002. Knox Brooks Stewardship Contract. Lolo National Forest. <http://www.fs.fed.us/r1/forest_range/land_stewardship/active_contracts/knox_brooks/knoxbrooks_index.htm>

USDA Forest Service. 2004. Monitoring/Evaluation Report: Knox Brooks Stewardship Project. <http://www.pinchot.org/community/moneval/regional_projects/northwest_rockies/R1_Knox_Brooks_2004.pdf

USDA Forest Service. 2006. Preliminary Fiscal Year 2005 Budget Estimates: NFIM—Inventory & Monitoring. Lolo National Forest, Unpublished database printout.

USDA Forest Service. 2006. Preliminary Fiscal Year 2005 Budget Estimates: Lolo NF FY 2005 Budget Proposal by Program and Activity. Unpublished database printout.

USDA Forest Service Handbook. Program Development and Budgeting Handbook <http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?1909.13>

USDA Forest Service, 2001. Record of Decision: Knox Brooks Timber Sale and Road Rehabilitation. Lolo National Forest, Superior Ranger District, May.

USDA Forest Service Handbook. Renewable Resource Uses for Knutson-Vandenberg (K-V) Fund Handbook. <http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2409.19>

USDA Forest Service. 2004. USDA Forest Service Strategic Plan for Fiscal Years 2004-2008. <http://www.fs.fed.us/publications/strategic/fs-sp-fy04-08.pdf>

USDI Fish and Wildlife Service. 2002. Draft Bull Trout Recovery Plan. Clark Fork River Recovery Unit. November, 2002.

Weinburg, M., and Guglielmino, J. 2000. ""Quick Guide For Community Forestry Activists: "Understanding the Federal Budget Process." *Communities Committee of the Seventh American Forest Congress* and *American Forests* March Vol. 1 No. 3.

Wickersham, K. 2003. "Summary of Forest Program of Work." Lolo National Forest, Unpublished.

Wickersham, K. 2006. "Budget Formulation, Presentation and Justification Process." Lolo National Forest, Unpublished.