

**Internal Organization and External Contracting for the NEPA Process:  
Lessons from New Institutional Economics and Strategic Organizational Design**

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£ The long term intent is to publish several referred journal articles based upon this paper and the information contained within.

## 1. Introduction

The National Environmental Policy Act of 1969 (NEPA), signed by President Nixon January 1, 1970, provides a brief but powerful statement of national policy “to encourage productive and enjoyable harmony between man and his environment.”<sup>1</sup> Best known as the origin of environmental impact statement (EIS), NEPA also provided the organic act for the Council on Environmental Quality (CEQ).<sup>2</sup>

The U.S. Forest Service expends a great deal of resources complying with the requirements of NEPA. A large number of its land and resource management initiatives depend upon successful completion of the NEPA process. Unfortunately, the process is often contentious, leading to delays in important projects.

Because of the high financial and operational stakes involved in NEPA compliance, the Forest Service is considering alternative approaches for managing the process. One central question is whether NEPA compliance, in whole or part, might be better carried out through external contracting. A related issue is how the Forest Service should design its internal organization to best carry out the NEPA mandate. And finally, for those NEPA activities that are executed by contract in the marketplace, the Forest Service needs to consider what sort of contracting arrangements might best serve its NEPA goals. The purpose of this report is to seek preliminary answers to these questions.

### a. Background

Fundamentally, NEPA requires that federal agencies consider environmental impacts as part of their decision making process. The primary mechanism for implementing this requirement is the mandate that agencies considering an action “significantly affecting the quality of the human environment” include in their report “a detailed statement” that addresses the environmental impacts, unavoidable adverse environmental effects, and alternatives to the proposed action.<sup>3</sup>

Although NEPA itself was written in general terms, CEQ developed regulations to provide more specific guidance, found now at 40 CFR §§ 1500 *et. seq.* Under the CEQ regulations, each agency is required to develop guidelines of its own to implement the NEPA requirements in its particular area.<sup>4</sup> In the case of the United States Forest Service (USFS), those guidelines can currently be found in the USFS Environmental Policy and Procedures Handbook.<sup>5</sup>

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<sup>1</sup> 42 U.S.C. § 4321.

<sup>2</sup> 42 U.S.C. § 4342.

<sup>3</sup> 42 U.S.C. § 4332(C).

<sup>4</sup> 40 C.F.R. § 1507.3

<sup>5</sup> Forest Service Handbook §1909.15. On August 16, 2007 a Notice of Proposed Rule was published in the Federal Register [Vol. 72, No. 158, pp 45998-46009] that would move the majority of these procedures from the agency handbook to Federal Regulation (36 CFR part 220).

The “detailed statement,” which eventually became known as the environmental impact statement (EIS), is only one of the possible mechanisms for adhering to the NEPA requirements. The CEQ regulations also allow agencies to identify categories of actions that have little or no negative cumulative environmental effects.<sup>6</sup> These activities can be classified as “categorical exclusions,” and can be exempted from the NEPA requirements for formal analysis. For proposed actions that do not qualify for categorical exclusions but also do not necessarily require preparation of an EIS, the CEQ regulations provide for agencies to prepare an environmental assessment (EA)<sup>7</sup>, a “concise public document” that briefly provides “sufficient evidence and analysis for determining whether to prepare an environmental impact statement” or a “finding of no significant impact”(FONSI).<sup>8</sup>

The NEPA requirements involve costs. A 1999 report by the National Academy of Public Administration found that approximately 40 percent of the total direct Forest Service work effort at the forest level was associated with “planning and assessment,” which includes:

Activities associated with the development, approval, and publication/dissemination of forest plans; National Environmental Policy Act, Forest and Rangeland Renewable Resource Planning Act, and National Forest Management Act documentation; and strategic and specific planning efforts required for inter-regional and inter-agency documentation and litigation/compliance.<sup>9</sup>

By one reckoning, this category of work, dominated by NEPA compliance, is costing the Forest Service at least \$250 million per year, of which at least \$100 million is avoidable.<sup>10</sup> By another measure, “conducting environmental analyses and preparing environmental documents consumes about 18 percent of the funds available to manage the national forests and approximately 30 percent of the agency’s field resources.”<sup>11</sup>

The Forest Service is the single largest generator of environmental impact statements:

In 1995, the Forest Service reported that it prepared about 20,000 environmental documents annually—more than any other federal agency. In 1994...the Forest Service issued almost 20 percent of all the final environmental impact statements prepared by federal agencies (50 out of a total of 253).<sup>12</sup>

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<sup>6</sup> 40 C.F.R. § 1508.4

<sup>7</sup> 40 C.F.R. § 1501.3

<sup>8</sup> 40 C.F.R. § 1508.9

<sup>9</sup> National Academy of Public Administration. 1999. Restoring Managerial Accountability to the United States Forest Service. p.18.

<sup>10</sup> USDA Forest Service. 2002. The Process Predicament: How Statutory, Regulatory, and Administrative Factors Affect National Forest Management. p. 35.

<sup>11</sup> U.S. General Accounting Office. 1997. Forest Service Decision-Making: A Framework of Improving Performance. GAO/RCED-97-71. p. 28.

<sup>12</sup> Ibid.

More recently, in “2006, it issued 144 final EISs—more than 25 percent of the total prepared by all federal agencies”.<sup>13</sup> From 1970 to 2004, the agency filed 3,468 Draft Environmental Impact Statements, which equates to approximately 15 percent of the total number of DEIS (22,757) filed by all federal agencies. Between 1998 and 2004, the Forest Service accounted for almost 26 percent (895) of all documents filed with Environmental Protection Agency.<sup>14</sup>

Compliance with NEPA requirements, particularly those that pertain to document preparation, has not only encumbered Forest Service resources, but has had other unfortunate consequences, including delays and diminished predictability in project implementation.<sup>15</sup> One measure of the challenges that the Forest Service faces is the number of lawsuits it defends each year. From 1989 to 2002, the Forest Service defended 729 suits in federal courts, won 57.6 percent of the cases, lost 21.3 percent, and settled 17.6 percent.<sup>16</sup> It has been suggested that the Forest Service believes such litigation “constrains its professional expertise and frustrates effective management.”<sup>17</sup>

It is not surprising, then, that the Forest Service has questioned whether there might be better ways to organize its NEPA-related activities. Although the question has been addressed several times over the past decade<sup>18</sup>, a new sense of urgency was raised by the requirements that the U.S. Office of Management and Budget (OMB) has placed on federal agencies to identify opportunities to more fully “rely on the private sector for needed commercial services.”<sup>19</sup> OMB directed federal agencies to assure that commercial activities are “subject to the forces of competition” by conducting analyses that include, among others, the following steps:

- Identify all activities performed by government personnel as either commercial or inherently governmental.
- Perform inherently governmental activities with government personnel.
- Use a streamlined or standard competition to determine if government personnel should perform a commercial activity.

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<sup>13</sup> CEQ. 2007. Calendar Year 2006 Filed EISs. Available at:

[http://ceq.eh.doe.gov/nepa/Calendar\\_Year\\_2006\\_Filed\\_EISs.pdf](http://ceq.eh.doe.gov/nepa/Calendar_Year_2006_Filed_EISs.pdf)

<sup>14</sup> Tzoumis, Kelly. 2007. Comparing the quality of draft environmental impact statements by agencies in the United States since 1998 to 2004. *Environ Impact Asses Rev.* 27: 26–40.

<sup>15</sup> USDA Forest Service. 2002. *The Process Predicament: How Statutory, Regulatory, and Administrative Factors Affect National Forest Management.* p. 13. See also, Clarke, J.N. and D. McCool . 1996 . *Staking Out the Terrain: Power and Performance among Natural Resource Agencies .* 2nd ed . Albany : State University of New York Press, who state, p. 15: “Litigation is a weapon often used today by all sides in environmental disputes. For agency officials, the usual result of judicial review is delay and/or stalemate. Although few challenge the legitimacy of the courts micro-managing the bureaucracy, their involvement clearly has been frustrating to the majority of resource managers. They see it as contributing to the pathological condition known as governmental gridlock.”

<sup>16</sup> Keel, D.; R. Malmshemer; D. Floyd; and J. Perex. 2006. *Forest Service Land Management Litigation 1989-2002.* *Journal of Forestry.*

<sup>17</sup> *Ibid.*

<sup>18</sup> See, e.g., National Academy of Public Administration. 1999. *Restoring Managerial Accountability to the United States Forest Service;* U.S. General Accounting Office. 1997. *Forest Service Decision-Making: A Framework of Improving Performance.* GAO/RCED-97-71; USDA Forest Service. 2002. *The Process Predicament: How Statutory, Regulatory, and Administrative Factors Affect National Forest Management.*

<sup>19</sup> Office of Management and Budget, Executive Office of the President. 2003. Circular No. A-76 (Revised).

- Develop government cost estimates for standard and streamlined competitions.
- Track execution of streamlined and standard competitions.
- Assist adversely affected federal employees.<sup>20</sup>

To assist its agencies in the implementation of the OMB requirements for competitive sourcing, the Office of the Chief Financial Officer of the USDA has issued a bulletin providing “guidance in determining the feasibility of conducting public-private competitions.”<sup>21</sup> In response to the President’s Management Agenda, the Forest Service is using tools such as competitive sourcing, performance and budget integration, and improved financial management to improve the cost effectiveness and performance of its programs. The Forest Service has determined that feasibility studies will be conducted to determine whether activities will benefit from further analysis in accordance with Office of Management and Budget (OMB) Circular No. A76 or Business Process Reengineering (BPR) and, if so, what study approach appears most appropriate.<sup>22</sup>

The USDA Forest Service “Green Plan” identified NEPA activities to be evaluated through a feasibility study in fiscal year 2007. Personnel who work at least a cumulative ten days per year on NEPA, whether managing, coordinating, supervising or administering contracts for NEPA, were asked to respond to a data call that occurred in February/March of 2007<sup>23</sup>. The feasibility study will assess the current volume of work, the organizational infrastructure, the potential impact on the Agency’s workforce, what is currently being contracted, service/product standards and performance measures, a market analysis of private industry, other agencies’ approaches to NEPA, a cost-benefit analysis, and recommendations regarding the future accomplishment of NEPA activities.

Upon completion of the feasibility study, the Forest Service will determine whether to complete certain activities with private sector providers. “Competitive Sourcing” is a program that requires federal agencies to identify their “commercial type” jobs and invite private sector organizations to compete against the “most efficient organization” the agency can propose to perform the function in the future using primarily federal employees.<sup>24</sup> The Forest Service has already conducted such an analysis for the provision of information technology services and a variety of business operations. The analysis for information technology, which has been the largest to date for the agency, resulted in a competitive sourcing process that was ultimately won by Federal Employees, engaged under a “contract-like” relationship.<sup>25</sup>

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<sup>20</sup> Ibid, §4.

<sup>21</sup> Office of the Chief Financial Officer. U.S. Department of Agriculture, OCFO Bulletin 2004-001.

<sup>22</sup> USDA Forest Service. 2005. “Green Plan” FY 2005-2009.

<sup>23</sup> USDA Forest Service. 2007. NEPA Feasibility: Study memo sent to Regional Foresters and others from Hank Kashdan, Deputy Chief for Business Operations.

<sup>24</sup> National Academy of Public Administration. 2006. First Year Assessment: USDA Forest Service Information Solutions Organization. p.xi.

<sup>25</sup> USDA. 2005. Audit Report: Forest Service’s Financial Statements for Fiscal Years 2005 and 2004 Report No. 08401-6-FM.

## b. Organization of Report

The Forest Service's quest to better manage the NEPA process raises important and fundamental questions. First, which NEPA-related activities are best performed internally by Forest Service personnel and which might be better executed externally through contract relations? Second, for those activities that are retained for internal execution, what organizational structure is the most compatible? Finally, for those activities that are contracted outside the organization, what types of contracts are most suitable and how will they be efficiently and effectively managed?

The purpose of this report is to seek preliminary answers to these questions. Unfortunately, the answers are not simple—there is little black-and-white. However, there is a substantial literature, in fact several literatures, on which the Forest Service can draw to gain insight into its “work design”<sup>26</sup> problem. New Institutional Economics (NIE) provides a powerful framework for understanding the fundamental “make-or-buy” decision. NIE is based on the relatively simple but very powerful observation that each work item, or “transaction,” can be described based on a relatively few characteristics. Based on criteria such as efficiency, product quality, and customer satisfaction, market arrangements are generally preferred to in-house or “hierarchical” approaches. However, it is also true that certain combinations of factors may favor the internal production solution. NIE was initially developed to provide insight into possible explanations of why firms vertically integrate. More recently the framework has been expanded to apply to the organization of public or government activities. Much of that extension can be found in the so-called privatization literature.

Although NIE provides profound insights into the “make-or-buy” decision, it tends to assume rather than explain the design and efficacy of internal organization or hierarchical arrangements. To provide insight regarding how the Forest Service might organize its internal NEPA activities, this report draws on the literature for strategic organizational design, which focuses primarily on the locus of decision-making authority and the transfer of information.

This report reaches several important conclusions. Perhaps paramount among them is that although day-to-day NEPA compliance may be appropriately organized as a decentralized activity that facilitates tactical responses to local conditions, the Forest Service leadership needs to provide clearer strategic guidance regarding the purpose and goals for the NEPA process. This report also demonstrates that the NEPA process is, in fact, an aggregation of many different types of activities. Some of these activities may be quite amenable for execution through the marketplace, i.e., some form of outsourcing, while others must necessarily be conducted by Forest Service personnel. The greatest challenge for evaluating opportunities for competitive sourcing is sorting through the wide range of activities that could be appropriately conducted either internally or externally, and designing the control mechanisms that will facilitate management of those that are outsourced.

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<sup>26</sup> This term is borrowed from Sina K. and A Van de Ven. 2005. Designing Work Within and Between Organizations. *Organization Science*. 16(4): 389-408, p.390.

New Institutional Economics adopts as its unit of analysis the “transaction.” The next section of this report provides a brief discussion of what constitutes a transaction and provides examples of a range of transactions. Section 3 discusses the importance of developing a clear purpose for the Forest Service’s NEPA compliance activities and the relation that might have to organizational and contract design. Section 4 lays out the “make or buy” problem the Forest Service faces in designing the NEPA process: deciding which tasks to conduct in-house and which to take to the marketplace. Section 5 draws on the strategic organizational design literature to explore the tension between developing consistent organizational goals and allowing field personnel the authority to make decisions that reflect local or specific knowledge. Section 6 draws on the concepts of New Institutional Economics to discuss the basic principles of external contracting, including the characteristics of transactions that are most appropriate for executing through the marketplace, the contractual mechanisms that allow adaptation of contracts to new information, and the use of credible commitments to protect parties from the opportunistic behavior of their contracting partners. Section 7 applies the principles developed in Sections 5 and 6 to the NEPA process, employing a detailed Forest Service study of the types of work tasks that are involved in compliance. Section 8 provides conclusions.

## **2. Identifying the Unit of Analysis**

To build the framework with which to consider the Forest Service’s NEPA work design, it is important to first consider the concept of a “transaction”—the fundamental unit of analysis. In this context, a transaction occurs when a “good or service is transferred across a technologically separable interface.”<sup>27</sup> A technologically separable interface refers to any two separable parties with distinct interests: e.g., two firms, a government and a contractor, or even a supervisor and an employee.

To understand the concept of a transaction, consider examples of goods and services the Forest Service might require:

- Pencils and other office supplies
- Printing services
- Biological, hydrological, and other scientific analyses
- Effects analyses, document writing/editing
- Facilitation services for a public meeting
- Field communication services during wildfire suppression
- Services to design and build a new website
- Public representation to respond to concern about the loss of recreational opportunities
- Decision-making regarding long-term directions and goals for National Forests

Each one of these involves the production or provision of a good or service and its transfer to the Forest Service, whether something as concrete as pencils or as abstract as decision making. If the provision of each requires some form of transaction, which ones should be executed by pure market transactions and which should be produced through purely internal (hierarchical) transactions, i.e., by employees?

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<sup>27</sup> Williamson, O. 1985. *The Economic Institutions of Capitalism*. p.1.

We would never expect the Forest Service to produce its own pencils. It will always go to the market for that good. In contrast, we know that goal setting and making major strategic decisions are purely internal functions. But we can imagine that some of the items on the list, such as website development, facilitation services, and even printing services, could be provided by either internal or external arrangements.

So, what are the important characteristics that differentiate transactions that are best suited for internal execution from those that can be better organized through the market? The fact is that there are a fairly small number of key characteristics that determine whether a transaction is better executed in-house or carried out through market mechanisms. However, actually evaluating those characteristics for a given activity can be challenging.

Turning to the immediate application, how can the Forest Service evaluate its NEPA activities with respect to the key characteristics? It is important to address two important issues. First, complying with NEPA is not necessarily a single activity. In fact, NEPA compliance for a single proposed project can involve hundreds of individual steps, each one a distinct transaction. This suggests that some NEPA activities may have characteristics consistent with contracting through the market while others are better suited to a hierarchical, internal arrangement.

Second, the characteristics of the NEPA activities depend largely on the purpose of the NEPA process. Unfortunately, the Forest Service does not seem to have a clear, unified picture of the underlying goals for its compliance with NEPA.<sup>28</sup> It is to this question that we turn next.

### **3. The Purpose of Forest Service NEPA Activities**

Nanus suggests that "the basic nature" of an organization can be defined by determining its present purpose and its value to society.<sup>29</sup> The Forest Service NEPA organizational structure could be described as a complex open system, as the organization structure is open to and dependent on the environment, especially regarding connections with external and internal components.

Field interviews with a number of Forest Service personnel as well as a review of documents posted to the Forest Service Intranet reveal a lack of clear organizational direction regarding the purpose of the NEPA activities.<sup>30</sup> In fact, it is possible to detect at least three purposes.

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<sup>28</sup> U.S. General Accounting Office. 1997. Forest Service Decision-making: A Framework for Improving Performance. GAO/RCED-97-71, p. 40.USFS.

<sup>29</sup> Nanus, B. 1992. Visionary leadership: Creating a compelling sense of direction for your organization. San Francisco: Jossey-Bass.

<sup>30</sup> See our companion report, Contrasts in NEPA: Approaches by U.S. Forest Service Region 1 and Region 6: A Pilot Study. See also, MacGregor, D.G.; Seesholtz, D.N. In review. Factors Influencing Line Officers' Decisions about NEPA Project Design and Development.; Sterns, M.J.; Mortimer, M.J. In review. Comparing NEPA Processes Across Federal Land Management Agencies. Advance copy available at [http://www.fs.fed.us/pnw/about/programs/fsd/NEPA/Comparing\\_NEPA\\_Fed\\_agencies\\_VT.pdf](http://www.fs.fed.us/pnw/about/programs/fsd/NEPA/Comparing_NEPA_Fed_agencies_VT.pdf)

**a. Improve the decision-making process.**

The original intent of NEPA was to assure that all Federal agencies used “a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment.”<sup>31</sup> To this end, NEPA directed the agencies to work with CEQ to develop “methods and procedures...which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations.”<sup>32</sup>

The CEQ regulations elaborate:

Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork—even excellent paperwork—but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. These regulations provide the direction to achieve this purpose.<sup>33</sup>

Many in the Forest Service, especially those in positions of leadership, espouse this philosophy of NEPA compliance, and consider EISs, EAs and related documents to be tools to promote better decision making. For them, the process facilitates more systematic consideration of environmental values affected by Federal actions. “Decision confidence is of significant importance to line officers, since they must speak for the project to audiences and constituents both inside and outside of the agency. Line officer management of the NEPA process and the work of their staff is a significant source of confidence in decision making and goes beyond the information content of the NEPA documentation (e.g., EA).”<sup>34</sup>

**b. Inform and Engage the Public**

NEPA also requires that all of the detailed statements be made available not only to the “Federal, State and local agencies, which are authorized to develop and enforce environmental standards,” but to the public as well.<sup>35</sup> The more detailed regulations developed by CEQ provide that

NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. [P]ublic scrutiny [is] essential to implementing NEPA. Most important, NEPA documents must

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<sup>31</sup> 42 U.S.C. § 4332(A)

<sup>32</sup> 42 U.S.C. § 4332(B)

<sup>33</sup> 40 C.F.R. 1500.1(c)

<sup>34</sup> MacGregor, D.G.; Seesholtz, D.N. In review. Factors Influencing Line Officers' Decisions about NEPA Project Design and Development.

<sup>35</sup> 42 U.S.C. § 4332(C).

concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail.<sup>36</sup>

More specifically, the regulations require that agencies “[m]ake diligent efforts to involve the public in preparing and implementing their NEPA procedures.”<sup>37</sup> The regulations provide detailed guidance on hearings, public meetings, notice, public comment, and response to comments.<sup>38</sup>

In a recent study by Virginia Polytechnic Institute and State University comparing NEPA processes across four federal land management agencies, including the Forest Service, the most common response by personnel from each of the agencies to the question posed as to the purpose of the NEPA processes was to disclose to the public and other interested parties the likely consequences of agency actions, the analyses undertaken to determine those consequences, and the procedures through which NEPA requirements have been met. Just as frequently, Forest Service personnel also responded that the purpose of the NEPA process is to actively involve the public, to ensure deeper consideration of environmental impacts than might otherwise be considered, and to make better decisions.<sup>39</sup>

The view of NEPA as a means to promote public involvement is espoused not only by many in the Forest Service leadership but by virtually all environmental organizations.<sup>40</sup>

### **c. NEPA as a Legal Hurdle**

The Forest Service wins the majority of its legal cases; however, judicial review of national forest management decisions is steadily increasing.<sup>41</sup> Some members of the Forest Service, particularly field personnel, are inclined to regard NEPA as an obstacle to overcome, a procedure to be endured, so that they can get on with the truly important work of conserving and managing the nation’s forests.<sup>42</sup> Additionally, many individuals of the public and interest groups use the Forest Services public participation process to challenge the management agenda of the agency and the current administration.<sup>43</sup>

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<sup>36</sup> 40 C.F.R. 1500.1(b).

<sup>37</sup> 40 C.F.R. 1500.6(a).

<sup>38</sup> 40 C.F.R. 1500.6(b)-(f)

<sup>39</sup> Sterns, M.J.; Mortimer, M.J. In review. Comparing NEPA Processes Across Federal Land Management Agencies. Advance copy available at

[http://www.fs.fed.us/pnw/about/programs/fsd/NEPA/Comparing\\_NEPA\\_Fed\\_agencies\\_VT.pdf](http://www.fs.fed.us/pnw/about/programs/fsd/NEPA/Comparing_NEPA_Fed_agencies_VT.pdf)

<sup>40</sup> Luther, L. 2006. The National Environmental Policy Act: Streamlining NEPA. Congressional Research Service Report for Congress, RL33267.

<sup>41</sup> Malmsheimer, R.W.; Keele, D.; Floyd, D.W. 2004. National Forest Litigation in the US Courts of Appeals. *Journal of Forestry*. pp 20-25.

<sup>42</sup> USDA/FS. 2002. The Process Predicament: How Statutory, Regulator, and Administrative Factors Affect National Forest Management, p. 15 and app. C, p. C-11. See also our companion report, *Contrasts in NEPA: Approaches by U.S. Forest Service Region 1 and Region 6: A Pilot Study*. See also, MacGregor, D.G.; Seesholtz, D.N. In review. Factors Influencing Line Officers’ Decisions about NEPA Project Design and Development.

<sup>43</sup> Germain, R.H.; Floyd, D.W.; Stehman, S.V. 2001. Public perceptions of the USDA Forest Service public participation process. *Forest Policy and Economics* 3(2001):113-124.

With increasing frequency from 1984 to the present, environmentalists trained their sights on the Forest Service. The agency inherited, from the Corps of Engineers, the unflattering distinction of being Public Enemy Number One. The battle ground was principally, though hardly exclusively, the Pacific Northwest and Rocky Mountain Regions, where not only established organizations like the Sierra Club and the Audubon Society criticized the agency but a whole new generation of interest groups sprouted up to protect the spotted owl, the grizzly bear, the Pacific salmon, old-growth forests, and the yew tree.<sup>44</sup>

As many Forest Service employees see it, they are caught in a bind, where the very procedures they need to follow to get them to their goal keep them from getting there. As one influential Forest Service report stated,

Too often, the Forest Service is so busy meeting procedural requirements, such as preparing voluminous plans, studies, and associated documentation, that it has trouble fulfilling its historic mission: to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.<sup>45</sup>

Those who are frustrated by the seemingly endless requirements of the NEPA process for more information and documentation may view the environmental analysis process and its associated studies as the tail that wags the dog. Where the NEPA process was intended to be an aid in decision making, it has become an obstacle. The legal formalization of the procedures has substituted for professional judgment.<sup>46</sup>

Worse, this logic goes, in many cases that have pitted Forest Service personnel against special interests, generally environmentalists, the NEPA procedures have been used as a roadblock to taking considered, even urgent, action to protect the health of forests imperiled by disease or fire.<sup>47</sup> In some cases, environmental groups have issued legal challenges to Forest Service NEPA procedures on an almost automatic basis. This has led to the perception among some Forest Service personnel that NEPA is a necessary evil. Under this view, NEPA documents are designed not to inform decisions or involve the public, but to withstand legal challenges.

...some groups have successfully used appeals to obstruct timber sales, and Forest Service employees therefore treat almost every ground-disturbing project as a potential target. They spend a tremendous amount of time trying to "bullet-proof" project planning against

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<sup>44</sup> Clarke, J.N.; D. McCool . 1996 . Staking Out the Terrain: Power and Performance among Natural Resource Agencies . 2nd ed . Albany : State University of New York Press, p. 62.

<sup>45</sup> USDA Forest Service. 2002. The Process Predicament: How Statutory, Regulatory, and Administrative Factors Affect National Forest Management.

<sup>46</sup> Ibid, p.11.

<sup>47</sup> Ibid, p.7.

appeals and litigation. Challenges themselves, if they materialize, can be enormously time-consuming.<sup>48</sup>

**d. The Importance of Purpose**

As the Forest Service considers how to organize its NEPA activities—which to keep in house and which to competitively source, which to control from a centralized authority and which to decentralize—it is important that the organization first clarify the purpose of its program. This is a case in which function dictates form.

If the Forest Service goals for NEPA are simply to survive legal challenges so the field personnel can implement the plans that in their professional judgment are the best alternatives, then it may be more effective to assign the process to a highly centralized, very experienced set of litigation-savvy consultants, internal or external. This group would create the NEPA documents, adhere to the letter of the law, defend their products against legal challenges, and then notify the Forest Service when they have the green light to proceed with their projects.

If, on the other hand, the Forest Service's goal for NEPA is to engage in a process that aids in better decisions, the specialization implicit in the arrangement described above is inappropriate because it separates the decision tool from the decision maker. Similarly, if the Forest Service wants to emphasize public involvement in the decision making process, another type of organizational arrangement may be more appropriate.

In short, it is necessary for the Forest Service to realistically determine its goals first, particularly as expressed by the top leadership of the agency. Only then can it design an organizational strategy that will best promote those objectives.<sup>49</sup>

Whichever goal or goals the Forest Service adopts for NEPA compliance, it is important that the objectives be clearly enumerated. First, a clear set of goals will help evaluate which NEPA tasks can be conducted internally and which externally. Second, whether the compliance tasks are conducted internally or externally, the Forest Service will need to develop metrics of performance and incentive systems to promote the NEPA goals. If the goals themselves are ill-defined, it will be impossible to design a satisfactory management approach. As one contracting officer in the Forest Service explained regarding the experience:

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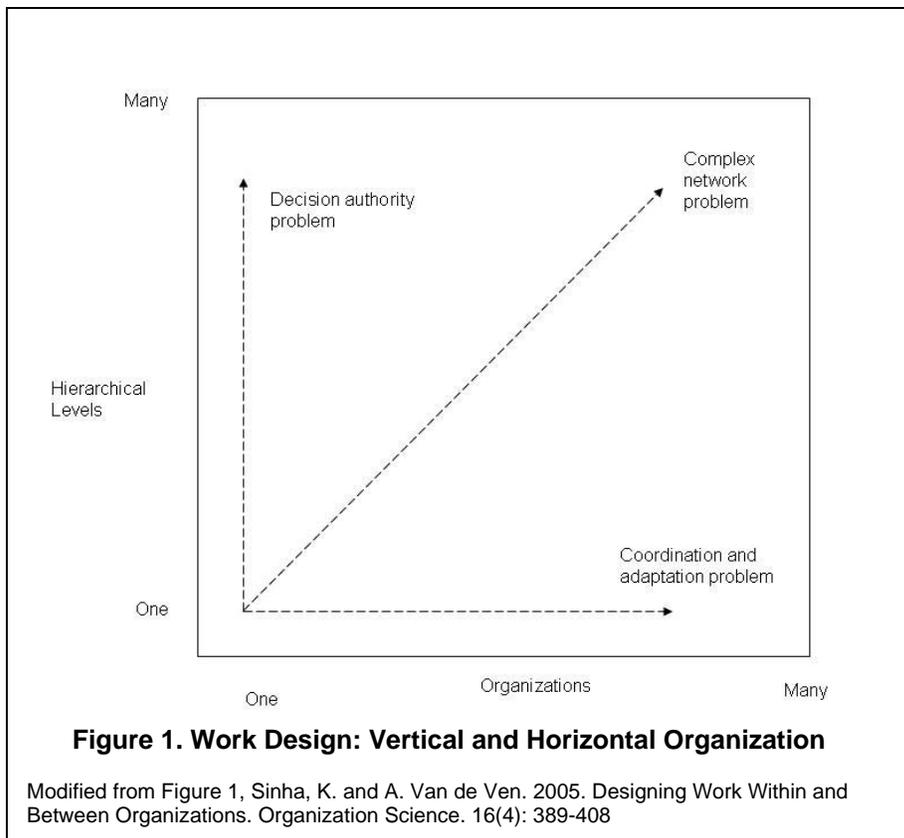
<sup>48</sup> Ibid, p.36.

<sup>49</sup> This is not a small undertaking and would take a significant agency transition to make a substantial difference. Forest Service "initiatives" have been many, with few actually having a long-term impact on the agency. Some would argue that the late 1980s "Ecosystem Management" approach initiated by the Forest Service, which became the pattern for other federal and many state agencies, was the last significant agency transition. Before that, the Forest Service underwent a major shift related to the integration of planning requirements under the National Forest Management Act. Of the two, "the adoption of an ecosystem management framework provides greater change than the earlier requirements of integrated forest plans under NFMA." From Kaiser B.A. 2006. The National Environmental Policy Act's Influence on USDA Forest Service Decision-Making, 1974-1996. *Journal of Forest Economics* 12: 109-130, p. 124.

...one of the most voiced ‘complaints’ from the contractors, and that includes others not involved on the [Forest], was that the FS does not have a fixed objective in its NEPA process...there are often so many changes we make ‘along the journey’ in our specialist’s efforts to address every possible (or impossible) challenge, that the contractor can end up putting too much effort into pleasing our reviewers rather than addressing the scoping concerns and fully meeting the intent of the law in their analysis.<sup>50</sup>

#### 4. The Two-Part Question for Work Design

The Forest Service is facing a “work design” problem. It must develop a system of “arrangements and procedures for organizing” the NEPA work.<sup>51</sup> There are two dimensions that help describe the organization of work: vertical levels and horizontal divisions (Figure 1). Vertical levels refers to the extent to which an organization uses hierarchical arrangements to organize resources, information, and especially decision making within the establishment. Thus, a very hierarchical organization, with many levels of managers, is placed higher on the vertical axis, while a relatively flat organization is placed closer to the origin. Horizontal divisions refers to the extent to which the work is distributed across many operational units



within the organization or among other organizations.<sup>52</sup> So an organization that contracts out much of its activity is further to the right on the horizontal axis while an organization that produces most of its output within its own organization is closer to the origin.

As suggested by Figure 1, organizing work along either dimension carries with it particular challenges. Arranging work within a hierarchy,

<sup>50</sup> “Past NEPA Contracting Experiences – Region 1”, anonymous internal document, posted to Region 1 intranet. Copy on file with authors.

<sup>51</sup> Sinha, K. and A. Vande Ven. 2005. Designing Work Within and Between Organizations. Organization Science. 16(4): 389-408.

<sup>52</sup> Ibid.

relatively far up the vertical axis, raises the issue of how authority is distributed and decision making is organized. This in turn raises the issue of how information is gathered and managed. For the Forest Service's NEPA activities, the challenge is how to get the many National Forests and Districts to adhere to the NEPA objectives determined by the Chief of the Forest Service and other senior USDA officials.

The modularity problem associated with the horizontal dimension—coordinating work among two or more distinct organizational units—refers to the problem of identifying separable components of the work. The tasks assigned across Forest Service units and its contractors must be designed not only as separable, relatively independent responsibilities, but must also match the type of work to the skills of the assignee.

With a process as complex as NEPA compliance, it is unlikely that all work will be organized through either entirely vertical or entirely horizontal arrangements. As Figure 1 emphasizes, this raises challenges associated with managing a complex network of players in which authority, knowledge, skills, and other resources are dispersed throughout. Within the Forest Service, a task such as the completion of a specialist's report may be separable; however, that product may also be intertwined with other tasks. For example, a wildlife biologist may be dependent upon the results of a forest vegetation report to draw effective conclusions. Additionally, the act of representing the agency may also influence the final outcome of the report. Such would be the case in a biological determination or the determination of significance.

Before moving to a discussion of the basic principles for organizing work within the Forest Service hierarchy and across Forest Service units and their contractors, it is important to reemphasize that any difficulties involved in organizing work in the complex network will only be compounded by the presence of goal ambiguity. If the Forest Service does not have a clear policy mission with respect to NEPA compliance, it will not be possible to effectively organize and manage the many units that could potentially be involved.

## **5. Basic Principles for Internal Organization**

The Forest Service is organized as a highly decentralized hierarchy. The Washington D.C. headquarters is directed by the Chief of the Forest Service and organized under three branches, the largest being the National Forest System with its nine geographically based regions, each with a Regional Office headed by a Regional Forester. The National Forest System, in turn, is organized into National Forests and Grasslands, which are further divided into Districts and, in some cases, Units. Nationally, there are 155 National Forests, 22 National Grasslands and approximately 600 Districts.<sup>53</sup> Apart from the National Forest System, the other branches of the Forest Service are Research and Development (five regional stations and one national laboratory), and State & Private Forestry. The analysis in the ensuing paragraphs considers organizational dynamics between the Office of the Chief and the National Forest System, in particular.

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<sup>53</sup> See: [http://www.fs.fed.us/recreation/programs/facts/facts\\_sheet.shtml](http://www.fs.fed.us/recreation/programs/facts/facts_sheet.shtml)

The fundamental issue for the design of internal activities is that of matching the locus of knowledge with the locus of decision-making authority.<sup>54</sup> Organizations can only function efficiently when those who have the knowledge necessary for decisions also have the authority to make those decisions. Windsperger observes:

Collocation of decision rights with knowledge can be achieved by transferring the knowledge to the person who has the decision right or by transferring the decision rights to the person with the knowledge. This means that knowledge transfer costs determine the degree of centralization of decision making. Decision rights tend to remain in the CEO's office when the costs of transferring knowledge to the central office is low and decision rights tend to be delegated to lower levels of the hierarchy when the firm primarily produces knowledge that is costly to transfer to the CEO.<sup>55</sup>

Windsperger's observations raise two points. First, although Windsperger's comments are aimed at the organization of firms, the principle is every bit as relevant for the Forest Service. The information needed to make NEPA decisions can be communicated to a central decision maker, or the authority to make and manage NEPA decisions can be decentralized to field personnel. Or, as discussed below, alternative intermediate or hybrid arrangements might provide for lower overall costs and lead to better decisions.

Second, Windsperger seems to assume that knowledge is necessarily vested in the "lower levels of the hierarchy." But that is not necessarily the case. Let us clarify the difference between "knowledge" and "information." Where the latter refers to data and observations borne of experience, the former is a larger concept that can also encompass technical expertise and understanding. In the case of NEPA, field personnel are likely to have important information about the local natural and social environment, providing context for NEPA decisions. They may also have technical knowledge that is not represented in the central offices. At the same time, personnel in the central offices might have superior knowledge regarding legal and national political issues that are also important for NEPA decision making.

The challenge for the Forest Service is to balance three factors: how much to invest in moving local information and technical knowledge to central decision makers, how much to invest in moving legal and political knowledge to field personnel, and where to locate and how to structure NEPA decision making authority.<sup>56</sup>

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<sup>54</sup> Jensen, M.; W. Meckling. 1995. Specific and General Knowledge, and Organizational Structure. *Journal of Applied Corporate Finance* 8(2): 4-18.

<sup>55</sup> Windsperger. 2002. Organization of Knowledge in Franchising Firms. Paper presented at the DRUID Summer Conference on Industrial Dynamics of the New and Old Economy - Who is Embracing Whom? Copenhagen/Elsinore 6-8 June 2002.

<sup>56</sup> Forest Service directives define what type of NEPA decisions can occur at what levels and delegate decision authority to the appropriate level. In 2006, nearly all NEPA decision documents (99%) were signed at the Forest (22%) and District (77%) office levels. Source: Forest Service's Planning, Appeals, and Litigation System (PALS) database.

a. **The Cost of Transferring Knowledge**

There are two types of knowledge that are important for informed decision making: general and specific. Broadly defined, general knowledge is inexpensive to transmit and specific knowledge is costly to transmit.<sup>57</sup> General knowledge is easily aggregated. Knowledge of Forest Service inventories as represented by statistical summaries, Congressional actions, or even the general provisions of NEPA typify this category of knowledge.

In contrast, specific knowledge is often acquired jointly with the execution of other activities. Specific knowledge includes idiosyncratic knowledge of local circumstances such as the preferences of important parties, the characteristics of specific land areas, and the availability of unemployed resources.<sup>58</sup> Specific knowledge can also include scientific knowledge that can not be easily acquired or comprehended by the lay person.

Specific knowledge can accrue at any level in an organization. Windsperger refers to system specific know-how in a firm as knowledge that relates to broad brand-name assets, including a comprehension of system marketing, organizational promotion, product development, and procurement management activities at the firm level. This is contrasted to local market know-how or outlet-specific assets of the business, such as a comprehension of local advertising, customer service, quality control, and human resource management.<sup>59</sup> In the context of the Forest Service, as discussed above, system specific know-how could encompass the details of NEPA legal requirements passed down by Federal Circuit Courts or the Supreme Court that effect entire Regions or even the National Forest System. Local market know-how might include understanding of local politics, interest groups and ecosystems.

Employees throughout an organization are often exposed to “stimuli (e.g., problems and opportunities) that have strategic implications” for the organization.<sup>60</sup> In this sense, the specific knowledge of foresters at the District and National Forest levels is highly idiosyncratic; it is local market knowledge, such as the condition of wildlife habitat or forest structure, or the attitude of specific stakeholder group. At the same time, the knowledge of the Chief and her management team is also specific, but in contrast to the local knowledge of the field personnel, the central office’s knowledge is associated with the “brand-name” assets, which are those that affect the Forest Service as a whole: Congressional politics, trends in NEPA legal decisions, and strategic plans.

If specific knowledge could be concentrated in the Office of the Chief, then both authority and knowledge could be collocated in the “CEO:” the Forest Service Chief. This would lead to completely informed and coordinated decisions.

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<sup>57</sup> Jensen, M.; W. Meckling. 1995. Specific and General Knowledge, and Organizational Structure. *Journal of Applied Corporate Finance*. 8(2): 4–18.

<sup>58</sup> *Ibid.*

<sup>59</sup> Windsperger. 2002. Organization of Knowledge in Franchising Firms. Paper presented at the DRUID Summer Conference on Industrial Dynamics of the New and Old Economy - Who is Embracing Whom? Copenhagen/Elsinore 6-8 June 2002.

<sup>60</sup> Fredrickson, J. 1986. The Strategic Decision Process and Organizational Structure. *The Academy of Management Review*. 11(2): 280-297, 285.

The problem with specific knowledge, of course, is that it is costly to transfer across distance and personnel. Individuals have limited mental capability; cognitive capacity is a scarce resource.<sup>61</sup> This was expressed by March and Simon as bounded rationality.<sup>62</sup> Alternatively, knowledge is “sticky”; it tends to stay where it is created. More insidious perhaps, knowledge tends to be filtered or preprocessed as it passes from one point to another within an organization.<sup>63</sup>

Certainly, developments in information technology have reduced the cost of gathering and transmitting information. However, it is still the case that knowledge, not information alone, is employed in good decision-making.

In the absence of an unlimited capacity to acquire, store, and process information, decision makers must treat knowledge as a costly resource. The cost and the value of moving information must be balanced against other values such as optimization of decisions and coordination of subunits. Thus, the cost of moving critical or relevant information for decisions determines the degree of centralization.<sup>64</sup>

#### **b. The Cost of Transferring Authority**

To achieve collocation of knowledge and decision making, it is also possible to transfer authority to the location of the relevant information—to decentralize. But here, also, there are difficulties. Ultimately, personnel will act with some degree of self-interest, pursuing objectives that may differ from those of the Chief.<sup>65</sup> Hence, when the Chief delegates responsibility and authority so that knowledge and authority coincide, she is paying in terms of lost consistency in organizational objectives.

Field personnel might deviate from the objectives of the larger organization for any number of reasons. They might have a fundamentally different view of what is best for the organization. Their personal experience, circumstances, or beliefs might simply suggest to them that in their context, a different approach is warranted. Their personal preferences for engaging in or avoiding particular tasks might also influence their decisions. Thus decentralized authority can lead to “goal incongruity” in an organization.

The Forest Service has been called a “bureaucratic superstar” for its reputation as a highly professional, dedicated, and powerful agency that rests largely on a unifying philosophy of shared purpose among its members.<sup>66</sup> In the 1960s, district rangers tended to have very similar views on what constituted appropriate management and shared very common views about their roles. Today significant variability may exist in terms of district rangers and the

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<sup>61</sup> Jensen and Meckling. See also, Williamson 1985.

<sup>62</sup> March, J.; H. Simon. 1958. *Organizations*. New York: John Wiley and Sons.

<sup>63</sup> Fredrickson, J. 1986. *The Strategic Decision Process and Organizational Structure*. *The Academy of Management Review*. 11(2): 280-297.

<sup>64</sup> Windsperger.

<sup>65</sup> Jensen and Meckling.

<sup>66</sup> Clarke, J.N.; and D. McCool. .1996 . *Staking Out the Terrain: Power and Performance among Natural Resource Agencies* . 2nd ed . Albany : State University of New York Press .

context of the units they manage. Although degrees in forestry, natural resource management, or other natural sciences have been the traditional education preparation for rangers, more diversity in educational background and experience is the case in the ranger population today.<sup>67</sup>

### **c. Organizational Structure**

The fundamental structure of an organization is often a response to the important design imperative of collocating knowledge and authority. Fredrickson has suggested three key dimensions to characterizing an organization: complexity, centralization, and formality.<sup>68</sup>

#### **i. Complexity**

Complexity is the condition of being composed of many, usually interrelated parts, with horizontal and vertical differentiation and spatial dispersion. The Forest Service by its very nature is a geographically dispersed organization. With operations throughout the United States, the Forest Service works not only with a wide variety of ecosystems and land types, but a wide range of local economies, cultures, and political organizations as well. Moreover, the structure of the organization, with its Washington and Regional Offices, National Forests and Districts, presents a classic case of vertical differentiation.

The reality of complex organizations leads to several basic propositions:<sup>69</sup>

- “the degree of complexity will be a major determinant of whether members who are initially exposed to [issues of strategic significance] recognize them as having strategic significance”
- “the broad array of members’ preferences or goals does indeed become a series of ‘constraints’ on the decision process”
- “[t]ask specialization accompanies increased complexity, and specialization fosters parochial perceptions. Therefore, it is expected that members in an organization that has a complex structure will have difficulty agreeing on goals, and that the decision process will be iterative and political”
- “the ‘search’ for decision-making information is ‘biased’ because participants’ selective perceptions cause them to focus on information that is salient to the interests of their department or unit.”

Complex organizations like the Forest Service serve constituents with competing values (e.g., timber versus preservation versus grazing rights). In such a context, the agency’s values may be affected in complex and even contradictory ways, depending on whether and to what

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<sup>67</sup> Koontz, T.M. 2007. Federal and State Public Forest Administration in the New Millennium: Revisiting Herbert Kaufman’s The Forest Ranger. *Public Administration Review*. 67(1):152-164.

<sup>68</sup> Fredrickson, J. 1986. The Strategic Decision Process and Organizational Structure. *The Academy of Management Review*. 11(2): 280-297.

<sup>69</sup> *Ibid.* 284.

extent organizational leaders identify or empathize with different constituents. Evidence of mission- or goal-oriented conflict within the Forest Service, driven by organizational complexity, is mixed. For example, based on content analysis of 44 Forest Plans in Regions 1–6 and a survey of officials’ perceptions of forest planning from the same 44 National Forests, Sabatier et al. detected cultural differences and rivaling perspectives among USFS employees. They write:

...planning decisions can be seen as part of a long-standing struggle among at least three coalitions: (1) a Scientific Management Coalition representing Forest Service professionals who shared the Progressive Reform ideas of Gifford Pinchot; (2) a Commodity Coalition, composed of timber companies, ranchers, local government officials, mill workers, many foresters within the USFS... and (3) an Amenity Coalition, composed of environmental groups, water quality agencies...and, increasingly over time, nonforesters within the USFS who sought to limit the adverse effects of commodity production on various amenities.<sup>70</sup>

An alternate view, offered by Twight and Lynden, poses that a dominant feature of Forest Service management is uniformity in organizational leaders’ views on major agency functions. In a survey of 400 forest district rangers, they found a high level of homogeneity in rangers’ views of the Resources Planning Act and its policy functions.<sup>71</sup>

## ii. Centralization

Centralization refers to the degree to which the right to make decisions and evaluate activities is concentrated in a few individuals in the organization, i.e., “a small coalition of top executives.”<sup>72</sup> Although centralization of decision making authority maximizes goal coherence within an organization, it also places the greatest demands upon the management and leadership. This means that the “top management’s cognitive limitations will be the primary constraint on the comprehensiveness of the strategic process.”<sup>73</sup> Using centralization and a coalition of top decision makers as a response to the problems of goal incongruity carries with it several implications:

- “strategic problems and opportunities are likely to go unrecognized and ignored until they appear before a coalition member”
- “under conditions of centralization there are limits to the amount of diversity that can exist in the goals of coalition members”

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<sup>70</sup> Sabatier, P.A.; Loomis, J.; McCarthy, C. 1995. Hierarchical Controls, Professional Norms, Local Constituencies, and Budget Maximization: An Analysis of U.S. Forest Service Planning Decisions. *American Journal of Political Science*. 39(1): 236.

<sup>71</sup> Twight, B.W.; and Lynden, F. 1998. Multiple Use vs. Organizational Commitment. *Forest Science*. 34(2): 474-486.

<sup>72</sup> *Ibid.* 285.

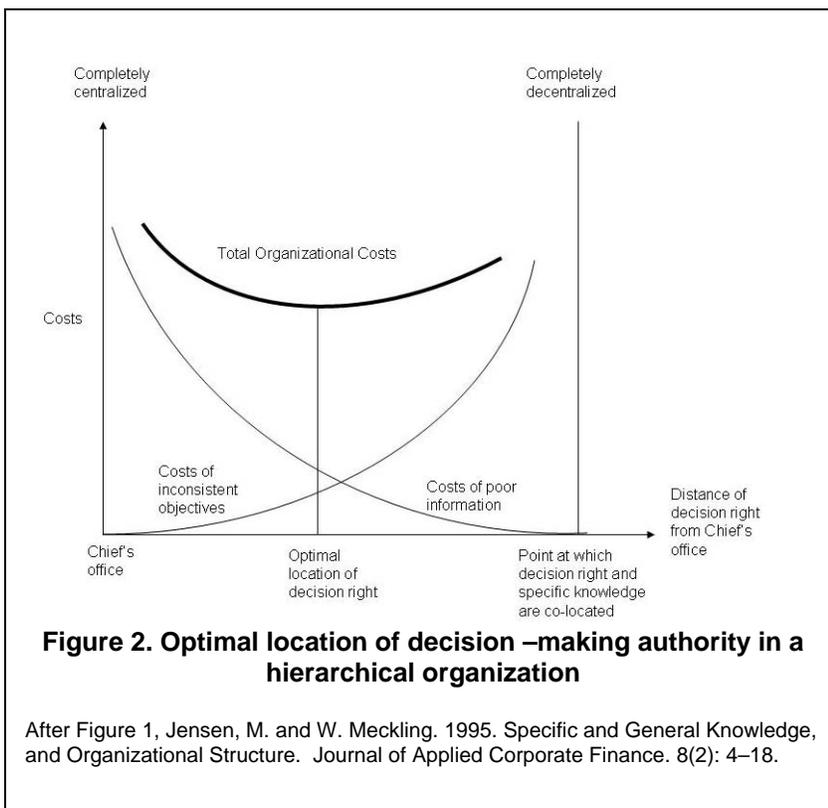
<sup>73</sup> *Ibid.* 282

- “coalition members will exhibit strong commitment to ... goals because they are their own”
- “goals are likely to persist in the face of significant changes in means, and the organization may continue to pursue strategic goals that have been rendered obsolete by changes in the means of competition”
- “uniquely susceptible to” limitations of cognitive structure

Ultimately, the central authority has to recognize and address the tradeoff between imperfect information and inconsistent goals. Figure 2 provides a graphical depiction of the problem. The horizontal axis corresponds to the distance from the Chief’s office at which decision-making authority is vested. A point all the way to the right corresponds to complete decentralization of responsibility, where decisions are assigned to personnel in the field who are most familiar with the conditions relevant to issue. As decisions are increasingly delegated to the field, the costs of poor information decline because the authority is vested in the best informed

personnel. However, at the same time, as discretion in the field increases, the costs of inconsistent objectives and the coping mechanisms to address and control those inconsistencies also increase. In addition, when financial controls are weak, the probability of mismanagement or corruption increases because with decentralization, more actors have discretion over financial and other valuable resources.<sup>74</sup>

The question of how much decentralization



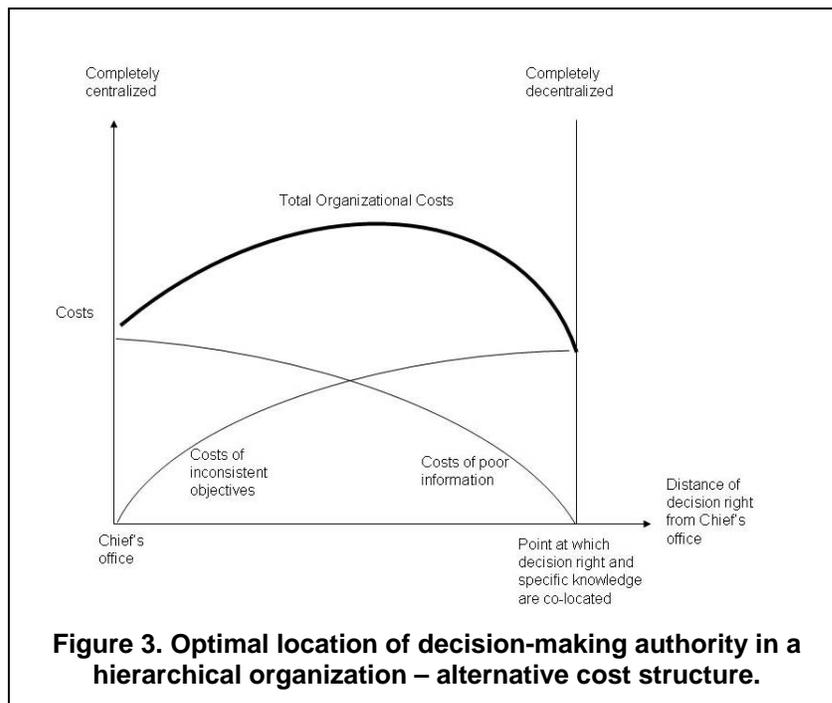
of authority is appropriate revolves around minimizing the sum of the two costs.<sup>75</sup>

<sup>74</sup> Gregersen, H.; Contreras-Hermosilla, A.; White, A.; and Phillips, L. 2004. *Forest Governance in Federal Systems: An Overview of Experiences and Implications for Decentralization*. Jakarta, Indonesia: Center for International Forestry Research; Bliss, F. 2005. *Preventing Corruption in Resource Allocation: Land Reform, Forestry Management, Agriculture Irrigation: A Practical Guide*. Eschborn, Germany: Federal Ministry for Economic Cooperation and Development.

<sup>75</sup> It is also possible that other factors could enter into the optimal location of decision-making authority. By decentralizing decision-making authority, an organization is depending upon the decision-making skills of a

Two observations are relevant. First, Jensen and Meckling suggest that in most cases the optimal location for decisions will be somewhere between the two extremes of complete centralization or decentralization (Figure 2).<sup>76</sup> However, that conclusion is an artifact of the shape of their assumed cost curves. Under another plausible set of costs, it is possible that the optimal decision arrangement would be at one extreme or the other (Figure 3).

Second, and perhaps more germane to the current discussion, the analysis in Jensen and Meckling seems to assume that the superior information set rests with those more distant from the central authority—e.g., with field personnel rather than with the Chief’s office. However, as Windsperger observes, there are both “local market” knowledge and “system specific” knowledge. Where decentralized decision-makers may have an advantage with respect to local knowledge, they are unlikely to have superior system-specific knowledge. Thus it is at least imaginable that the curve for “costs of poor information” could have the opposite slope, thus putting the optimal location of decision authority in the Chief’s office.



It is important to differentiate among the many types of decisions that are made within an organization. Some, but not all, require the specific information of the field personnel. Some, but not all, decisions benefit from decentralization.

The most common example of this difference is the distinction between strategic and operative decisions.<sup>77</sup> In a typical large business organization, strategic

decisions, those that affect the larger organization, are generally centralized in the leaders. The operative decisions such as pricing, human resources, procurement, and marketing are generally shared between the central and field offices.

larger number of employees. If this skill is in scarce supply, centralizing both the skills and the authority may be a rational organizational response. Similarly, if decentralized decision makers are more inclined to game the system, either through pursuit of individual agendas or outright corruption, then decentralization may carry with it additional costs.

<sup>76</sup> Jensen and Meckling.

<sup>77</sup> Windsperger.

To apply this to NEPA in the Forest Service, the interpretation of court case law and the application of it through policy is an example of a corporate or strategic decision. The determination of “significance” of an impact or defining the scope of an analysis is generally an operative decision that is largely completed at the field level with guidance from the central office. Decisions to propose new federal NEPA legislation are best vested in the Chief’s office while decisions on how to manage local interest groups are almost certainly better assigned to field personnel.

### iii. Mitigating Goal Incongruity

There are mechanisms by which a central office, the Chief, can control the range of decisions that her delegates can take.<sup>78</sup> These include monitoring, incentive systems, formalization, and professionalization. Monitoring includes not only tracking specific decisions, but developing and applying metrics of performance. Examples of metrics might include the percent of decisions that result in a lawsuit, the percent of lawsuits lost, the amount of resources expended on implementing plans, or even the level of positive opinion of local interest groups. One of the challenges facing the Forest Service is not only to develop clear goals for the NEPA process, but to identify metrics that indicate success in reaching those goals.

Incentive systems, when linked to effective monitoring, can serve to align the interests of the field personnel with those of the Chief. Salary and budget increases in proportion to performance are but two examples of incentive mechanisms that the central office can employ.

The General Accounting Office heavily criticized the Forest Service in 2003 because it had not developed a performance accountability system that linked budget and organizational structures, planning processes, and resource allocations with its strategic goals, objectives, and performance measures.<sup>79</sup> Since that time the agency has made significant investments to clearly tie budget allocations to performance measurements. The agency has developed a Performance Accountability System and a new performance appraisal system to help the agency measure, monitor, and manage performance.<sup>80</sup> This new five-level performance appraisal system attempts to align employee performance measures to budget work plans that support the agency’s strategic goals.<sup>81</sup>

Formalization refers to the use of rules and procedures to prescribe behavior in response to specific circumstances.<sup>82</sup> Increasing formalism in an organization has several implications:<sup>83</sup>

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<sup>78</sup> Moe, T. 1984. The New Economics of Organization. *American Journal of Political Science*. 28(4): 739-777.

<sup>79</sup> U.S. General Accounting Office. 2003. Forest Service: Little Progress on Performance Accountability Likely unless Management Addresses Key Challenges. [GAO-03-503](#) Washington, D.C.

<sup>80</sup> USDA Forest Service, Intranet site: “[Managing for Results](#)”. Accessed July 5, 2007.

<sup>81</sup> New Performance Management System Update. Internal Forest Service Memo from Hank Kashdan Deputy Chief for Business Operations to All Employees. April 26, 2006.

<sup>82</sup> Fredrickson, J. 1986. The Strategic Decision Process and Organizational Structure. *The Academy of Management Review*. 11(2): 280-297, 286-287.

<sup>83</sup> Ibid.

- “formalized bureaucracies reduce goal incongruities among members and provide reasonably well-defined expectations about performance evaluation ... efficiency criteria will dominate”
- It can “increase the likelihood that information will be sought from areas previously utilized, and that solutions that were successful in the past will be used again”
- It “can also affect how well (individual strategic decisions) are integrated”
- It “increases the likelihood that formalization will be motivated by reactive (e.g., solving problems or crises) as opposed to proactive (e.g., searching for opportunities) behavior”
- “prescribed behaviors (can) become ends in themselves, and means become more important than ends.”

In the context of NEPA compliance, formalization might lead to greater standardization of the EIS and related documents and a reduction in goal incongruities. However, formalization tends to lead to a situation in which the prescribed behaviors become ends in themselves and can hinder decisions that actually are consistent with organizational objectives. This would have the effect of reducing the value of the NEPA process as a community involvement and decision-making tool.

Still another approach to reducing divergence of objectives between the organization’s leaders and its field personnel is the development of professionalization among the ranks. A profession, as distinct from an occupation, is marked by both structural and attitudinal characteristics.<sup>84</sup> Structurally, a profession involves extensive training in dedicated schools, mastery of a technical field of knowledge<sup>85</sup>, the formation of professional associations, and the formation of a code of ethics.<sup>86</sup> The attitude of the professional is just as defining as the structure. This includes identification with the professional organization and colleagues, a sense of calling to the field and belief that it is a service to the public, belief in self-regulation (fellow professionals are best suited to judge the quality of work), and perhaps most importantly, autonomy.<sup>87</sup> Autonomy refers to the capacity to make decisions without external pressures from clients, employers, or other stakeholders who are not members of the profession. A profession involves a shared ethos arising from both training and socialization.<sup>88</sup> Note that increasing formalism threatens professional autonomy.<sup>89</sup>

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<sup>84</sup> Hall, R. 1968. Professionalization and Bureaucratization. *American Sociological Review*. 33(1): 92-104, 92.

<sup>85</sup> Professionalization does not limit itself to the technical fields of scientific and engineering c.f. law or the ministry. See Wilensky, H. 1964. The Professionalization of Everyone? *The American Journal of Sociology*. 70(2): 137-158, 138.

<sup>86</sup> Hall, R. 1968. Professionalization and Bureaucratization. *American Sociological Review*. 33(1): 92-104, 92; Wilensky, H. 1964. The Professionalization of Everyone? *The American Journal of Sociology*. 70(2): 137-158, 138.

<sup>87</sup> Hall, 93. Wilensky, 140.

<sup>88</sup> See the discussion of typology of organizations in the next section for more on the difference between formalization and professionalization.

These means of controlling how subordinates exercise their delegated authority—performance monitoring, formalization, and professionalization—carry with them a cost, just as the pursuit of inconsistent objectives does. Ultimately, the optimal degree of decentralization of decision making depends upon a number of factors including the size of the organization, the sophistication of information technology resources, the rate of change in the operating environment, and the organization’s mechanisms aligning field decisions with the objectives of the larger organization.<sup>90</sup> Interestingly, in private firms, increased government regulation induces an increase in centralization because it requires system-wide specific knowledge of the regulatory agency.<sup>91</sup> Given the increased intervention of the federal courts in the Forest Service’s NEPA environment it could have a similar effect, suggesting greater central control of the NEPA activities.

#### **iv. Typology of Organizations**

Given the three key dimensions for characterizing organizations—complexity, centralization, and formalization—it is possible to build a typology.<sup>92</sup> Figure 4 provides a depiction of the three most commonly observed of the possible combinations. The Simple Structure tends to arise in small organizations, characterized by informality and authority vested in a single executive. “[I]t has little or no technical or administrative staff, little differentiation between units, a ‘loose’ division of labor, and a very small managerial hierarchy.”<sup>93</sup> Small start-up companies typify the Simple Structure organization. Clearly, the Simple Structure has little in common with any imaginable organizational structure for the Forest Service.<sup>94</sup>

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<sup>89</sup> There is, however, some debate in the literature about whether increased formalism stifles autonomy and innovation. See, e.g., P. S. Adler and B. Borys. 1996. Two Types of Bureaucracy: Enabling and Coercive. *Administrative Science Quarterly*, vol. 41.

<sup>90</sup> Jensen and Meckling.

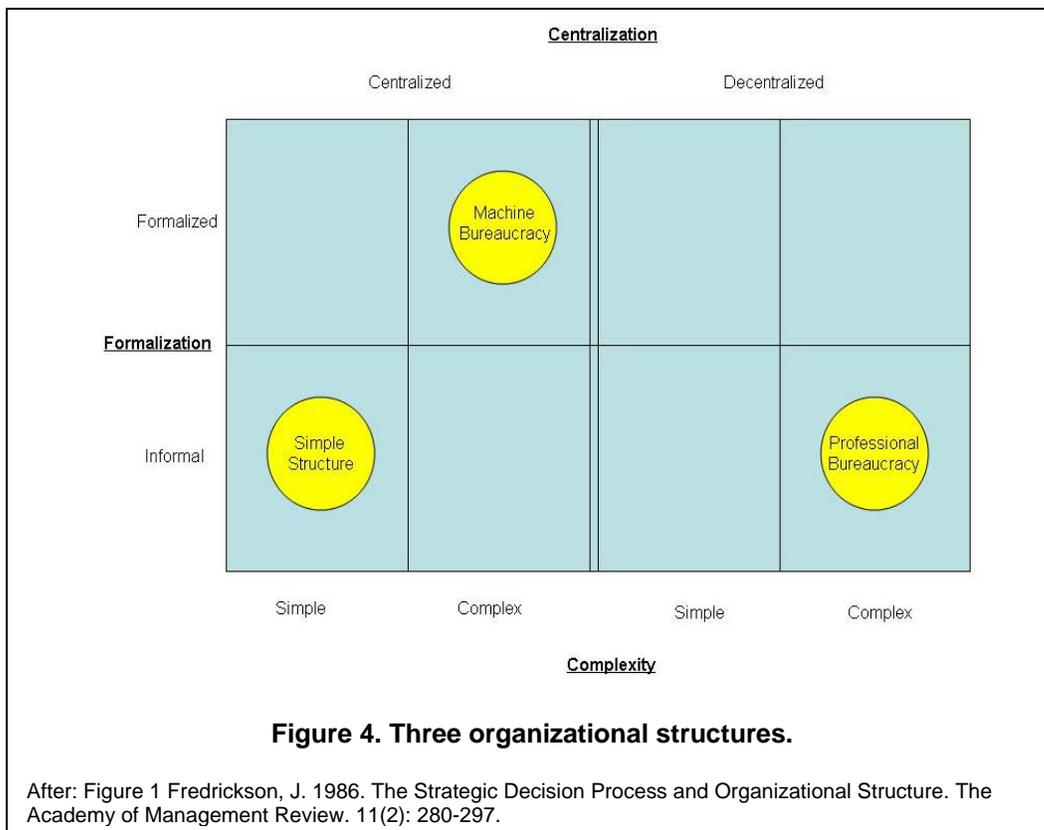
<sup>91</sup> *Ibid.*

<sup>92</sup> Fredrickson, J. 291

<sup>93</sup> *Ibid.*

<sup>94</sup> It might, however, be interesting to explore whether District Rangers still view Forest Districts as simple structures.

The other two dominant organization types are the Machine Bureaucracy and the Professional Bureaucracy. Both are complex organizations. But where the Machine Bureaucracy responds to complexity through centralization and formality, the Professional Bureaucracy manages via decentralization and informality. The former is characterized by “large, functionally grouped units at its lower levels, as well as an elaborate administrative staff.”<sup>95</sup> The latter relies on “highly trained professionals who control their own work, so the structure can accurately be described as very decentralized.”<sup>96</sup> New strategic initiatives in the Machine Bureaucracy arise only from central response to changes in formally monitored variables. In the decentralized Professional Bureaucracy, individuals initiate strategic actions



following “extensive political bargaining among members”.<sup>97</sup> The variety of interests and relatively horizontal nature of the Professional Bureaucracy make it more difficult to develop and implement single congruent decisions that are universally adopted throughout the organization.

The Machine Bureaucracy functions best in a “simple, stable environment.”<sup>98</sup> It is not responsive to subtle changes in its operating environment. The Professional Bureaucracy achieves its own stability by advanced training of its personnel with enduring, adaptive skills.

<sup>95</sup> Ibid. 292.

<sup>96</sup> Ibid. 293.

<sup>97</sup> Ibid.

<sup>98</sup> Ibid.

The autonomy within the professional organization contrasts sharply with the formalism of the bureaucracy:

[T]he bureaucracy is organized on a functional basis, with each worker doing only a part, and capable of doing only a part; training for the worker tends to take place within the agency and to be of short duration; control and coordination of workers is by a system of rules and exists external to the worker. Within the professional organizational model, the organization itself reflects the structure of the profession; separation of functions will be seen as a staff/line division, with each professional worker completing a professionally defined unit of work which he is capable of doing completely; training is external to the organization and usually of longer duration; controls and coordination of workers is based on their internalizing norms and standards, in conjunction with colleague supervision.<sup>99</sup>

How does this relate to the Forest Service? Is the Forest Service a Professional Bureaucracy or a Machine Bureaucracy? As mentioned previously the Forest Service is a highly complex system and it is sometimes difficult to determine which factors are causal and which are simply reinforcing.<sup>100</sup> The Forest Service was built upon the principles of a Progressive Reform model which relies heavily on a system of hierarchical controls and a belief that technically competent professionals should lead the organization.<sup>101</sup> These traits are consistent with a Professional Bureaucracy.<sup>102</sup>

Consider this observation about the forestry professionals' sense of autonomy from 40 years ago:

A forester of considerable professional status expounded that ethic to my class of freshman foresters recently when he said: "We must have enough

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<sup>99</sup> Carte, G. 1969. Evaluation of Professionalism Within the Criminal Justice System. *Criminology*. 7(2): 39-50.

<sup>100</sup> U. S. Department of Agriculture, Forest Service. 2007. Integrating Mission Accomplishment with Safety at the U. S. Forest Service: Diagnostic Memo, Discussion Draft. Completed by Dialogos International. Cambridge, MA.

<sup>101</sup> Sabatier, P. A.; Loomis, J.; and McCarthy, C. 1995. Hierarchical Controls, Professional Norms, Local Constituencies, and Budget Maximization: An Analysis of U.S. Forest Service Planning Decisions. *American Journal of Political Science*. Vol. 39(1): 204-242.

<sup>102</sup> Note however, the notion of a professional forester emerged from humble roots. Consider this account from a career forest ranger: "When the Forest Service was created, there were no forestry schools in the West. The men who applied for jobs were cowpunchers, miners, loggers...I doubt some of them even had a high school education, and they didn't need one. They just had to take this old Ranger Exam that pretty much amounted to showing that they could saddle a horse, shoe a horse, pack a horse and pack it right.... Early rangers didn't have to know all that much because they had two manuals that told them everything. One manual was maybe two inches thick, and the other one was smaller, and they were done up in a heavy buckskin-colored canvas.... Rangers called these two volumes the Buckskin Bibles, and they were it: you had all your regulations; you had all your laws; everything you needed to run your district was in those two books. The smaller one, you carried with you all the time in your saddle bags. It contained primarily regulations regarding timber trespass, range trespass... everything pertaining to administration. The other volume was fiscal regulations." (Murchie, A. with King, R.T. 2002. *The Free Life of a Ranger: A Forest Service Memoir*. Reno, Nevada: University of Nevada Oral History Program, pp. 305-306.

guts to stand up and tell the public how their land should be managed. As professional foresters, we know what's best for the land."<sup>103</sup>

But gradually, starting with the passage of the Multiple-Use Sustained-Yield Act of 1960 and continuing with subsequent legislative acts such as NEPA in 1970 and the National Forest Management Act of 1976, the Forest Service was required to involve the public in decisions about policy, land use, and resource management. It is not overstating the case to say that the history of public involvement has been tumultuous.<sup>104</sup> As Luckert states it, "Although many foresters perceived themselves as being in control of forests, the public had other ideas, seeing foresters as public representatives for managing a public resource."<sup>105</sup>

The Forest Service historically has had a high degree of organizational autonomy and independence. As one forest ranger in the sample observed, "You know, Woody, a ranger back in the thirties, he did anything he wanted. Hell, we were gods. Nobody questioned us." However, the traditional autonomy of the Forest Service has been threatened in the past decade. Both the National Environmental Policy Act of 1969 and NFMA substantially increased the involvement of the public as well as other government agencies in forest planning. The level of conflict associated with forest management also has risen dramatically as the nation's environmental constituency has grown and mobilized, and as unresolved wilderness issues have continued to smolder in many states (citations omitted).<sup>106</sup>

This inevitably impinged on the forestry professionals' sense of autonomy. Administrative challenges, court proceedings, and even alternative dispute resolution challenged "traditional norms and role expectation."<sup>107</sup> Since the 1960s when the forestry profession was at the height of its status, a variety of social changes have occurred that have affected the agency's environmental decision process. Over the past three decades, many of these changes have been expressed through the court system<sup>108</sup> which in turn has led to a stronger emphasis on standardization of several activities surrounding this decision process in an effort to "bullet proof" the final outcome.<sup>109</sup> It appears that as the Forest Service and forestry professionals have struggled with the new, constrained, decision-making environment, both the leadership of the Forest Service and the federal courts have turned to rules and formalism to control what was once the realm of professional judgment.

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<sup>103</sup> Behan, R. 1966. The Myth of the Omnipotent Forester. *Journal of Forestry*. 64(6): 398-407.

<sup>104</sup> Leach, W. 2006. Public Involvement in USDA Forest Service Policymaking: A Literature Review. *Journal of Forestry*. 104(1): 43-49, 43.

<sup>105</sup> Luckert, M. 2006. Has the Myth of the Omnipotent Forester Become the Reality of the Impotent Forester? *Journal of Forestry*. 104(6): 299-306

<sup>106</sup> Manring, N. 1994. ADR and Administrative Responsiveness: Challenges for Public Administrators. *Public Administration Review*. 54(2):197-203, 199.

<sup>107</sup> Ibid.

<sup>108</sup> Jones, E. and Taylor, C. 1995. Litigating Agency Change: The Impact of the Courts and Administrative Appeals Process on the Forest Service. *Policy Studies Journal*. Vol 23 (2): 210-336.

<sup>109</sup> Lachapelle, P.R.; McCool, S.F.; and Patterson, M.E. 2003. Barriers to Effective Natural Resource Planning in a "Messy" World. *Society and Natural Resources*. 16: 473-490.

We use the term forester and forestry professional interchangeably here. However, not all forestry professionals are trained specifically in forestry. Other professions represented in the ranks of the Forest Service include engineers, hydrologists, biologists, and anthropologists as well as public administrators, business administrators, and lawyers. These professionals are drawn from the ranks of both the science and social sciences. This multiplicity of professional backgrounds only increases the challenges of using professionalization as a means of increasing the consistency of goals among field personnel. As former Chief of the Forest Service, Jack Ward Thomas noted, “The agency needs a new dominant professional.”<sup>110</sup> Such is the challenge of a managing a complex organization.

It has been observed that it is the presence of a well-developed professional base that has allowed the Forest Service to adjust to changes and absorb new responsibilities.<sup>111</sup> Even among the professionals most closely identified with the mission of the Forest Service—foresters—their development may not have kept pace with the changes in their organizational environment. It may be necessary for the profession to help its members develop new skills such as public engagement, contract management, and legal interpretation: skills that were not so germane to the profession four decades ago. At the same time, the ethos and purpose at the core of the profession is seeing a shift as the goals of the forester in the public realm shift from primarily silviculture to multiple use.

Unlike some organizations that employ professionals, however, the Forest Service may have more influence over the process and direction of professional development in its personnel. “There is no lateral entry into the service; all line officers work their way up from the bottom, giving them a common background and view.”<sup>112</sup>

Over the past twenty years greater standardization of certain business functions has also increased. An example is the current personnel classification system which requires a 75 percent correct response rate to self-rating criteria factors for an applicant to be rated as highly qualified. The irony is that the criteria are not selected by an individual who has specialized knowledge of the position. Instead, they are derived from a standardized model. The implicit assumption is that the skills needed to perform a specialized task are the same regardless of external influences which is a mechanical approach. The agency is experiencing conflict over its identity and roots of its existence. The natural response to this from Progressive era bureaucracy is resistance to change and a staunch fight against standardization due to the belief that “we know best”.<sup>113</sup>

Thus the Forest Service can not be clearly categorized as either a Machine Bureaucracy or a Professional Bureaucracy. Rather, it would appear that much of the professionalism that arises from a cadre of workers with shared values, goals, and technical training is giving way

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<sup>110</sup> Clarke, J.N.; and D. McCool . 1996 . *Staking Out the Terrain: Power and Performance among Natural Resource Agencies* . 2nd ed . Albany : State University of New York Press . p 9.

<sup>111</sup> *Ibid.* 215.

<sup>112</sup> Culhane. 1981. *Public Lands Politics: Interest Group Influence on the Forest Service and the Bureau of Land Management*. John Hopkins University Press.

<sup>113</sup> U. S. Department of Agriculture, Forest Service. 2007. *Integrating Mission Accomplishment with Safety at the U. S. Forest Service: Diagnostic Memo, Discussion Draft*. Completed by Dialogos International. Cambridge, MA.

to increasing formalization. It would appear that, whether by design or evolutionary drift, the agency is in transition toward a Machine Bureaucracy.

## **6. Basic Principles for External Contracting**

Turning now from the vertical (hierarchical) dimension of Figure 1 to the horizontal (multiple organizations) dimension, we start to address the basic “make or buy” question. In our new “The World is Flat”<sup>114</sup> environment it is not surprising that the U.S. Government is directing its agencies to conduct analyses to assure that their commercial activities are “subject to the forces of competition.”<sup>115</sup> OMB Circular A-76, discussed above, provides both policy direction and implementation instruction regarding how activities are to be inventoried, categorized as either commercial or inherently governmental, and how commercial activities are to be subject to competition.

What is missing from the OMB directive is a detailed discussion of what distinguishes the inherently governmental from the commercial. The A-76 directions include the following on identifying inherently governmental activities:

An inherently governmental activity is an activity that is so intimately related to the public interest as to mandate performance by government personnel. These activities require the exercise of substantial discretion in applying government authority and/or in making decisions for the government. Inherently governmental activities normally fall into two categories: the exercise of sovereign government authority or the establishment of procedures and processes related to the oversight of monetary transactions or entitlements.

In distinguishing a commercial activity from an inherently government activity, OMB offers a nearly tautological explanation.

A commercial activity is a recurring service that could be performed by the private sector and is resourced, performed, and controlled by the agency through performance by government personnel, a contract, or a fee-for-service agreement. A commercial activity is not so intimately related to the public interest as to mandate performance by government personnel. Commercial activities may be found within, or throughout, organizations that perform inherently governmental activities or classified work.

Moreover the OMB circular offers scant explanation of why the government’s commercial activities should be subject to the forces of competition in the market place.<sup>116</sup> Conversely, there is no discussion of whether there are certain types of activities that may seem

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<sup>114</sup> See, Friedman, T. 2006. *The World is Flat: A Brief History of the Twenty-First Century*. Farrar, Strauss Giroux, New York; discussing the increased use of outsourcing and partnering in the global economy.

<sup>115</sup> Office of Management and Budget, Executive Office of the President, Circular No. A-76 (Revised) May 29, 2003.

<sup>116</sup> Even without the OMB mandate the agency has a vested interest in determining a more efficient organization in order to improve its social, political, and financial capital.

commercial in nature that, for reasons of management or economy, are better performed in-house.

In this sense the OMB mandate raises, without actually addressing, the classic “make or buy” decision that every firm and organization faces. Which goods and services are best produced within the organization’s operations and which are better purchased in the competitive market place? To explore this question we turn to the New Institutional Economics (also referred to as transaction cost economics) literature, as well as the literature on privatization of government services.

**a. Why the market?**

When an organization requires goods or services to pursue its objectives, it must determine which ones it will produce itself and which it will purchase outside its own boundaries. There are two primary advantages to purchasing through the market:

“(1) Markets promote high-powered incentives and restrain bureaucratic distortions more effectively than internal organization; (2) markets can sometimes aggregate demands to advantage, thereby to realize economies of scale and scope.”<sup>117</sup>

The high-powered incentives of the marketplace arise from the fixed-price nature of the market place or contract. Where a producer of goods or services faces a fixed price with certainty, then any gains in production efficiency accrue to the economic advantage of the producer in the form of cost savings, leading to an increase in net revenue. Contrast that to the incentive structure of the government bureaucrat who observes an opportunity to increase production efficiency. Who realizes the benefits? To the extent that the bureaucrat benefits at all, it is only indirectly through praise and the hope for eventual promotion. The economic incentives for the bureaucrat to actively invest energy in process improvements are weak at best.<sup>118</sup>

The other advantage that the market place offers is that of aggregating the production of similar goods and services across multiple consumers. To see this, consider the case of web page development services. If an organization is sufficiently large, it might be able to employ a web page developer, keeping that individual fully occupied. But consider the small firm or organization. Its demand for web page services might be sufficiently small that the employee would mostly sit idle. Now consider a more specialized service such as wire-binding of reports. Even a large organization may only have an occasional need for this service and the special equipment and skills it requires. The market place offers a mechanism by which many organizations can share in the costs and the benefits of this service.

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<sup>117</sup> Williamson, O. 1985. *The Economic Institutions of Capitalism*. Free Press, New York. p. 90.

<sup>118</sup> For a discussion of budget maximizing as the primary goal in bureaucracies see Niskanen, W. 1971. *Bureaucracy and Representative Government*. Chicago: Aldine.

The same observation is as true for human capital as it is for physical capital and equipment. If an organization requires the services of a particular trade or profession, it can bring a person with the appropriate skills on to the payroll or hire the services through the market. Hence, some firms have in-house legal counsel while others hire the services of a firm.

An important note with respect to the economies of scale must be made, however: these can only be realized where the good or service in question is valued by multiple consumers. If an organization is demanding a good or service that is unique, then there is no opportunity for aggregation of that demand with other consumers. This raises the important question of whether a contractor providing NEPA services to the Forest Service is so highly specialized that issues of economies of scale and scope can be ignored.

### **b. The Costs of External Contracting**

If the market provides the advantages of high-powered incentives, why would a cost-minimizing government agency ever select an internal hierarchical approach? Perhaps because the transaction costs of contracts can, under certain circumstances, threaten to offset their production cost advantages. The transaction cost economics literature recognizes two categories of transaction costs: measurement costs and governance costs.<sup>119</sup> Measurement costs refer to the resources dedicated to monitoring and evaluating performance.<sup>120</sup> Governance costs are the costs of establishing and maintaining mechanisms to resolve conflict and adapt to changes.<sup>121</sup> These include the costs of initially exploring the contract, gathering the needed information, and negotiating contract parameters among the contracting parties.

One conclusion of the transaction cost literature is that developing mechanisms under which control of production decisions is shared by parties to the transaction is often more efficient than vesting all control in only one of the parties.<sup>122</sup>

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<sup>119</sup> See Williamson at 26-29 (describing transaction cost economics as having two branches: a measurement branch and a governance branch). This report employs the language and conceptual framework of Williamsonian transaction cost economics, as opposed to the different terminology used by North and others. Compare *id.* with D.C. North. 1981. Structure and change in economic history. p. 39: "The resource costs devoted to compliance differ with alternative forms of organized economic activity. These compliance costs consist of the costs of measurement in alternative organizational forms and the costs of enforcing an agreement." (hereinafter North, Structure & Change); and D.C. North. 1990. Institutions, institutional change, and economic performance. p. 27: "The costliness of information is the key to the costs of transacting, which consists of measuring the valuable attributes of what is being exchanged and the costs of protecting rights and policing and enforcing agreements. These measurement and enforcement costs are the sources of social, political, and economic institutions." (hereinafter North, Institutional Change); and North, Institutional Economics at 5: "[T]ransaction costs are only two things: (1) the costs of measuring the dimensions of whatever it is that is being produced or exchanged and (2) the costs of enforcement." North has referred to his brand of transaction cost economics as the "University of Washington approach" when distinguishing his approach from that of Williamson. North, Institutional change, *supra*, at 27 n.1.

<sup>120</sup> See Williamson at 29.

<sup>121</sup> See Williamson at 18-32.

<sup>122</sup> See Williamson at 129: "The study of transaction cost economizing entails an examination of alternative ways by which to govern exchange interfaces. Firms, markets, and *mixed modes* are recognized as alternative instruments of governance." (emphasis added).

## i. Measurement Costs

A contract is “an agreement between two or more parties that creates in each party a duty to do or not do something and a right to performance of the other's duty or a remedy for the breach of the other's duty”.<sup>123</sup> A contract also requires “consideration,” i.e., some form of payment or other value received, and a “meeting of the minds,” i.e., “assent to the mutually agreed upon and understood terms of an agreement by the parties to a contract that may be manifest by objective signs of intent (as conduct).”<sup>124</sup>

In any contract it is necessary to be able to gauge the extent to which the promised good or service has been delivered. In the case of a simple commodity, such as #2 leaded pencils, this is a fairly simple task. Either the required quantity of pencils, meeting the pertinent quality specifications, was delivered or it was not. Measurement in this situation hardly arises as an issue.

But in some cases, particularly for services, the problem of measurement is real. Consider the case of a web site designer building an organization's web site. Certainly it is possible to tell whether the site as constructed has the requisite number of pages, whether it covers the agreed upon topics, and whether the links among pages operate as promised. But issues of quality and craftsmanship are more elusive. Did the contractor use the requisite care and artistry in web page layout, writing, and illustrations? These are harder to gauge. Consider how much more difficult it might be to measure performance in a Defense Department contract to design and build a new weapons system.

Potentially more elusive still are efforts to gauge the quality of service-oriented contracts (as opposed to goods-oriented contracts) and knowledge-intensive contracts. Some NEPA functions are at once service-oriented and knowledge-intensive. Consider, for example, the vital matter of deciding whether or not to perform an EIS (see section 7 below for an elaboration of this point). A contractor retained to answer this question is providing a knowledge-intensive service. Apart from retracing the analytical steps performed by the contractor, the Forest Service may be hard-pressed to evaluate the comprehensiveness and quality of the service provided by the contractor. This challenge is reflected in the observations of Region 1 Forest Service employees recounting experiences with contractors:

...NEPA contractors are in business to make a profit...we get work that we feel is not sufficient, and the contractor wants more money to do more work...do not think that many people outside the Forest Service and the environmental community have a good understanding about what it takes to get a major vegetation management process through the NEPA process, appeals and court...it is a challenge to convey quality expectations to a

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<sup>123</sup> FindLaw at <http://dictionary.lp.findlaw.com/scripts/results.pl?co=dictionary.lp.findlaw.com&topic=f7/f7ccc74f67d3190981bde08a84e76793>.

<sup>124</sup> Ibid at <http://dictionary.lp.findlaw.com/scripts/results.pl?co=dictionary.lp.findlaw.com&topic=7a/7a29f96bdb29a21dbfa5301a92470017>.

contractor, and next to impossible to write a contract that specifies a certain level of quality.<sup>125</sup>

Measurement in a contract setting then is “concerned with the ways by which better to assure a closer correspondence between deeds and awards (or value and price).”<sup>126</sup> To be sure, there are many mechanisms to help with this aspect of contracting, but the important observation is that they all carry costs. As such, they increase the cost of going to the market to secure a good or service.

## ii. Governance Costs

If measurement costs deal with the buyer’s relation to the good or service it seeks, then governance costs are associated with the buyer’s relation to the other party or parties to the contract. Governance costs refer to those costs associated with the mechanisms that are established to resolve conflicts, provide necessary guarantees, and adapt to changes.

Under the classic conception of contract, disputes are handled through reliance on the courts.

**Table 1: Assumptions Underlying Transaction Cost Economics**

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| <p><b>1. Assumptions about the Parties:</b></p> <ul style="list-style-type: none"><li>a. Bounded Rationality</li><li>b. Opportunistic Behavior</li></ul> <p><b>2. Assumptions about the Transaction:</b></p> <ul style="list-style-type: none"><li>a. Asset Specificity</li><li>b. Uncertainty</li></ul> |
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The emphasis on litigation-based resolution of conflict, however, does not adequately address the tensions that arise in more complicated, nonstandard arrangements. The contracting buyer must balance an interest in: (1) encouraging the contracted producer to invest in the specialized assets that will most cost-effectively provide the good or service; (2) providing the producers the flexibility and discretion they need to innovate; and (3) providing both parties the flexibility to adapt the contract in response to changes in knowledge, technology, circumstances, and preferences. The tension among these goals is, however, addressed in the treatment of governance costs by the New Institutional Economics literature.

Transaction costs become important only when the parties to a transaction<sup>127</sup> and the transaction itself both exhibit certain characteristics (see Table 1).<sup>128</sup> The behavioral assumptions about parties to a transaction that motivate the analysis of transaction costs are *bounded rationality* and *opportunism*.<sup>129</sup> Bounded rationality, discussed above in the context

<sup>125</sup> “Past NEPA Contracting Experiences – Region 1”, anonymous internal document, posted to Region 1 intranet. Copy on file with authors.

<sup>126</sup> Williamson 1985 at 81.

<sup>127</sup> In the discussion that follows, the term "transaction" is used in its broadest sense- namely, to describe a transaction between parties. In this sense the transaction is the object of a contract.

<sup>128</sup> See Williamson at 44-61.

<sup>129</sup> See *id.* at 45-49; O.E. Williamson. 2000. Economic Institutions and Development: A View from the Bottom. In Mancur Olsen & Satu Kähkönen., eds. 2000. A Not-So-Dismal Science: A Broader View of Economies and Societies. Pps. (hereinafter Williamson, A View from the Bottom).

of knowledge transfer within an organization, refers to the cognitive limits of the parties: it characterizes the mind as a scarce resource.<sup>130</sup> This is the same constraint that limits the capacity of the CEO or the coalition of top managers in accumulating all the information needed for an organization's decision making. If parties could identify and negotiate through every possible contingency to a transaction, a possibility assumed by classical contract doctrine,<sup>131</sup> then the issues addressed by transaction cost economics would disappear.<sup>132</sup> However, given bounded rationality, parties involved in a transaction cannot conceive of all possible contingencies and address them in a comprehensive agreement.<sup>133</sup> The more complex is the transaction, the more important is the role of bounded rationality. This assumption does not imply that parties are irrational or nonrational. Rather they intend to act with rationality but are limited in cognitive capacity.<sup>134</sup> Thus, bounded rationality does not question parties' rationality, but rather their omniscience.

The second behavioral assumption relates to what Williamson refers to as the parties' "self-interest orientation."<sup>135</sup> The strongest form of self-interest, opportunism (defined as self-interest coupled with guile), underlies transaction cost analysis.<sup>136</sup> Opportunism goes beyond simple self-interest seeking, which is the assumption that parties will attempt to gather the wealth and advantages that their skills and assets afford them but will always act openly and honestly.<sup>137</sup> Opportunism, as the term is used in New Institutional Economics, suggests that parties will also "mislead, distort, disguise, obfuscate, or otherwise confuse"<sup>138</sup> when it is to their advantage to do so.<sup>139</sup>

The choice of optimal governance structure also depends upon the nature of the transaction itself. Two important characteristics of transactions are the degree of *asset specificity* and the level of *uncertainty*.<sup>140</sup> Asset specificity refers to the extent to which the resources used to

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<sup>130</sup> See Williamson at 45, 46 n.6.

<sup>131</sup> See *id.* at 69.

<sup>132</sup> See *id.* at 50 ("Of special importance is that transaction cost economics pairs a semi-strong form of cognitive competence (bounded rationality) with a strong motivational assumption (opportunism). Without *both*, the major problems of economic organization [addressed by transaction cost economics] would vanish or be vastly transformed.").

<sup>133</sup> See *id.* at 46 ("Comprehensive contracting is not a realistic organizational alternative when provision for bounded rationality is made.").

<sup>134</sup> See *id.* at 45: "[A]ctors are assumed to be '*intendedly* rational, but only *limitedly* so.'" (quoting H. Simon, 1985. Human Nature in Politics: The Dialogue of Psychology with Political Science. *Am. Pol. Sci. Rev.* 79: 293, 303); Williamson, *A View from the Bottom* at 96 (quoting same passage).

<sup>135</sup> Williamson at 47.

<sup>136</sup> See *id.* ("By opportunism I mean self-interest seeking with guile. This includes but is scarcely limited to more blatant forms, such as lying, stealing, and cheating. Opportunism more often involves subtle forms of deceit."). See also Posner, 1998. *Economic Analysis of Law* (5<sup>th</sup> Edition) at 103 (describing opportunism as "trying to take advantage of the vulnerabilities created by the sequential character of contractual performance."); North, *Structure & Change* at 36 (describing opportunism as "the ability of one party to an exchange to benefit at the expense of the other party by violating the agreement in his or her post-contractual behavior").

<sup>137</sup> See Williamson at 49

<sup>138</sup> *Id.* at 47

<sup>139</sup> Adverse selection and moral hazard are two specific manifestations of the presence of opportunistic behavior. See *id.*

<sup>140</sup> See *id.* at 52, 56.

produce the object of the transaction are idiosyncratic to the transaction.<sup>141</sup> In Williamson's words,

[A]sset specificity refers to durable investments that are undertaken in support of particular transactions, the opportunity cost of which investments is much lower in best alternative uses or by alternative users should the original transaction be prematurely terminated . . . .<sup>142</sup>

Although asset specificity is the most important characteristic of the transaction for this type of analysis, uncertainty is also important.<sup>143</sup> When a transaction involves uncertainty and the parties are subject to bounded rationality, adaptability of the transaction is crucial. If there is no uncertainty in the future, or uncertainty exists but all possible outcomes can be anticipated, a detailed agreement or set of rules could cover all contingencies. Or, if there is no opportunism, a general rule stating how sharing arrangements for joint gains from new opportunities could lead to efficient actions. However, the combination of bounded rationality and opportunism in the presence of uncertainty means that it is unlikely that parties will easily adapt to, and exploit opportunities arising from unanticipated changes in the world.

Natural resource management planning is typified by multiple and competing goals, little scientific agreement on cause-effect relationships, limited time and resources, lack of information, and structural inequalities in access to information and the distribution of political power.<sup>144</sup> The Forest Service operates in an environment where there are frequent changes that relate to and affect the planning process. Some of these changes are within the control or authority of the agency or other governing agencies such as policy or rule changes. An example here would be the listing of a new threatened or endangered species or the expansion of critical habitat. Uncertainty also arises from environmental and local circumstances such as an event that changes the make up of the forest like fire, a large windstorm, an epidemic outbreak of forest insects, or disease. Still others are information- or knowledge-based, such as the discovery of archeological features or a pair of nesting sensitive species, or a recent court ruling that dictates a new “standard” of analysis. These types of potential changes place stresses on the contractual relationship that surround NEPA activities, since generally most of these changes are not foreseen and are hard to identify and quantify in the original statement of work. Successful planning is often defined in broad terms and is generally more than simply producing a product, such as an environmental assessment, or even implementation of a project. Successful projects include process-oriented measures such as learning, responsibility, relationship representation.<sup>145</sup>

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<sup>141</sup> Williamson identifies four categories of asset specificity: site specificity, physical asset specificity, human asset specificity, and dedicated assets. See *id.* at 55. See also S. Globerman and A Vining. 1996. A Framework for Evaluating the Government Contracting-Out Decision with an Application to Information Technology. *Public Administration Review*. 56(6): 577-586, at 580.

<sup>142</sup> *Ibid.*

<sup>143</sup> See *id.* at 56-57.

<sup>144</sup> Lachapelle, P.R.; McCool, S.F.; and Patterson, M.E. 2003. Barriers to Effective Natural Resource Planning in a “Messy” World. *Society and Natural Resources*. 16:473-490.

<sup>145</sup> McCool, S. F., and K. Guthrie. 2001. Mapping the dimensions of successful public participation in messy natural resources management situations. *Society and Natural Resources*. 14(4):309-323.

Uncertainty contributes a central explanation for the imprecise nature of the transaction building, and interest agreements. Williamson recognizes both state-contingent uncertainty and behavioral uncertainty.<sup>146</sup> While the former arises from changes in the state of the world, the latter relates to either the limits of communication (non-strategic) or the potential for parties to a transaction to use information to their advantage (strategic). Williamson is primarily concerned with uncertainty arising from strategic behavior. For transaction cost analysis to be of interest it is not necessary that parties actually behave strategically, but only that they might. Note, however, that behavioral uncertainty is only of interest in the case where there is also the potential for exogenous disturbances requiring adaptation, i.e., state-contingent uncertainty.<sup>147</sup>

How can the contracting parties address each other's concerns about opportunistic behavior that might prevent them from investing in cost-effective, specialized production activities? First, they could seek mechanisms to make credible commitments against opportunistic behavior.<sup>148</sup> But effective commitments can be costly. Alternatively, the buyer can forgo the market transaction entirely and revert to internal production. In the context of private transactions involving both idiosyncratic (specialized) investments and uncertainty, Williamson notes the advantages of hierarchical arrangements:

Incentives for trading weaken as transactions become progressively more idiosyncratic . . . . The choice of mode then turns entirely on which mode has superior adaptive properties . . . . The advantage of vertical integration is that adaptations can be made in a sequential way without the need to consult, complete, or revise interfirm agreements.<sup>149</sup>

Thus the buyer may want to employ internal production if it anticipates the need to adapt its purchases to changes in information or changes in goals. This adaptability comes at a price, however. The hierarchical approach sacrifices the "high-powered incentives" present in the other governance structures to gain the adaptability of internal control.

The choice of governance structure may also have a dynamic element if the level of uncertainty can be reduced through experience. As Williamson notes,

To the extent that uncertainty decreases as an industry matures, which is the usual case, the benefits that accrue to internal organization (vertical integration) presumably decline. Accordingly, greater reliance on market procurement is commonly feasible for transactions of recurrent trading in mature industries.<sup>150</sup>

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<sup>146</sup> See *id.* at 57-58.

<sup>147</sup> See *id.* at 59.

<sup>148</sup> See Sappington & Stiglitz. 1986. Privitization, Information and Incentives. *J. Policy Analysis and Management*. 6: 567 (1986), at 574; Williamson at 168.

<sup>149</sup> Williamson, at 78. When Williamson refers to "organizing mode," he is distinguishing between "bilateral structures where the autonomy of the parties is maintained and unified structures, where the transaction is removed from the market and organized with . . . an authority relation (vertical integration)." *Id.* at 75-76. Hence, Williamson differentiates between decentralized discretion and hierarchical control.

<sup>150</sup> *Id.* at 80

Similarly, if an organization requires a new service it may be that in the early stages of implementation, uncertainty and the inability to provide credible commitments against opportunistic behavior will favor hierarchical arrangements. With experience and decreased uncertainty, it may be possible to shift toward the incentive-based market-provision of that good or service.

Sappington and Stiglitz argue that the most important difference between private and public provision of goods and services is the transaction costs associated with intervention by the government in the production activities.<sup>151</sup> Unlike private production, public provision leaves the government with residual rights to intervene.<sup>152</sup> For example, if the Forest Service has contracted for an impact analysis but project priorities change, in a bureaucratic setting it is fairly simple to postpone or cancel the analysis. In situations of high uncertainty this is an important option.<sup>153</sup> Under private contracting, it might require renegotiation of the contract and penalty payments.

In choosing between internal production and external contracting, it is important to consider both the expected benefits and costs of the two forms of production, and the probability that intervention, i.e., a need for adaptation of the contract to unforeseen contingencies, will occur. Two important elements of this calculation are the complexity of the task under consideration and the need for rapid adaptation to unforeseen contingencies. When the task is particularly novel and complex, unforeseen contingencies are more likely to arise. And if rapid adaptation to these events is crucial (as in the case of national defense, for example), ease of intervention to redirect activities and limit the duration of renegotiation may be relatively important; under such circumstances, government provision is more likely to be the preferred method.

To help bring together these various concepts consider the “make or buy” decision as illustrated in Figure 5. The vertical axis represents the cost advantage of market procurement relative to internal production. The horizontal axis represents the degree of asset specificity required for a particular transaction.

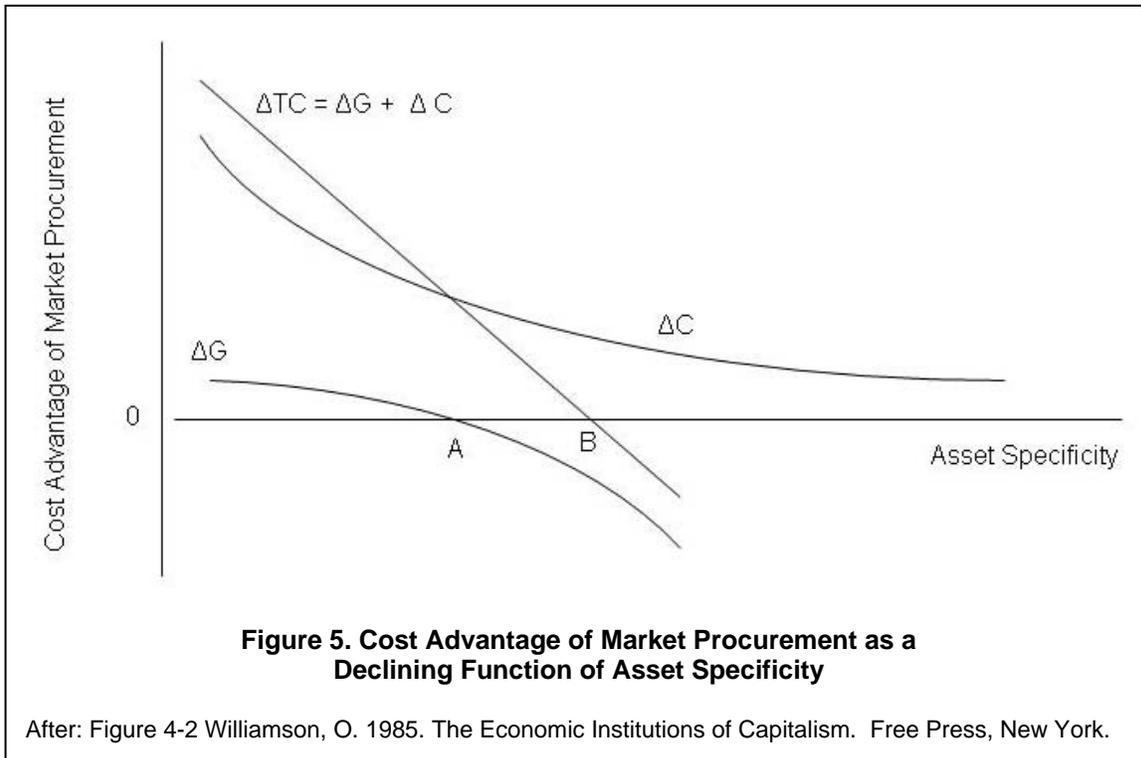
The total cost advantage of acquiring the good or service through external means,  $\Delta TC$ , is the sum of the difference in actual production costs,  $\Delta C$ , and the difference in governance or transaction costs,  $\Delta G$ . The production cost advantages of external production are substantial for the most common items, e.g., pencils. Their production requires virtually no low specialized assets. But as the good or service becomes more and more specialized to the buyer  $\Delta C$  declines as illustrated in Figure 5.

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<sup>151</sup> See Sappington & Stiglitz, at 568, 580-81

<sup>152</sup> See *id.* at 568.

<sup>153</sup> Cf. O'Leary et al. 1999. Managing for the environment: Understanding the legal, organizational, and policy challenges. 288-89 (suggesting that government may adopt a contract or privatization approach to *enhance* flexibility because “[i]n some circumstances, starting up new programs is easier for a contractor or grantee than for a government bureaucracy encumbered by mandated standard operating procedures, demanding interest groups, and bureaucratic red tape.”) The Superfund program, for example, was established with heavy reliance on contractors, because Congress and EPA assumed contracting would enable EPA to get the program started faster than if the agency had to first develop internal structure and expertise. See Office of Tech. Assessment, U.S. Congress. 1989. Assessing contractor use in Superfund. at 1-4.



Similarly, the costs of managing the transaction may actually be lower for external acquisition in the case of the simplest items, illustrated by the fact that  $\Delta G$  is positive for transactions for the least specialized goods or services. However, as asset specificity increases, the need for special contractual mechanisms, credible commitments, and other arrangements to protect the producer's investment also increase. Very quickly, the costs of governing the external production relation are greater than for managing the internal production process as asset specificity passes point A.

For even more specialized acquisitions, the costs of governing the external relation continue to grow; illustrated by the fact that  $\Delta G$  is negative. With ever more specialized transactions the cost advantages of external production also decline; illustrated by declining  $\Delta G$  and  $\Delta C$ , respectively. Eventually, as asset specificity exceeds B, the higher costs of governing the external relation exceed the costs savings of external production, indicated by the fact that  $\Delta TC$  is negative. The rational choice is to opt for internal production under these circumstances.

To summarize, the primary reason to procure goods or services through the market is because it is less costly. However, assuming the presence of opportunistic behavior, bounded rationality and uncertainty, the cost advantages of the market are a declining function of the degree of asset specificity involved in the production of the good or service. For highly specialized contracts it may be more efficient to “make” than “buy”.

### c. Governance mechanisms

The transaction cost economics literature recognizes the existence of a range of instruments between classical contracts and pure hierarchical production. In the interior of that range the parties to the contract share control over production decisions. Several structures can be built into a contract to create hierarchical elements while avoiding the need for the buyer to undertake the production activity directly. The elements include:

- (a) command structures and authority systems, (b) incentive systems, supporting authority systems and also guiding the use of a contractor's discretion by a structure of differential rewards partially isolated from the market, (c) standard operating procedures, which describe routines that involve actions by both contractors and clients, (d) dispute resolution procedures, partially isolated from the court system and the market, and (e) pricing of variations in performance partially isolated from the market, including especially pricing based on contractor costs.<sup>154</sup>

Authority systems primarily establish the means for legitimating directions for changes and for clarifying the distribution of costs and risks associated with the changes.<sup>155</sup> In the extreme, however, authority systems become approval systems, slipping into supervisory/monitoring functions. When government supervision of contract execution becomes too cumbersome, there is the serious possibility of losing the "high-powered" incentives that constitute the primary advantage of contract or subsidy arrangements with private parties.<sup>156</sup> "Aside from the extra work involved in creating a document for approval for each intermediate decision, such a fine net of approvals strains out any discretion or originality that the contractors' engineers might have been afflicted with."<sup>157</sup>

Although the authority system recognizes that contractual changes may be required, the incentive systems and standard operating procedures built into contracts serve to clarify how performance will be evaluated and the specific expectations of the parties. The dispute resolution procedure, often involving an arbitrator, allows performance to continue even as disagreements are settled. Thus, performance can be more rapidly redirected. Finally, the pricing of variations (change orders in the language of construction contracting) clarifies for the client the cost of changing specifications, allowing efficient adaptation and reducing the potential for conflict.

These mechanisms allow contractual adaptation to uncertainty. They develop governance mechanisms that lie somewhere between classical contracts and pure hierarchy. For example, Stinchcombe estimates that in large construction projects, typically 20 percent of the work is

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<sup>154</sup> Stinchcombe, A. 1985. Contracts as Hierarchical Documents. *In* Stinchcombe and Heimer, eds., *Organization Theory and Project Management: Administering uncertainty in Norwegian offshore oil* at 156.

<sup>155</sup> See *id.* at 156-157.

<sup>156</sup> Williamson at 140.

<sup>157</sup> Stinchcombe at 157-158.

done under hierarchical change orders.<sup>158</sup> Eighty percent of the work done in research & development contracts for weapons is done in a hierarchical (internal) mode.<sup>159</sup>

These specialized governance mechanisms, hovering between pure contract and pure hierarchy, are costly, however. They may be less attractive than either incentive-based contracts, which are unable to induce investment in highly specialized assets, or hierarchical production, which sacrifices desirable incentive characteristics. The art of choosing and designing a governance mechanism for transactions is to recognize when the production cost benefits associated with incentive-based governance are so seriously eroded that the considerable costs of developing nonstandard mechanisms are no longer justified. The goal is to find the arrangement that minimizes the sum of production and transaction costs.<sup>160</sup> These intermediate mechanisms can be designed to overcome potential difficulties related to measurement, asset specificity, and uncertainty/adaptability, but their benefits must be weighed against their considerable costs.<sup>161</sup>

#### **d. Relational Contracting as a Type of Hostage**

Reference was made in the discussion above to the possibility that parties to the contract might find a way to make credible commitments to not engage in opportunistic behavior following contract formation. More specifically, they make commitments that they will not leave their contracting partner with stranded highly specialized assets that have little or no value outside the contract. Of course, parties can provide verbal assurances during the contract negotiations. But if the words are not backed up by an action that actually exposes the parties to economic loss if they behave in a manner counter to their claim, the commitments are not credible.

Williamson has suggested that one mechanism for accomplishing credible commitments is an exchange of hostages. This could be accomplished, for example, by the buyer paying for all or part of the production assets. But such arrangement can be difficult to formulate, and challenging to sustain. To cite one obvious problem, if the buyer has purchased the production capital, what incentive does the producer have to invest in maintenance of the capital?

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<sup>158</sup> See *id.* at 167

<sup>159</sup> See *id.*

<sup>160</sup> The Forest Service may, of course, seek external production for reasons other than simple cost minimization. For example external contractors may be able to deliver products in a timelier manner or of a higher quality. But this simply begs the question. Given that a particular quality or timing of work is required, it may cost less to have the work produced under contract than under hierarchical arrangement.

<sup>161</sup> A related issue arises when the government is implementing a complex program such as Superfund. The government has attempted to contract out the actual testing and physical cleanup work while retaining many of the decisions that require government authority or value judgments. See Office of Tech. Assessment, U.S. Congress. 1989. Assessing contractor use in Superfund, at 4-5. However, these two roles cannot be clearly delineated in a highly technical, complex, and socially volatile program. The matter is made more complex by the high attrition rate among government employees that manage the contractors. The salary differential between government managers and private contractors induces civil servants with even modest experience to migrate to the private sector. See *id.* at 6. Thus, there is a "lack of development of internal EPA expertise, which results in poor contract management and oversight." *Id.*

There is, however, a subtler form of hostage exchange, one that prevents either party from behaving opportunistically. When a contracting relation has passed its first stages, and the mutually advantageous nature of the arrangement has become apparent, the relationship itself often serves as an adequate hostage. Neither party is willing to give up the value of the relation to gain some short term advantage through opportunistic actions. This is an arrangement known as relational contracting.

For relational contracting to be effective, however, two conditions must be attained. First, the economic value of the expected future gains for each party must exceed the potential short-term economic gains of opportunistic default for either. Second, the contracting arrangement must have an indefinite ending point. One of the implications of relational contracting is that frequently repeated transactions tend to be more stable because in their sum they are likely to be more beneficial to the contracting parties.

In general, relational contracting is marked by diffuse obligations and sanctions, reliance on mutual planning, bargaining, and collaboration. As implied by the name, mutual trust and shared norms are important features. Generally, relational contracting relies on alternative means of resolving disputes, frequent communication between the parties, and joint problem solving between the parties.<sup>162</sup>

#### **e. Implications of New Institutional Economics**

The extent and nature of contracting opportunities in the NEPA process depend very much on the characteristics of the specific tasks. First, the Forest Service will need to be clear regarding its capacity to measure and monitor performance of contracted tasks. This requires a clear sense of both the goals of NEPA and indications of successful completion of the NEPA activities. Second, the activities that are most easily contracted are those that do not involve a great deal of uncertainty or specialized investments. Because many of the NEPA activities are intertwined with one another and often involve dealing with the public and making adjustments to new developments, i.e., are performed in an uncertain environment, they may be more challenging to execute through contract. That is not to say that they can not be performed externally, only that doing so will require contracting mechanisms that will allow adjustments in the goal and conduct of the activities.

### **7. Applications to the Forest Service's NEPA Activities**

There are two primary lessons that arise from the literatures on strategic organizational design and New Institutional Economics. From the former literature we learn the importance of collocating authority to make decisions with the knowledge that is required for those decisions to be effective. Moreover, there are costs of moving the authority to the locus of information or the information to the locus of authority. From the latter literature, NIE, we understand that the optimal organization of production activities—internally through hierarchical arrangements or externally through the market—depends very much on the

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<sup>162</sup> Fernandez, S. 2005. Accounting for Performance in Contracting for Services: Are Successful Contractual Relationships Controlled or Managed? Draft paper, School of Public and Environmental Affairs, Indiana University.

nature of the task to be supported. Where the transaction requires highly specialized assets, where there is significant uncertainty about the goals or trajectory of the transaction, and where there are difficulties with measuring the performance of the transaction, a hierarchical arrangement may be justified even at the cost of losing the high-powered incentives of the market place.

Given this background we can now turn to the nature of the Forest Service NEPA activity itself. It is necessary to address a number of issues regarding the nature of the compliance process, including:

- Is NEPA compliance a strategic or a tactical activity?
- Is coordination among units performing NEPA activities required?
- Are there potential economies of scale or scope in the execution of NEPA compliance?
- Does NEPA require significant investment in specialized assets?
- Does NEPA compliance entail significant uncertainty?
- Is there often a need for adaptation of the NEPA process once work on a particular process begins?
- To what extent can or should the Forest Service's NEPA activities be formalized?
- What constitutes success in the NEPA process?
- What accountability mechanisms can be developed for the NEPA process, either for internal or external arrangements?
- Who owns NEPA?<sup>163</sup>

To address these questions it is important to first examine the nature of the NEPA compliance process itself.

**a. Steps in the NEPA process.**

In 2002 a group of Forest Service personnel, in cooperation with CEQ staff and outside consultants, conducted an exercise to identify the individual steps involved in NEPA compliance during a typical Forest Service project; specifically, a proposed timber sale.<sup>164</sup> Every legal requirement, including those from the initial act, the CEQ codification, and the Forest Service Handbook, was identified and organized into a “Business Activity Model” that provided a map of the conduct of NEPA compliance. For the uninitiated, perhaps the most startling result of the exercise was the sheer volume of distinct tasks. The analysis identified 1166 separately named tasks. However, many of these were simply headings for layers of multiple subcategories of tasks. After eliminating all headings and subheadings, there are about 800 distinct steps in the NEPA compliance process. Clearly, then, it would be a misconception to think of NEPA compliance for a particular proposed project as a single

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<sup>163</sup> NEPA is a very iterative and interdisciplinary process within the Forest Service; however, when one of the authors (JB) posed this final question individually to approximately 50 USFS employees, only one—a district ranger—replied, “I do.” Most replied that someone else, generally at a higher level of the agency, someone outside the agency, or the judicial branch, owned the process.

<sup>164</sup> Boling, E.; J. Carbone; B. Lee; A. Morrison; R. Smith. 2002. Workshop Summary: Business Activity Modeling of the CEQ's NEPA Regulations (40 CFR 1500 1500-1508).

[http://www.fs.fed.us/institute/bus\\_mod/ceq/CEQ\\_Workshop\\_Final\\_Report.pdf](http://www.fs.fed.us/institute/bus_mod/ceq/CEQ_Workshop_Final_Report.pdf)

activity. In fact, NEPA compliance in project planning is actually an amalgam of very diverse activities. Thus, to suggest that NEPA compliance either “is” or “is not” suitable for outsourcing is an oversimplification that does not reflect the multifaceted nature of the process.

For present purposes, the model’s detailed enumeration of activities also provides insight into the specific characteristics of representative activities. The model is organized around a hierarchical arrangement of grouped activities. Most categories are labeled according to the legal source from which the responsibility originates. Most activities are also classified according to whether they are required (R), situational (S) or optional (O).

**Required** activities are specifically mandated by the NEPA statute or regulation, e.g., an agency shall do a certain activity. **Situational** activities are actions that must be done but only if certain conditions exist. **Optional** activities are those an agency should consider while performing NEPA analysis but not required to do.<sup>165</sup>

Under the general heading of “Comply with NEPA process,” at its highest aggregation, the model identifies ten categories of activities (Table 2). Notice that these activities are quite general or open-ended in nature: “comply with,” “characterize,” “determine,” “conduct scoping,” “make decision,” and so on. Also, recognize that each one of the items in Table 2 is further subdivided into tasks and subcategories of tasks. For example, the first item listed in Table 2, “Comply with Operating Principles”, contains 11 distinct subtasks at the next level (Table 3). Five

**Table 2: Primary Categorization of NEPA Activities**

Activity	Activity ID Number
Comply with Operating Principles	1.3.1.3.2.1.1
(R) Characterize the Proposed Action and Nature of the Decision to be made - 40 CFR 1502.4(a), FSH 1909.15,11.2	1.3.1.3.2.1.2
(R) Determine if NEPA applicable to Proposed Action (Make determination of major Federal action significantly affecting the quality of the human environment) 40 CFR 1508.18 102(2)(C)	1.3.1.3.2.1.3
(R) Conduct Scoping and Involve Public (for EIS only) - 40 CFR 1501.7, 1506.6(a), Conduct scoping on all Proposed Actions FSH 1909.15,11	1.3.1.3.2.1.4
(R) Determine appropriate Environmental Documentation 40 CFR 1501.3(a), 1501.4(a)	1.3.1.3.2.1.5
(R) Collect and Interpret Data - (40 CFR 1502.22, FSH 1909.15,13)	1.3.1.3.2.1.6
(R) Conduct Environmental Analysis and Prepare Appropriate Environmental Documentation - 40 CFR 1501.3(a), 1501.4, 1501.6(b)(3). 1502.2, FSH 1909.15,10.2(2)	1.3.1.3.2.1.7
(R) Make decision on proposed actions - 40 CFR 1502.1	1.3.1.3.2.1.8
Correct, Supplement or Revise an Environmental Document (Post Decision) - FSH 1909.15,18	1.3.1.3.2.1.9
(O) Provide Response on Referral to the Council 40 CFR 1504.3(d)	1.3.1.3.2.1.10

Derived from spreadsheet provided by Bob Lee and Sarah Hall, USDA Forest Service. Information also available at [http://www.fs.fed.us/institute/bus\\_mod/ceq/](http://www.fs.fed.us/institute/bus_mod/ceq/) under item A2.1 *et seq.*

<sup>165</sup> *Id.* at 3. Interestingly, it may be the “optional” activities that hold the key to NEPA success. For example, project managers are not required to conduct town meetings by regulation, but doing so may decrease delays in the long run or even avoid cancellation of the project later.

of the 11 subtasks in Table 3 lead to further delineated subtasks. With each additional layer the nature of the tasks becomes more concrete.

**Table 3: Secondary Level of “Comply with Operating Principles”**

Activity	Activity ID Number
(R) Inform decision Makers and the Public of Reasonable Alternatives to avoid / minimize adverse impacts or enhance quality of the human environment 1502.1	1.3.1.3.2.1.1.1
(R) Focus on Significant Environmental issues and Alternatives 1502.1	1.3.1.3.2.1.1.2
(R) Format environmental impact statements to reflect good analysis and clear presentation of the alternatives including the proposed action 1502.10	1.3.1.3.2.1.1.3
(R) Ensure Range of Alternatives Considered encompass those considered by ultimate decision maker 1502.2(e)	1.3.1.3.2.1.1.4
(R) Employ Interdisciplinary Approach during EIS development 1502.6	1.3.1.3.2.1.1.5
(R) Eliminate Duplication with State and Local Procedures / Comparable State and Local Requirements 1506.2	1.3.1.3.2.1.1.6
(R) Reduce Paperwork 1502.1	1.3.1.3.2.1.1.7
(R) Ensure Availability of Draft EIS on Presentation of Proposed Rule (Informal Rule Making) 1502.5(d)	1.3.1.3.2.1.1.8
(R) Maximize use of environmental analysis & proposals of cooperating agencies 1501.6(a)(2)	1.3.1.3.2.1.1.9
(S) Delay implementation of action concerning the proposal (prior to ROD) 1506.1(a)	1.3.1.3.2.1.1.10
(R) Maintain List of National Organizations Requesting Regular Notification 1506.6(b)(2)	1.3.1.3.2.1.1.11

Derived from spreadsheet provided by Bob Lee and Sarah Hall, USDA Forest Service. Information also available at [http://www.fs.fed.us/institute/bus\\_mod/ceq/](http://www.fs.fed.us/institute/bus_mod/ceq/) under item A2.1 *et seq.*

Consider a list drawn from the approximately 800 tasks in the Business Activity Model (Table 4). Each section of the table contains tasks that involve varying degrees of discretion. At the top (magenta region) are the tasks that would be very difficult to assign to a contractor, such as “Determine Whether or Not to Prepare an EIS” and “Determine the Appropriate Environmental Documentation.” Others may simply be proscribed from contracting, having been entrusted to the judgment of a Forest Service official by law. At the other extreme are the tasks, such as “Provide Public Notice of NEPA related hearings and public meetings” and “Prepare summary of all substantive comments,” that almost certainly could be handled by a competent contractors via a standard service contract.

While an implicit “gut-level” instinct may be sufficient to decide the “make or buy” decision for some of these activities, it is more difficult to judge for others. Between the activities at the two extremes are others in the gray and tan areas that might or might not be amenable to contracting out. For these it would be appropriate to inquire about the degree of uncertainty involved in their execution and whether their conduct requires high levels of specialized investments on the part of the contractor.

**Table 4: Examples of Tasks from Business Activity Model Illustrating Varying Contractibility of NEPA Activities**

(R) Ensure the Proposal is properly defined - 40 CFR 1502.4(a)	1.3.1.3.2.1.2.1
(R) Determine Lead / Cooperating Agency -- 40 CFR 1501.5(a), 1501.7(a)(4), 1501.6, 1501.6(a)(1)	1.3.1.3.2.1.4.1.1
Determine if a Decision on a Proposed Action is no longer necessary - FSH 1909.15,21.3(p1)	1.3.1.3.2.1.4.5.3.4.1
Determine Whether or Not to Prepare an EIS	1.3.1.3.2.1.5.2.1.4
Consider agency objectives – FSH 1909.15,13.03	1.3.1.3.2.1.6.1.4
Determine the Importance of New Information FSH 1909.15. 18.	1.3.1.3.2.1.9.3.3
(R) Ensure Professional / Scientific Integrity of discussions and analyses in the EIS 40 CFR 1502.24	1.3.1.3.2.1.7.6.7.2.7.3.1.1.2
Make Decision based on Environmental Assessment - FSH 1909.15,43	1.3.1.3.2.1.8.2
Determine the Appropriate Environmental Documentation 40 CFR 1501.3(a),1501.4(a)	1.3.1.3.2.1.5
Determine Significance of Environmental Effects (Without Mitigation Measures) 40 CFR 1508.27	1.3.1.3.2.1.5.2.1.1
Determine Scope of Environmental Analysis 40 CFR 1508.25, 1501.7(a)(2)	1.3.1.3.2.1.4.6
(R) Invite Participation of Affected Federal, State & Local Agencies, Affected Indian Tribes, Proponents of the Action, other Interested Persons 40 CFR 1501.7(a)(1)	1.3.1.3.2.1.4.5.4.1
Contact affected members of the public	1.3.1.3.2.1.4.4.1
(S) Modify alternative(s) / proposed action and respond to comments accordingly - 40 CFR 1503.4(a)(1)	1.3.1.3.2.1.7.11.3.7
(S) Analyze the significance of an action in the context of society as a whole (human, national) 40 CFR 1508.27(a)	1.3.1.3.2.1.3.3.1.5
(R) Determine which proposals will be subject of a particular EIS 40 CFR 1502.4(a)	1.3.1.3.2.1.5.3.2
(S) Consider Adoption of Existing EIS 40 CFR 1506.3	1.3.1.3.2.1.5.4
(R) Notify interested and affected persons of the decision to proceed with the proposed action - FSH 1909.15,32.1,11.7	1.3.1.3.2.1.7.1.1.1
Develop and Consider Other Alternatives Fully and Impartially - FSH 1909.15,14.2, 1909.15,14.2(p2)	1.3.1.3.2.1.7.5.1.2
(R) Respond to Comments - 40 CFR 1503.4, 1502.9(a), 1502.9(b)	1.3.1.3.2.1.7.11.3
Use the ID Team to Formulate Analysis and Evaluation Criteria and Standards- FSH 1909.15,12.3(a)	1.3.1.3.2.1.4.3.2
Develop Scoping Statement	1.3.1.3.2.1.4.5.1
Determine if there are no extraordinary circumstances related to the proposed action - FSH 1909.15, 30.3(1)(b)	1.3.1.3.2.1.5.1.1
Develop and Consider No-Action Alternative - FSH 1909.1514.1	1.3.1.3.2.1.7.5.1.1
(R) Identify all alternatives considered in reaching a decision 40 CFR 1505.2(b)	1.3.1.3.2.1.8.1.3.2
(R) Document reasons why an EIS will not be prepared 40 CFR 1508.13	1.3.1.3.2.1.8.2.6.1
(R) Determine if Proposed Action is one without precedent 40 CFR 1501.4(e)(2)(ii)	1.3.1.3.2.1.8.2.9.1.2
(R) Provide Precise description of Nature & Extent of the Proposed Action 1501.5(e)(1)	1.3.1.3.2.1.4.1.3.1.6.1.2
(R) Describe the proposed action and possible alternatives 40 CFR 1508.22(a)	1.3.1.3.2.1.4.5.1.1
Describe nature and scope of proposed action and the decision to be made - FSH 1909.15,21.1	1.3.1.3.2.1.4.5.1.5
(R) Provide Public Notice of NEPA related hearings and public meetings 40 CFR 1501.7(a)(1), 1506.6(b)	1.3.1.3.2.1.4.5.4.1.2
(S) Determine cost of obtaining information - 40 CFR 1502.22	1.3.1.3.2.1.6.1.3
Collect Data on Physical Conditions - FSH 1909.15,13.03(p1)	1.3.1.3.2.1.6.2.1
Perform Field Reconnaissance to Collect Additional Data	1.3.1.3.2.1.6.2.1.3
(R) Mail DM to those who requested it - FSH 1909.15,33(1)	1.3.1.3.2.1.7.1.2.2.1.2
(O) Prepare summary of all substantive comments - FSH 1909.15,24.1(2)	1.3.1.3.2.1.7.11.2
Estimate Effects on Visual Conditions	1.3.1.3.2.1.7.5.2.1.11
Update 3 Year Cost Estimate to Address Other Alternatives	1.3.1.3.2.1.7.5.2.6.1.1.1
Determine Future Costs and Benefits*	1.3.1.3.2.1.7.5.2.6.1.3
Describe Existing Soil Conditions	1.3.1.3.2.1.7.6.3.1.10

Derived from spreadsheet provided by Bob Lee and Sarah Hall, USDA Forest Service. Information also available at [http://www.fs.fed.us/institute/bus\\_mod/ceq/](http://www.fs.fed.us/institute/bus_mod/ceq/) under item A2.1 *et seq.*

**b. Internal Organization of the Forest Service NEPA Activities**

Clearly, certain NEPA tasks delineated in the “Business Activity Model” need to be conducted at the Forest District or Forest Level. They are highly specific to the local physical, social, economic and cultural environment of the underlying projects, thus the “costs” associated with trying to transfer the knowledge to a much higher level likely outweighs the benefits gained from a corporate perspective on these activities.

If these NEPA activities and the decisions about them are so local in nature, does the issue of internal structure have any salience? It does, and at the very highest level. The Forest Service leadership first needs to make a decision regarding NEPA strategy. What is the paramount goal for the Forest Service’s NEPA compliance?

As discussed above, there are at least three conceptions of NEPA currently competing within the Forest Service: (1) NEPA as an aid to decision-making, (2) NEPA as a mechanism for public involvement, and (3) NEPA as a legal obstacle to good forest management. Although the first two may be mutually compatible, the third suggests a very different view of compliance.

If the Chief decides that she wants the field personnel to use the NEPA requirements to promote good decision making and to involve the public, that is a strategic decision that has implications for the entire organization. At least in part, the Forest Service’s reputation is national in scope. Many of the important players in the Forest Service’s political environment do not differentiate between practices and attitudes in the Northwest Region and the Southeast Region. Therefore, the conduct of business in Portland has spillover effects on Atlanta. For this reason, the Chief’s primary concern would be with achieving consistency of NEPA goals across regions.

But how does the leadership of the Forest Service guide the behavior of decentralized personnel toward consistent goals and behavior, leading to a unified reputation and status for the field personnel? Are formalized, rule-based control systems (characterized by the Machine Bureaucracy) unlikely to yield satisfactory results? The forestry profession generally and the Forest Service in particular are going to have to adapt professional training to embrace the new, broader scope of the forestry professional’s responsibilities, which now include not only scientific technical competence, but also the ability to work with and represent the public. This means that elements of the profession, such as training and the code of conduct, will have to be updated to reflect the reality of the new environment.

The Forest Service leadership might, alternatively, determine as a strategic matter that the primary goal of the NEPA activities is to “bullet-proof” the EIS process. Under this approach, it is important that the NEPA documents adhere to the letter of the law even at the cost of decreasing the value for decision making and public involvement. A more standardized approach to compliance will be required. Here there is a competition between two types of knowledge, legal and contextual (field); and the emphasis is on legal. Hence, under this approach it may be less costly to move the contextual information to a unit with legal knowledge than to move the legal knowledge to those with contextual information. This suggests the possibility of a centralized NEPA compliance center based on a highly

formalized process, or a place where all NEPA projects are routed for a compliance review before they are finalized.

**c. Market Provision of the Forest Service’s NEPA Activities.**

As the Forest Service considers the use of contract (as opposed to employment) relations to conduct NEPA tasks, it will be necessary to consider several factors. First, which, if any of the activities are legally proscribed from external contracting? Many of tasks appear to be specifically assigned to Forest Service employees by law, particularly those requiring public trust in decision-making. The Forest Service should obtain legal counsel for clarification of these issues.

Second, are there potential contractors who are qualified or could become so? Sometimes, because of the highly specialized nature of the work, particularly where technical expertise or data are already located inside the organization, external production simply will not save time or costs. A Region 1 contracting officer observed that “whenever the contractor needed information, our people had to spend a good deal of time gathering the necessary info to send along...there is little savings in terms of time and effort.”

Third, given the range of NEPA tasks, which ones are sufficiently modular to permit contracting? As illustrated by Table 4, there is a wide range of NEPA activities. Some are relatively self-contained and isolated from other steps in the process. These will likely be the easiest to conduct under contract. One Region 1 employee observed about recent contracting experiences, “What we contracted was for a piece of the analysis, not the whole thing... [It] seems to have been very successful.”<sup>166</sup> But some of the steps are integrally linked or dependant upon other tasks in the process. These will require constant updating as data become available and events in the process unfold.

More importantly, there are many sources of exogenous uncertainty (Table 5). These include changes in the natural environment from perturbations such as fire, disease, or pest infestations that can change the direction or need for a project. Uncertainty also arises from political and bureaucratic changes, such as the election of a new president, a change in control of Congress, budget rescissions, or adoption of new priorities.

Complexity of task and significant uncertainty do not necessarily exclude these tasks from the contracting process, but rather suggest that the contractual arrangements under which they will be performed will be more complex. How will the contractual relations adapt to changes in the policy and project environment? Ultimately, more complex contracts increase the cost of external performance. The Forest Service will need to explore the types of contractual arrangements that will allow work to adapt to developments in an uncertain environment. Just as important, it will have to assure that its employees are prepared to manage those contracts.

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<sup>166</sup> “Past NEPA Contracting Experiences – Region 1”, anonymous internal document, posted to Region 1 intranet. Copy on file with authors.

Finally, does conduct of the NEPA tasks require substantial investment in highly specialized activities? Table 5 provides some examples of the investments that contractors might need to make to support a contract to conduct Forest Service NEPA activities. The extent to which these investments are specialized depends upon how idiosyncratic the Forest Service

<b>Table 5: Transaction Cost Factors in NEPA – Some Examples</b>	
<b>Uncertainty</b>	<p>Fire, pests, invasive species discovery of burial sites.</p> <p>Budget rescissions, hiring freezes</p> <p>New species listed, e.g., lynx</p> <p>Political and leadership changes – changes in administration</p>
<b>Asset Specificity</b>	<p>Investment in training personnel to author EIS reports</p> <p>Investment in training personnel to collect and interpret data relevant to EIS, EA, etc</p> <p>Investment in employee participation in NEPA/NFMA Forest Plan Implementation Training Courses</p> <p>Investment in developing community connections and network to support NEPA process</p> <p>Investment in GIS equipment and computer models</p> <p>Investment in learning Forest Service specific formatting of EIS modeling and reports</p>

requirements are, i.e., how much they differ from other types of analysis or even other federal agencies' NEPA requirements. One way that a contractor can protect its investments is to diversify into other complementary activities such as conducting NEPA activities for other agencies. In any case, a quick look at the factors listed in Table 5 suggests that while the investments may be relatively specialized, they are not terribly large relative to the value of the contract. Fairly quickly, both the Forest Service and its

contractors will likely find that opportunistic behavior is not a problem in their contractual arrangement. The value of the relationship itself will outweigh any short term gains that might be realized by opportunism.

## 8. Conclusions

The NEPA process currently suffers from goal ambiguity. Within the Forest Service, and among the constellation of actors who partner with or who challenge the Forest Service, there are differing views on the primary purpose of NEPA. These differing views are frequently incompatible. The differing views of NEPA's purpose are: a) to improve the decision-making process and to use NEPA as a planning tool; b) to inform and engage the public; and c) to tackle and overcome a legal hurdle (that is, NEPA is perceived as neither a planning nor communicative tool).

To effectively conduct the NEPA work design, both through internal organization and external contracting, it is necessary to first clarify the Forest Service's goals for NEPA.<sup>167</sup>

<sup>167</sup> The Forest Service is proposing to move Agency NEPA procedures from its directive system to regulation. In terms of the hierarchy of law, regulation, and Agency direction, this move places the Forest Service's NEPA procedures at a higher level of authority (regulation) rather than the lesser level of manuals and handbooks. Most existing Forest Service NEPA procedures would be moved to regulation without substantial change;

Increased clarity in goals will allow not only more precise identification of the tasks but performance evaluation. Both are vital for effective organizational and contracting design.

Once goals are clearly defined, the Forest Service will have to address the degree of decentralization of decision-making. There is an inherent tension between moving decision-making out of the central office to take advantage of field personnel's specific knowledge of local circumstances, and the risk that decentralization of authority can lead to goal incongruity and the pursuit of individual objectives. To decrease the problem of goal incongruity the Forest Service may decide to increase the role of professionalism in the NEPA process or it may choose to accelerate the process of formalization. Alternatively, it may choose to constrain its NEPA personnel with a more formalized process. The important issue is for the Forest Service to make an informed, rational choice regarding the management of NEPA compliance rather than a system that has evolved in response to one disturbance after another.

If the Forest Service decides to strengthen professionalization among its personnel, it is going to have to develop a mechanism to update the training and socialization of developing professionals to reflect the new environment in which public foresters are working—an environment in which working with the public is as important as working with the land. It will also have to help its personnel to better understand the legal issues involved in NEPA activities as well as the challenges of managing complex contracts.

To decide which activities to subject to competitive sourcing, the Forest Service will need to examine the specific tasks in the NEPA compliance process. The myriad tasks of the Business Activity Model can be divided into groups determined by the amount of discretion inherent in each task. Activities involving high levels of discretion are poor candidates for contracting, and in some cases contracting is legally prohibited. Tasks involving less discretion are more susceptible to contracting.

Re-engineering or restructuring how the Forest Service approaches the NEPA process is a large investment. There will likely be a variety of transaction costs to lead any type of change or to respond to change that occurs from outside influences. Recognizing these costs along with the relationship between each type of activity and the government's interest is the key to understanding various investment strategies. Any organizational structure, including the existing structure, comes with relatively high costs, complexity, and uncertainties. The current workforce has a high median age with a large percentage nearing or eligible for retirement. The current workforce also was largely hired for their technical expertise in a natural resource field and may not be well-equipped to deal with business relationships found in contract environments or with the social issues that dominate the NEPA process. Thus the opportunity costs associated with hiring, training, and administering a future organization will be large.

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however, the proposal also attempts to better align the Agency's decision process with its environmental analysis process. The proposed regulations provide the option for a process that allows for better integration of collaboration and iterative decision making with the NEPA process and documentation and allows the responsible official to modify a proposed action or alternatives in an incremental and iterative way to facilitate collaborative decision processes.