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The U.S. Forest Service and Its Responsibilities under the National Environmental Policy Act: A Work Design Problem

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Abstract The U.S. Forest Service's responsibilities under the National Environmental Policy Act entail a wide range of activities including scoping, scientific analysis, social and economic analysis, managing public input and involvement, media relations, regulatory analysis, and litigation. These myriad duties raise several important organizational and management questions. First, is the U.S. Forest Service capable of discharging these widely varying tasks with high levels of effectiveness and efficiency? To what extent should these activities be outsourced to private contractors or other providers? For those responsibilities retained in-house, what organizational structure best supports their effective and efficient execution? To address these questions, this article draws on concepts from new institutional economics and insights from the privatization and strategic organizational design literatures.

Keywords U.S. Forest Service · National Environmental Policy Act · Make or buy · Competitive sourcing

Introduction

The National Environmental Policy Act of 1969 (NEPA) provides a brief but powerful statement of national policy "to encourage productive and enjoyable

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harmony between man and his environment" (NEPA, 42 U.S.C. section 4321). Best known as the origin of the environmental impact statement (EIS), NEPA also provided the Organic Act for the Council on Environmental Quality (CEQ) (NEPA 1969).

The USDA Forest Service expends a great deal of resources complying with the requirements of NEPA. Many of that agency's 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. A key concern is how the Forest Service should design its internal organization to best carry out the NEPA mandate. A related concern is whether NEPA compliance, in whole or part, might be better carried out through external contracting. Finally, for those NEPA activities that are executed by contract in the marketplace, the Forest Service must consider what sort of contracting arrangements might best serve its NEPA goals. The purpose of this article is to clarify these problems using concepts from the strategic organizational design and new institutional economics literatures.

We propose that the Forest Service confronts a combination of a strategic organizational design problem and a classic "make or buy" decision. The organizational design problem revolves around goal incongruence between Washington, D.C. headquarters and field operations—a problem that is made more complicated by the uneven distribution of information between these two parts of the agency. The make or buy model is pertinent because NEPA activities vary greatly in terms of their objectives and requirements for direct, authoritative control. Those activities with clear goals and subject to relatively little external uncertainty may be appropriate for competitive sourcing. NEPA compliance activities with murky or mutable goals and characterized by high external uncertainty are more appropriately handled internally.

The next section of the article provides general background on NEPA requirements and the administrative demands they place on the Forest Service. Following the introduction to NEPA, basic principles from organizational design and new institutional economics are considered and are related to competitive sourcing decisions. These principles are blended into a two-part work design and applied to the Forest Service's NEPA activities. The article concludes with inferences about the decisions facing the U.S Forest Service as the agency discharges its NEPA functions.

Background on NEPA

Fundamentally, NEPA requires that federal agencies consider environmental impacts as part of their decision-making process. Agencies that are considering an action that "significantly affect(s) the quality of the human environment" must develop "a detailed statement" that addresses the environmental impacts, unavoidable adverse environmental effects, and alternatives to the proposed action (NEPA, 42 U.S.C. section 4332(C)).

NEPA requirements are costly. A 1999 report by the National Academy of Public Administration found that approximately 40% 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 (NAPA 1999: 18).

By one reckoning, this category of work, dominated by NEPA compliance, costs the Forest Service at least $250 million per year, of which at least $100 million is avoidable (USDA Forest Service 2002a: 35). By another measure, "conducting environmental analyses and preparing environmental documents consumes about 18% of the funds available to manage the national forests and approximately 30% of the agency's field resources" (U.S. GAO (Government Accountability Office) 1997: 28).

The Forest Service is the single largest generator of environmental impact statements (EISs) of any U.S. federal government entity. In 2006, it prepared 144 final EISs—"more than 25% of the total prepared by all federal agencies" (CEQ 2007a). From 1970 to 2004, the agency filed 3,468 Draft Environmental Impact Statements (DEISs), which equates to approximately 15% of the total number of DEISs (22,757) filed by all federal agencies. Between 1998 and 2004, the Forest Service accounted for almost 26% (895) of all documents filed with the Environmental Protection Agency (Tzoumis 2007). Compliance with NEPA requirements, particularly tasks involving document preparation, not only encumbers Forest Service resources, but leads to delays and diminished predictability about project start dates (or whether projects will begin at all)—an especially important problem for time-sensitive projects such as silvicultural treatments prior to the fire season.

Before and after paperwork is filed, the Forest Service is routinely confronted by challengers, leading frequently to time-consuming and costly litigation (USDA Forest Service 2002a; Clarke and McCool 1996). From 1989 to 2002, the Forest Service defended 729 suits in federal courts, won 57.6% of the cases, lost 21.3%, and settled 17.6%. More than 68% of these lawsuits involved claims that the Forest Service had violated NEPA. Of the more than 30 statutes invoked by plaintiffs, NEPA, by far, was invoked most often (Keel et al. 2006, p. 200). It has been suggested that the Forest Service believes such litigation "constrains its professional expertise and frustrates effective management" (Keel et al. 2006: 196). According to the Council on Environmental Quality, NEPA's main purposes are "citizen involvement" and "better informed decisions" (CEQ 2007b.) Lawsuits are not the kind of citizen involvement the Forest Service strives to generate, and these suits suggest that some fraction of the public doubts that "better informed decisions" ensue from NEPA procedures, short of the suits, themselves.

Given the stakes involved, management of the Forest Service's NEPA responsibilities is a vital organizational concern. The agency faces challenges on two fronts: First, within the organization there is no clear agreement regarding the goals attending to NEPA compliance. Some within the organization approach NEPA as a hurdle: the goal is to comply with the law and to avoid litigation. Others view NEPA activities as an aid to improved decision-making—procedures that assure that environmental impacts are

considered in each major decision. A third view is that NEPA activities provide a venue for public participation in public land management processes (Richards et al. 2009). While most leaders and staff would acknowledge all three of these goals as implicit, there tend to be different emphases at different levels. Where organizational leaders generally emphasize the aspirational goals of improved decision making and more public involvement, those charged with operational responsibilities more often emphasize avoidance of law suits (Richards et al. 2009).

Second, the U.S. Office of Management and Budget (OMB) requires federal agencies to identify opportunities to more fully "rely on the private sector for needed commercial services" (OMB (Office of Management and Budget) 1983: 1). In response, the Forest Service is using tools such as competitive sourcing, performance-based budgeting, and tighter fiscal management to improve the cost-effectiveness and performance of its programs. In particular, OMB has directed the Forest Service to determine whether some or all NEPA activities should be carried out under competitive sourcing.

Thus, the Forest Service faces two pressures simultaneously. Even as it designs and implements its internal organizational strategy for the conduct of NEPA, it must determine whether its NEPA responsibilities could be partially or fully carried out under contract. To understand and address these two issues, it is useful to consider insights from both the strategic organizational design and new institutional economics literatures.

Basic principles for internal organization

Given the scope and scale of NEPA responsibilities in the Forest Service, the agency has struggled to determine how to discharge these duties and at what level in the organization. In the Forest Service hierarchy, the Washington D.C. headquarters is directed by the Chief. The Forest Service has 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 National Grasslands, which are further divided into Districts. In some cases, Districts are divided into Units. Nationally, there are 155 National Forests, 22 National Grasslands and approximately 600 Districts (USDA Forest Service 2005). In addition to the National Forest System, the Forest Service also includes Research and Development (five regional stations and one national laboratory) and State & Private Forestry branches. The analysis in the ensuing paragraphs considers organizational dynamics between the Office of the Chief and the National Forest System, in particular.

The fundamental task in designing internal activities of an organization is to match the locus of knowledge with the locus of decision-making authority (Jensen and Meckling 1995). Organizations can only function efficiently when those who have the knowledge necessary for decision-making also have the actual 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 (Windsperger 2002: 3–4).

At least two salient points can be drawn from Windsperger's insights. First, although his observations pertain to organization of firms, the principles laid out are no less relevant to 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 and devolved 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 "lower levels of the hierarchy" when firms produce knowledge that is costly to transfer to the central office. On the surface, this would appear to describe the context of the Forest Service—a highly decentralized agency with many dozens of field operations and unique field conditions. But in the arena of NEPA decision-making, Windsperger's precept does not necessarily hold true. Distinguishing between "knowledge" and "information" helps clarify this point. Where information refers to data and observations, knowledge is a broader concept that can also encompass technical expertise and understanding. In the case of NEPA, field personnel are repositories of 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.

If the problem were simply one of co-locating knowledge with decision rights, it might be possible to better educate field personnel regarding important legal and political considerations. But, for any number of reasons, the perspectives and actions of field personnel might deviate from the objectives of the larger organization. Based on local conditions, they might have a fundamentally different view of what is best for the organization as a whole, or their personal experiences or values might persuade them that in their context, customized (as opposed to uniform and generic) approaches to their own work are 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.[1]

[1] Historically, in the Forest Service, the location of knowledge and authority has been contested not only between the field and headquarters but also between the field and regional-level offices, and even between the field and sub-regional supervisors' offices. As career Forest Service official Archie Murchie explains:

> Starting way back in the late 1930s or early 1940s, there began a gradual change in the authority of rangers, and this change has continued clear up to the present. Things that a ranger wanted to do back then, he could go ahead and do without any approval from anybody. Then, as time went on, it got so that if you wanted to build a trail, for example, instead of just going out and building it, it had to be approved by the supervisor's office.…As time went on, it got so that a certain thing not only had to be approved by the supervisor's office, but it had to be approved by the regional office (Murchie and King 2002, p. 311).

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. Forest Service directives define what type of NEPA decisions can occur at what levels. In 2006, nearly all NEPA decision documents (99%) were signed at the Forest (22%) and District (77%) office levels (USDA Forest Service 2007a). Thus, currently, NEPA decisions are virtually all made in the field and not in headquarters. Tension over the most appropriate location for decision-making is compounded by OMB's initiative to provide many government services and activities through competitive sourcing. If the latter was adopted across the agency, most likely, headquarters would be even further removed from decision-making functions involving NEPA. But some agency actors in the field would lose discretion, too, as various tasks are contracted out. Schema for determining which functions are outsourced is the subject of the next section.

The "make or buy" decision

Whether key NEPA decisions are made by actors in central offices or in the field, there is pressure on the agency, generally, to rethink who is eligible to perform NEPA tasks. Since the Reagan administration, both the executive branch and Congress have urged that not all tasks currently performed by the government need remain that way. Over the years, the Forest Service has pondered whether, indeed, all NEPA functions need be performed internally. This concern has been raised several times over the past several years (NAPA 1999; U.S. GAO (Government Accountability Office) 1997; USDA Forest Service 2002a), but a new sense of urgency was created when the U.S. Office of Management and Budget (OMB) directed the Forest Service to subject its NEPA activities to review under the Federal Activities Inventory Reform Act of 1998 (FAIR Act) and OMB Circular A-76 "Performance of Commercial Activities."

It has been "longstanding Executive Branch policy" for the federal government to "achieve economy and enhance productivity and quality through competition to obtain the best service at least cost to the American taxpayer" (OMB 1999: 2). OMB compelled federal agencies to identify opportunities to more fully "rely on the private sector for needed commercial services" (OMB (Office of Management and Budget) 1983: 1). Prior to passage of the FAIR Act, that policy was reflected in OMB Circular A-76 with details provided by the Supplemental Handbook to OMB Circular A-76 (OMB 1996). In addition, OMB consulted with agencies to facilitate implementation of the policy (OMB 1999).

The FAIR Act served to codify much of the pre-existing policy into statutory law, particularly the requirement that agencies inventory their commercial activities. As part of the Clinton Administration's "government reinvention" effort, OMB further revised the Circular A-76 Supplemental Handbook (OMB 1999).Very broadly, the OMB Handbook directs 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.
- Develop government cost estimates for standard and streamlined competitions.
- Track execution of streamlined and standard competitions.
- Assist adversely affected federal employees (OMB (Office of Management and Budget) 1983: sec. 4).

"Competitive Sourcing" requires federal agencies to identify their "commercial type" jobs, and invite private actors to compete against the "most efficient organization," composed primarily of federal employees," for the right to perform such jobs (NAPA 2006: xi). 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.

In 2007, Forest Service personnel who work cumulatively at least 10 days per year on NEPA-related activities were asked to respond to a request for information by headquarters that occurred in February/March of that year (USDA Forest Service 2007b). The ensuing feasibility study included an assessment of the current volume of NEPA work, a map explaining the execution of this work in the organization, the potential impact on the agency's workforce, substantive contents of contracts, service/product standards and performance measures, a market analysis of relevant private service providers (of NEPA services), other agencies' approaches to NEPA, a cost-benefit analysis, and recommendations regarding the future execution of NEPA activities. The results of the feasibility study were released in August of 2007. The analysis presented by the authors of the present study was developed alongside the feasibility study and presented to the Forest Service as a White Paper in September 2007. Based on this and other guidance, the Forest Service determined that it would not undertake activities with private sector providers through competitive sourcing. Moreover, in 2008, appropriations committees in both the House and the Senate voted to temporarily suspend new, additional studies on competitive sourcing, thereby postponing agency-level decisions on competitive sourcing to after the 2008 presidential election. These decisions came as a relief to some in the Forest Service. Within both agency management and line staff ranks, there was contention over the prospect of outsourcing (PEER 2006). Concerns raised were comparable to those voiced by federal agencies during the Clinton administration's National Performance Review (NPR). Of that experience, Kettl observed that "[b]ecause the largest single piece of the promised savings was to come from reducing the number of federal employees, the threat to their jobs became the defining element of the NPR for most federal employees" (Kettl 1995, p.15).

Possible reductions in force and lower agency morale are non-trivial considerations for any agency confronted by demands for competitive sourcing. Another

downside from the perspectives of both agency management and rank-and-file, is the possible loss of agency authority and budgetary resources, particularly if private contractors report to offices or agencies that previously had no authority over the activities in question. All of these problems can be bases for agency resistance to competitive sourcing.

Nevertheless, Forest Service employees' doubts about competitive sourcing are not likely to permanently end the discussion. Pressure on the Forest Service and other agencies to meet the objectives of the FAIR Act and to attend to the requirements of OMB Circular A-76—or comparable "economy and productivity" demands by OMB—will likely continue in the years ahead. Recurring calls for internal reform at the Forest Service (Beaver et al. 2000; Nelson 2000) will re-energize demands for competitive sourcing, as will pressure on the agency to play its part in reducing the federal budget deficit.

Competitive sourcing and NEPA

Since pressure to competitively source NEPA activities will be part of the Forest Service's external political landscape for years to come, it behooves the agency to carefully consider what activities are relatively more or relatively less appropriate to contract-out. Yet, determining what is and is not a contractable activity is as much art as science. The OMB directive, for example, lacks clear instructions to help users distinguish between inherently governmental and privately-sourced functions. The A-76 directions include the following prescription to identify inherently governmental (non-contractable) 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 (OMB (Office of Management and Budget) 1983: attachment A, sec. B.1.a).

In distinguishing a commercial (contractable) 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 (OMB (Office of Management and Budget) 1983: attachment A, sec. B.2).

If this explanation is vague, perhaps the drafters of the guidance can be forgiven. Whether based on procedural guidance (such as OMB circulars) or by wisdom gained from practical experience, it is difficult to determine, on a case-by-case basis, which activities are best performed in-house and which can or should be contracted. Drafting a detailed *ex ante* definition that distinguishes inherently governmental activities from commercial activities would be more challenging still.

This prescriptive ambiguity affords the Forest Service considerable latitude in how it discharges its NEPA duties. The statement "commercial activity is not so intimately related to the public interest as to mandate performance by government personnel" leaves the agency with sufficient discretion to decide how best to execute NEPA requirements. In practice, the Forest Service has a great deal of discretion with respect to the "make or buy" decision (i.e., deciding which tasks to conduct in-house and which to take to the marketplace). On the one side, it does not appear that the OMB A-76 requirements, or its statutory basis, the FAIR Act of 1998, compels the Forest Service to competitively source NEPA document preparation processes. It could be reasonably argued that the NEPA process is "so intimately related to the public interest as to mandate performance by government personnel." After all, the NEPA process is intended to ensure that federal agencies, in particular, take environmental considerations into account in agency decision-making; sound resource management is at the core of the Forest Service mission.

At the same time, if the Forest Service decides that its mission, budget constraints, and goals are consistent with the use of contractors, it should have little trouble justifying the use of contractors, provided it observes the constraints stipulated in CEQ guidelines (Code of Federal Regulations 1983: title 40, 1506.5(c)) which require that federal agencies use contractors who can demonstrate they have no financial conflicts of interest and that the responsible officials in the agencies maintain sufficient involvement in and responsibility for the process and its outcomes.

Thus the question of outsourcing or competitively sourcing NEPA document preparation becomes a question of good management rather than legal constraint. 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?

New Institutional Economics (NIE, also referred to as transaction cost economics) provides some insight in this respect. First, NIE presumes that because of the advantages of powerful incentives inherent in the market, transactions (in the present case, the execution of the Forest Service's NEPA responsibilities) are better carried out through external contracts than through internal organizational processes—i.e., all other things being equal it is better to buy than make. However, in many cases transactions are carried out in a world of uncertainty and change. In these instances, it may be necessary to adjust the relationship underlying the transaction—sometimes quickly and decisively. Adjustments are simple and straightforward in a frictionless world where negotiations are instantaneous and both parties have the option to discontinue the arrangement. However, in the real world, negotiations take time and effort. Moreover, if successful discharge of the contracted responsibility depends primarily on assets—human, financial, or physical—one of the parties may be

vulnerable to opportunistic behavior by the other; the assets are at risk any time an adjustment is required.

Thus, NIE provides the following insight: when a transaction involves uncertainty and significant levels of specialized investments to support its execution, it may be best to carry out that transaction within the organization, and hence, forgo competitive sourcing.

The two-part decision for work design

The Forest Service's vulnerabilities in responding to competitive sourcing pressures constitute a "work design" problem. These pressures force the agency to develop a system of "arrangements and procedures for organizing" NEPA work (Sinha and Vande Ven 2005). That system, we argue in the two prior sections, requires the agency to reflect on its internal organizational puzzle—that is, to carefully consider where in the organization and to what degree it co-locates knowledge and decision-making authority. Then, the Forest Service must pay attention to the "make or buy" decision. These considerations can be further animated by depicting the Forest Service's work along two key dimensions: vertical levels and horizontal divisions (Fig. 1). Vertical levels refer to the extent to which an organization uses hierarchical arrangements to organize resources, information, and especially decision-making. 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 refer to the extent to which the work is distributed across many operational units within the organization or among other organizations. So an organization that contracts out much of its work 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. Organizing work along either dimension carries with it particular challenges. Arranging work within a hierarchy, relatively far up the vertical axis, raises the issue of how authority is distributed and decision-making is organized. Where work is placed on this axis affects how information is gathered and managed. For the Forest Service's NEPA activities, the challenge is how to encourage 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—requires identifying separable components of the work. The tasks assigned across Forest Service units and the agency's contractors must be designed as separable, relatively independent responsibilities; they also must match the type of work to the skills of the assignee. Generally, in contexts where responsibilities are competitively sourced to contractors and subcontractors, one is moving out further to the right on the x-axis.

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. The institutional arena of NEPA, like Fig. 1, involves 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

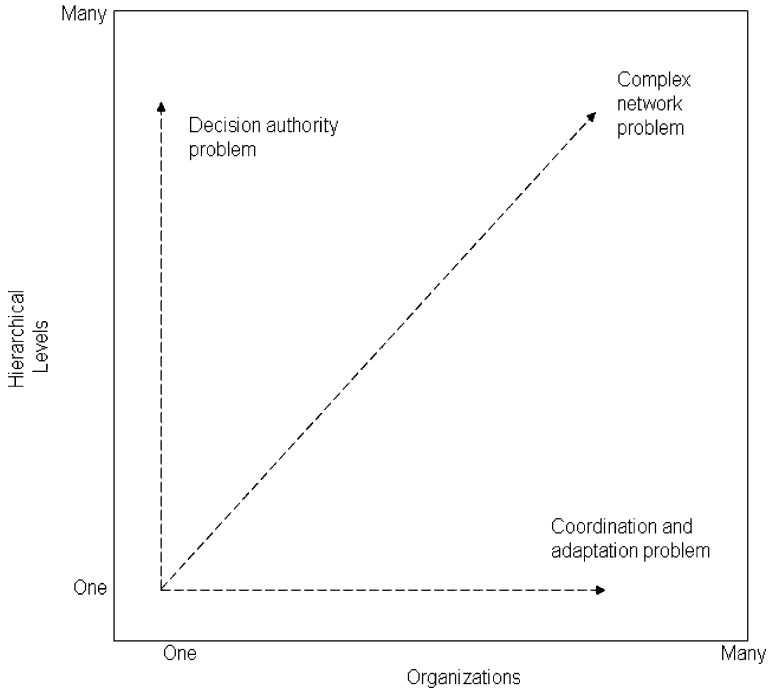

Fig. 1 Work design: vertical and horizontal organization. Source: Modified from Fig. 1, Sinha and Vande Ven 2005: 390

example, a wildlife biologist may be dependent upon the results of a forest vegetation report to draw effective conclusions. An additional layer of complexity comes in the form of the highly decentralized organizational structure of the Forest Service.

Applications to the Forest Service's NEPA activities

Optimal organization of work—internally through hierarchical arrangements or externally through the market—depends very much on the nature of the task to be performed. To animate the Forest Service's puzzle of balancing hierarchical control in NEPA processes and coordination of responsibilities, including responsibilities performed by private contractors, it is constructive to examine specific NEPA functions performed by the Forest Service.

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 (Boling et al. 2002). Every legal requirement, including those prescribed in the initial act, in CEQ's regulations, and in the Forest Service Handbook, was identified and organized into a "Business Activity Model" that provided a map of NEPA compliance practices and procedures. For the uninitiated, perhaps the most startling result of the exercise was the sheer volume of distinct

activities. The analysis identified 1,166 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 approximately 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 activity. 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 tasks. The model is organized around a hierarchical arrangement of grouped activities. 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 (Boling et al. 2002: 3).[2]

Under the general heading of "Comply with NEPA process," at its highest aggregation, the model identifies ten categories of activities (Table 1).

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 1 is further subdivided into tasks and subcategories of tasks. For example, the first item listed in Table 1, "Comply with Operating Principles," contains 11 distinct subtasks at the next level (Table 2).

Five of the 11 subtasks in Table 2 lead to further delineated subtasks. With each additional layer, the nature of the tasks becomes more concrete. As tasks become more concrete and less subject to discretion, they also become more amenable to contracting or outsourcing. Consider a list drawn from the approximately 800 tasks in the Business Activity Model (Table 3). Each section of the table contains tasks that involve varying degrees of discretion. At the top (white region) are the tasks that are impractical or illogical to assign to a contractor, such as "Determine Whether or Not to Prepare an EIS" and "Determine the Appropriate Environmental Documentation." Other tasks may simply be proscribed from contracting, having been entrusted to the judgment of a Forest Service official by law. At the other extreme are tasks, such as "Provide Public Notice of NEPA related hearings and public meetings" (darkest gray area) and "Prepare summary of all substantive comments," that almost certainly could be discharged by a competent contractor 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 lighter gray areas that might or might not be amenable to contracting out. For these it is appropriate to inquire about the degree of uncertainty involved in their implementation and whether

[2] Interestingly, it may be the "optional" activities that hold the key to NEPA success or failure for the Forest Service. 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.

Table 1 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 data provided by Bob Lee and Sarah Hall, USDA Forest Service. See also, USDA 2002b

Table 2 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 data provided by Bob Lee and Sarah Hall, USDA Forest Service. See also, USDA 2002b

their execution requires high levels of specialized investments on the part of the contractor.

Market provision of the Forest Service's NEPA activities

As the Forest Service considers outsourcing certain NEPA tasks, it will be necessary to consider several factors. First, which, if any of the activities are legally proscribed from external contracting? Many 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 to clarify these issues.

Second, are there potential contractors who are qualified or could become so? Because of the highly specialized nature of certain Forest Service functions, particularly where technical expertise or data are already located inside the organization, outsourcing may not lead to time- or cost-savings.

Third, given the range of NEPA tasks, which ones are sufficiently modular to permit contracting? As illustrated by Table 3, NEPA activities are wide-ranging. Some are relatively self-contained and isolated from other steps in the process. These are most readily contracted-out. In an interview with the authors, one Forest Service Region 1 employee observed, with reference to recent contracting experiences, "What we contracted was for a piece of the analysis, not the whole thing… [It] seems to have been very successful" (USDA Forest Service 2007c) But some of the pieces of the project are inevitably linked to or dependent upon other pieces. The multifaceted, interdependent nature of the process requires communication among NEPA participants and continual updating as data become available and events in the process unfold.

More importantly, there are many sources of exogenous uncertainty (Table 4). 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, appointment of a new chief of the Forest Service, a change in control of Congress, budget rescissions, or adoption of new agency priorities.

Complexity of tasks and uncertainty do not automatically exclude certain NEPA responsibilities from the contracting process, but may dictate that the actual contractual arrangements, themselves, will be relatively complex. How will the contractual relations adapt to changes in the policy and project environment? Ultimately, more complex contracts will increase the cost of the external actors' performance. The Forest Service will need to explore the types of contractual arrangements that can adapt to an uncertain environment. Just as importantly, the agency will need to assure that its employees are prepared to manage these contracts.

Finally, does the execution of NEPA tasks require substantial investments in highly specialized activities? Table 4 provides some examples of investments that may be necessary for Forest Service contractors to support NEPA activities. The extent to which these investments are specialized depends upon how idiosyncratic the Forest Service requirements are, i.e., how much they differ from other types of analyses or even other federal agencies' NEPA requirements. One way that a contractor can leverage its own investments is to diversify into other complementary

Table 3 Relative contractability of NEPA activities from low (white section) to high (dark gray section)

(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 data provided by Bob Lee and Sarah Hall, USDA Forest Service. See also, USDA 2002b

activities such as conducting NEPA-related work for other agencies. Entries in Table 4 suggest that while the investments may be relatively specialized, the size (cost) of the investments may not be large relative to the value of the contract. Both the Forest Service and its contractors will likely find that opportunistic behavior is not a significant hazard in the contractual arrangement. The value of a prospective long-term or recurrent contractual relationship will outweigh any short term gains that might be realized by opportunism.

Conclusions

At various times in recent years, the Forest Service has grappled with the degree to which it should decentralize decision-making and involve external actors in NEPA processes. 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 will lead to goal incongruity. To decrease the risk of mismatched goals, the Forest Service could increase the role of professionalism (e.g., new training regimes) in the NEPA process or it could constrain its NEPA personnel with a more formalized process. The Forest Service must make an informed, rational choice regarding the management of NEPA compliance rather than develop a system that has evolved in response to criticisms and crises.

To decide which activities to subject to competitive sourcing, the Forest Service must examine the specific tasks in the NEPA compliance process. In this article, we propose an overarching strategy for divvying up tasks based on whether they are relatively more or relatively less appropriate for competitive sourcing.

A key advantage of our formula is that it revolves around an organizing tool that the Forest Service already used to identify more than 800 distinctive NEPA tasks—

Table 4 Transaction cost factors in NEPA—some examples

Uncertainty
• Fire, pests, invasive species, discovery of burial sites
• Budget rescissions, hiring freezes
• New threatened or endangered species listings
• Political and leadership changes
Asset specificity
• Investment in training personnel to collect and interpret data relevant to Environmental Impact Statement (EIS), Environmental Assessment (EA), etc.
• Investment in training personnel to author EIS reports
• Investment in employee participation in NEPA/National Forest Management Act (NFMA) forest plan implementation training courses
• Investment in developing networks of community actors to support NEPA process
• Investment in GIS equipment and computer models
• Investment in Forest Service-specific formatting and publication of EIS models and reports

the Business Activity Model. Our approach calls for arranging the tasks listed in the Business Activity Model into groups, distinguished by the amount of discretion and uncertainty inherent in each activity. Tasks that are more appropriate for competitive sourcing (and through that process, conceivably, private contracting) tend to be routine, mechanical, and not, in the words of the Government Accountability Office "inherently governmental" or "core to the agency's mission" (U.S. GAO (Government Accountability Office) 2008). Some of these non-core tasks may involve professional or analytical skills that are unavailable among local Forest Service personnel. Consider, for example, the task of determining the costs of collecting data for a prospective environmental impact assessment, per 40 CFR 1502.22. This responsibility could demand a combination of field and policy analytical skills lacking in Forest Service offices in a particular district, national forest, or even Forest Service region. The task of determining data collection costs involves comparatively low levels of discretion versus the tasks we have listed in the white section of Table 3.

Tasks that are less appropriate for competitive sourcing will usually entail significant opportunity costs or may involve duties assigned by statute. Consider, for example, the responsibility of determining whether to undertake an environmental impact statement, as described under Forest Service Handbook 1909.15.20.1 (USDA Forest Service 2008). This is a weighty undertaking that, depending on its outcomes, determines whether dozens or hundreds of other steps, procedures, and ultimately, environmental safeguards are invoked.

In summary, activities involving high levels of discretion and uncertainty are poor candidates for contracting, and in some cases contracting is legally prohibited. Tasks involving less discretion are more appropriate for contracting. Our objective is to offer a logical tool that does not require the Forest Service to reinvent the process of identifying NEPA tasks—the latter has been accomplished already in the Business Activity Model. However, the Forest Service, itself, must arrange the tasks in the different groups based on its own, on-the-ground, practice-based understanding of which tasks require more or require less discretion and are accompanied by greater or lesser amounts of uncertainty. Our own list is necessarily contingent on our own sense of the judgments required to perform the various NEPA tasks, and we recognize that particular contextual factors, including the composition of local Forest Service leadership, types of projects proposed that trigger NEPA actions, and other conditions, may affect perceptions of how tasks are best handled.

Re-engineering or restructuring how the Forest Service approaches the NEPA process involves major investments. Anticipating investments, and preparing for the transaction costs involved in changing business processes—and more broadly, in changing institutional culture—are vital agency considerations. The current Forest Service workforce has a high median age with a large percentage of workers nearing or eligible for retirement. Also, much of the current workforce was hired primarily for its technical expertise in a natural resource management field and may not be well-equipped to deal with business relationships found in contract environments nor with the social issues that increasingly dominate the NEPA process. Thus the opportunity costs associated with developing and deploying new strategies for hiring and training personnel to execute the agency's NEPA responsibilities—whether in the company or absence of contractors—will be substantial.

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