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## The meaning of the National Environmental Policy Act within the U.S. Forest Service

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### ABSTRACT

We conducted a survey of 3321 Forest Service employees involved in compliance with the National Environmental Policy Act (NEPA) followed by five focus groups to investigate agency views of the purpose of agency NEPA processes and their appropriate measures of success. Results suggest the lack of a unified critical task for Forest Service NEPA processes and that employees' functions relevant to NEPA influence their views of its meaning. Compared to other agency personnel, members of interdisciplinary teams who carry out most day-to-day NEPA-related tasks placed greater emphasis on minimizing negative environmental and social impacts, satisfying multiple stakeholders and avoiding litigation and appeals. Line officers, who typically serve as the decision makers following NEPA processes, placed greatest emphasis on efficient implementation and least emphasis on minimizing impacts. Advisory personnel placed greatest emphasis on effective disclosure of analyses and decision-making. We discuss the structural origins of these differences as well as their implications.

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### 1. Introduction

The National Environmental Policy Act (NEPA) became law in 1970, requiring that all federal agencies conduct an environmental analysis and fully disclose its results prior to carrying out any major actions with the potential to significantly impact the environment (42 USC Sec. 4321–4347). NEPA processes, as they are called, generally involve a number of prescribed steps following the development of a purpose and need for a proposed action, including scoping, alternatives development, interdisciplinary analyses of likely impacts of different alternatives, public involvement, and documentation. Since its passage, NEPA has come to infiltrate nearly every action undertaken by the Forest Service to manage the nation's 193 million acres of lands under its jurisdiction. In 2006 alone, nearly 8000 Forest Service employees were engaged in nearly 6000 NEPA processes at the cost of \$365 million (Management Analysis, Inc., 2007). Despite its omnipresence in agency planning, the Forest Service regularly struggles with many of the challenges associated with NEPA compliance, including staffing interdisciplinary teams, performing and disclosing complex environmental analyses to multiple audiences, conducting effective public involvement, and

coping with increasing litigation against the agency associated with the Act (Bear, 2003; Culhane, 1990; Keele et al., 2006; Malmshiemer et al., 2004; Poisner, 1996; Twelker, 1990).

Numerous attempts have been made to streamline NEPA processes (Baldwin, 2004; Luther, 2006; NECRAC, 2005; U.S. House of Representatives Task Force on Improving the National Environmental Policy Act, 2006). These attempts have commonly focused upon setting bounds on analyses, increasing the range of actions excluded from complete analyses, and other efforts focused on increasing efficiency. This research takes a step back from aiming to revise NEPA processes in the Forest Service by first asking, what do Forest Service personnel believe NEPA processes in the Forest Service are supposed to accomplish? Without a clear definition of what a successful NEPA process looks like, revisions to Forest Service NEPA compliance may not meet any specific objectives relevant to goals of the agency or the Act. In this paper, we examine agency perceptions of the purpose of NEPA and how agency personnel define a successful NEPA process. In a companion paper (Stern et al., 2010), we examine agency perceptions of the strategies that contribute to greater success in NEPA processes.

### 2. Defining NEPA's critical task

The importance of a clear critical task for NEPA is reflected in work conducted by James Q. Wilson in his widely-respected classic,

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Bureaucracy: What Government Agencies Do and Why They Do It (Wilson, 1989). Wilson's research suggests that only agencies with the most clearly defined critical task(s) achieve their best efficiency by granting wide discretion to street-level bureaucrats, or those who carry out day-to-day tasks and interact most directly with the publics they serve (Wilson, 1989; Lipsky, 1980). These agents may use the most context-appropriate means to achieve the clearly defined critical task. In other agencies, discretion at the street level can be problematic, as these agents become less predictable. Having a less clear aim, they may each shoot toward a somewhat different goal, which may or may not adequately reflect the goals of the agency. Alternatively, lack of a critical task can influence an over-emphasis on process or procedure, where agents shift their focus away from agency mission, concentrating rather on procedures as ends themselves (Merton, 1968; Stern et al., 2009; Wilson, 1989). The concept of the critical task and its associated implications for mission achievement may also apply within any given realm of an agency's activities. For example, if a critical task associated with forest health or restoration is not clearly defined, each implementing official may use his or her own interpretation to guide their actions (Predmore et al., 2008). Similarly, we might expect different conceptualizations of the critical task(s) of NEPA compliance to have similar implications.

Defining the critical task(s) of NEPA processes in the Forest Service must begin with an examination of the legislation itself. Section 101 of NEPA puts forth the official intent of the legislation to "promote efforts which will prevent or eliminate damage to the environment" while encouraging "a productive and enjoyable harmony between man and his environment" (42 USC § 4321), reflecting that NEPA was intended to be a means to the end of a healthier environment. Section 102 of the Act and associated Council on Environmental Quality (CEQ) regulations discuss the procedures through which this purpose is to be met. These procedures focus primarily upon the analysis and disclosure of the likely environmental impacts of proposed actions. Agencies typically put together interdisciplinary (ID) teams to accomplish this task.

In short, NEPA requires an environmental analysis and the full disclosure of its results for all major federal actions with the potential to significantly impact the environment. NEPA does not mandate or prohibit specific land management decisions, but rather aims to inform decisionmakers, other relevant agencies, and the general public about the environmental consequences of government actions through a set of general process requirements intended to achieve more environmentally appropriate outcomes (Dreyfus and Ingram, 1976; Caldwell, 1998). As such, NEPA was set up to meet its stated environmental quality goals by ensuring analyses of potential environmental consequences and through external pressures brought to bear by those reviewing NEPA documents, including criticisms from other agencies, court challenges, and public opinion (Dreyfus and Ingram, 1976; Lindstrom and Smith, 2001).

While there is general consensus among NEPA scholars regarding the specific process requirements of NEPA as described above, NEPA has come to mean many things to many people. Much of this might stem from ambiguities and uncertainty surrounding the original broader intent of the Act upon its creation (Culhane, 1990; Dreyfus and Ingram, 1976). Some regard NEPA processes as intimately linked to agency decision-making, while others view it as entirely separate from decision-making, merely representing a procedural hurdle to implementation<sup>1</sup> (Kaiser, 2006; Karkkainen, 2002; Stern and Mortimer, 2009). Views of NEPA's public

involvement components vary considerably as well, ranging from a means to merely inform the public through the disclosure of analyses to a means for the public to modify agency actions through direct participation in the process or through other political or legal actions (Force and Forrester, 2002; Poisner, 1996; Stern and Mortimer, 2009; Twelker, 1990). Still others have viewed NEPA as a means to advance ecosystem management (Phillips and Randolph, 2000) or as a tool for communications and/or public relations (Stern and Mortimer, 2009).

While numerous views of NEPA's critical tasks are present in the literature, no systematic inquiry has yet explored perceptions about NEPA from within the land management agency that performs more NEPA compliance than any other, the Forest Service (EPA, 2009). The Forest Service provides wide discretion for agency personnel for carrying out NEPA compliance, largely reiterating sections of the Act and CEQ guidance in its official guidance document (USDA Forest Service, 2007) and training materials (Forest Plan Implementation Course 1900–1901). The broad discretion afforded to field-level personnel suggests that the outcomes of these processes, which can be social, economic, managerial, political, organizational, and environmental, may be powerfully driven by the particular practices, dispositions, values, attitudes, situations, and beliefs of ID team members and the line officers and others who influence their behaviors. Evidence exists to support this claim (Stern et al., 2009; MacGregor and Seesholtz, 2008). This research examines whether a singular critical task or common set of critical tasks might apply to NEPA processes across the agency, or to groups of agency personnel who function similarly in agency NEPA processes. It also examines the potential implications and structural origins of agency perceptions about NEPA.

### 3. Methods

We conducted an online survey with Forest Service employees actively engaged in NEPA compliance. Following initial data analyses of the surveys, we conducted five focus groups with key personnel in the Washington, DC office, regional coordinators, and legal counsel involved in agency NEPA compliance.

The survey, administered using SurveyPro 4<sup>®</sup> software, contained closed-ended batteries of items relating to respondents' perceptions of the purpose of Forest Service NEPA processes, definitions of success in Forest Service NEPA processes, contributors to success, goals for public involvement in Forest Service NEPA processes, strategies for successful public involvement, and recommendations for improving Forest Service NEPA processes. This paper focuses on these first two batteries of survey items, which provided respondents with a seven-point Likert-type response scale. Survey items were developed through a prior pilot study involving 25 interviews with NEPA practitioners across four federal land management agencies (see Stern and Mortimer, 2009) and through an examination of related literature. Each battery of items was followed by an open comment box. These two comment boxes yielded 838 written comments, which we analyzed to identify additional concepts not covered in the closed-ended items and to help us better understand the meaning behind trends observed in the quantitative data. We coded these responses through an iterative process, identifying key cross-cutting themes and refining those themes and adding extra codes on subsequent passes through the data. We then sorted the data to identify patterns that might exist in the perceptions of those with different functions related to NEPA.

The sample for the internet survey was drawn from a database developed by Management Analysis, Inc. (2007) for the 2007 feasibility study of activities associated with NEPA compliance in the Forest Service and supplemented by a purposive selection of

<sup>1</sup> New implementing regulations (36 C.F.R. §220) attempt to make NEPA's link to decision-making more explicit. These regulations were published after the survey period.

**Table 1**  
Responses rates by location.

Location	Valid responses	Response rate (%)
Northern Region (R1)	360	47.6
Rocky Mountain Region (R2)	339	47.7
Southwestern Region (R3)	251	50.3
Intermountain Region (R4)	375	50.9
Pacific Southwest Region (R5)	361	45.1
Pacific Northwest Region (R6)	501	49.0
Southern Region (R8)	366	59.8
Eastern Region (R9)	398	57.4
Alaska Region (R10)	128	46.0
Enterprise Team <sup>2</sup>	51	63.8
Washington, DC	47	57.3
Total	3321	52.9

individuals in the Washington, DC office deemed to have a direct influence on how NEPA compliance is carried out within the Forest Service. Individuals within the Washington, DC office were identified through key informant interviews with the Forest Service's Assistant Director for the National Environmental Policy Act and others. The initial sample included 6277 individuals who received an email invitation to complete the survey online; 3321 individuals completed the surveys. The survey was open from May 7 to May 30, 2008. Three weekly reminder emails were sent to non-respondents. Table 1 shows response rates broken down by region. The overall response rate of 52.9% is conservative. Seventy-nine recipients' email addresses were invalid; an additional 24 recipients had either retired or left the Forest Service. Nineteen recipients replied that they were not actually involved directly in any NEPA processes. Moreover, at least 227 recipients were out of the office for at least part of the open survey period. No one who was out of the office for more than 20 days during the survey period responded to the survey. Adjusting for these non-respondents, a still-conservative response rate would be 54.4%. This could be considered an excellent response rate for a web-based survey (see Sheehan, 2001).<sup>3</sup>

Responses were entered into SPSS<sup>®</sup> software for analysis. We delineated four categories, or functional groups, of respondents based on respondents' dominant role in Forest Service NEPA compliance. Street-level "implementers" are those respondents whose primary or only role in agency NEPA compliance is to serve on ID teams as disciplinary specialists or as ID team leaders. "Line officers" include forest supervisors and district rangers who typically serve as the decisionmakers following NEPA processes. "Advisory" personnel are those who serve in a primarily advisory or policy-influencing role. These include regional coordinators, some NEPA instructors (those who teach internal training courses but are not typically on ID teams), and most respondents from the Washington, DC office. "Bridgers" are those individuals who regularly find themselves in both advisory and implementer roles. These were most commonly forest and district-level coordinators and planners, but also included NEPA instructors who regularly served on interdisciplinary teams. Means were calculated for each group, as were relative rankings of the importance of survey items in reflecting the perceptions of each.

Although we ran one-way ANOVAs with post-hoc tests for each battery of questions, student's *t*-tests are presented herein for clarity and simplicity. Our interpretations of the different statistical tests are identical. To conduct student's *t*-tests, an overall

<sup>2</sup> Enterprise teams are typically made up of disciplinary specialists who service multiple forests as interdisciplinary team members and are not directly associated with any one region.

<sup>3</sup> Sheehan (2001) reviewed response rates to 31 email surveys from 1986 to 2000 and found an average response rate of just under 37%. Fifteen studies conducted in 1998–2000 averaged response rates of only 31%.

standardized mean was calculated for each survey item using the overall mean for each group (advisory, line officer, bridger, and implementer). This process ensured that the overall mean was not unduly influenced by the larger sample size of those categorized as implementers.

Focus groups were conducted with advisory personnel as opportunities arose to explore differences in survey responses between those characterized as advisory personnel, line officers, and implementers. These advisory personnel commonly served in effect as internal consultants to line officers and implementers regarding NEPA processes within the agency. Moreover, most were once implementers. We thus thought they could provide a useful perspective to understand the differences between the functional groups we identified. The focus groups began with a presentation of the quantitative results from the surveys. Discussions focused upon the differences observed between employees with different roles in NEPA compliance within the agency. They lasted approximately 1 h on average. Participation in each ranged from five to over twenty participants.

#### 4. Quantitative results

Respondents were asked to rate the extent to which they felt each of the statements contained in Table 2 reflected the purpose of NEPA processes in the Forest Service on a scale from one to seven with three anchor points (1: Does not reflect purpose; 4: Somewhat reflects purpose; 7: Essential purpose). Respondents were then asked to rate the extent to which they felt each of the statements contained in Table 3 was an appropriate measure of success for Forest Service NEPA processes on a seven-point scale with three anchor points (1: Not important; 4: Moderately important; 7: Critical to measuring success).

To assess whether certain perceptions of NEPA's purpose and definitions of success were indicative of underlying latent perceptions, we ran exploratory factor analyses (using principal components extraction with varimax rotation) on each battery of survey items (Tables 4 and 5). Factors with eigenvalues greater than one were retained for analysis. The factor analysis revealed that perceptions of the purpose of NEPA processes in the Forest Service reflect two underlying latent factors. Perceptions of appropriate measures of success reflected four latent factors. Higher factor loadings shown in each table suggest a greater contribution to each underlying factor. Items whose factor loadings are bold and italicized in each column in Tables 4 and 5 were used to create indexes reflecting each latent factor. Items that cross-loaded on more than one latent construct were not included in the indexes for clarity of interpretation.

Table 4 displays the results of the exploratory factor analysis on respondents' perceptions of the purpose of Forest Service NEPA processes. The first latent factor, which we have labeled "Disclosure & decision-making," focuses on disclosing both environmental analyses and decision-making processes and on improving final decisions. The second latent factor reflects perceptions that NEPA should be used to address the needs and interests of multiple entities. We label this factor, "Transactional NEPA." Perceptions associated with this construct involve balancing multiple interests, improving relationships with external entities, and defending agency decisions from internal and external scrutiny and litigation. The construct also directly reflects Section 101 of NEPA through aiming to increase the environmental sensitivity of the agency, suggesting that normative factors are at play in achieving NEPA's stated environmental purposes.

Table 5 displays the results of exploratory factor analysis on respondents' definitions of success of Forest Service NEPA processes. The first latent construct, labeled "Effective disclosure,"

**Table 2**  
Mean scores on views of the purpose of Forest Service NEPA processes across roles in the Forest Service.

	Advisory (153)		Line officer (355)		Bridger (392)		Implementer (1948)		Overall standardized mean	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
Public disclosure of environmental analyses	1	6.41	1	6.41*	1	6.35	1	6.07*	1	6.31
Public disclosure of decision-making process	2	5.76	2	6.00*	2	5.85	2	5.59*	2	5.80
To improve final decision	3	5.41	4	5.31	5	5.18	5	5.05*	3	5.24
To provide a framework for decision-making	5	4.99	3	5.34	3	5.35	3	5.27	3	5.24
Giving stakeholders a voice in the decision-making process	4	5.10	5	5.28	4	5.21	4	5.11*	5	5.18
To expand consideration of alternatives	6	4.62	6	4.67	6	4.54	7	4.62	6	4.61
Balancing multiple interests	8	4.26	7	4.37	7	4.38	6	4.67*	7	4.42
To increase environmental sensitivity of agency actions	7	4.42	8	3.98*	8	4.18	8	4.42*	8	4.25
To improve relationships with the public and other stakeholders	9	3.93	8	3.98	9	4.06	9	4.19*	9	4.04
Protection from litigation	11	3.16*	10	3.22*	10	3.55	10	4.01*	10	3.49
A tool for internal communications	10	3.17	11	3.21*	11	3.46	11	3.67*	11	3.38

\*Indicates significant difference from standardized mean score (student's *t*-test) with Bonferroni correction ( $p < .0125$ ).

reflects a desire to effectively disclose NEPA analyses and related decision-making processes in a way that is accepted as legitimate by external stakeholders. The second construct, "Minimizing impacts," reflects a belief that successful NEPA should minimize negative environmental and socioeconomic impacts. The third construct, "Satisfaction & appeasement," reflects similar beliefs to those described above as "Transactional NEPA." In this case, respondents equate success with satisfying multiple stakeholders and avoiding litigation and appeals. The fourth construct, labeled "Efficiency & implementation," reflects a belief that success is moving through the process as efficiently as possible to get a project or plan implemented.

Both of the factors in the tables that reflect the importance of disclosure most directly mirror Section 102 of NEPA and CEQ regulations which describe the process requirements of NEPA. The "disclosure and decision-making" factor associated with perceptions of NEPA's purpose (Table 4) suggests that NEPA should also provide the framework for decision-making. The "Effective disclosure" factor associated with measures of success (Table 5) primarily reflects a well-done NEPA process that meets external expectations for disclosure.

The "Transactional NEPA," "Satisfaction & appeasement," and "Minimizing impacts" factors are each outcomes-based, moving

beyond NEPA's process requirements and CEQ regulations. These constructs stress the impacts of agency actions in both social and environmental terms. Meanwhile, the "Efficiency & implementation" factor is primarily about process efficiency, emphasizing getting through the process as smoothly and quickly as possible to move to project implementation.

Indexes of each of the latent factors described in Tables 4 and 5 were created by equally weighting and summing each of the dominant (bold and italicized) variables corresponding with each. Values were divided by the number of variables in each index so that each index would be measured on a scale from 1 to 7. Table 6 displays the means for each index and compares index scores across functional groups.

Respondents were also asked to select up to three statements they felt best reflect the purpose of Forest Service NEPA processes and up to three statements they felt to be the most appropriate measures of success. Tables 7 and 8 display the percentages of respondents selecting each survey item as well as the percentage selecting at least one item contained within each index.

Averaged responses suggest some general agreement across the agency as to the importance of public disclosure of environmental analyses and of decision-making processes as purposes of Forest Service NEPA processes. Some agreement was also observed

**Table 3**  
Mean scores on views of appropriate measures of success of Forest Service NEPA processes across roles in the Forest Service.

	Advisory (153)		Line officer (355)		Bridger (392)		Implementer (1948)		Overall standardized mean	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
Full disclosure of environmental analyses has taken place	1	6.40*	1	6.27	1	6.22	1	6.05*	1	6.23
Well-documented rationale for decision is developed	2	6.34**	1	6.27	2	6.18	2	6.02*	2	6.20
The project gets implemented	5	5.68	3	6.16*	5	5.74	5	5.69*	3	5.82
The decision-making process is made transparent to all stakeholders	3	6.01*	4	5.95*	6	5.69**	8	5.59*	4	5.81
All procedures are followed correctly	4	5.96**	7	5.66**	3	5.82	6	5.67*	5	5.78
The process employs the best available biophysical science	7	5.67	5	5.80	4	5.76	4	5.73	6	5.74
The final decision reflects the mission of the agency	9	5.42	6	5.72**	7	5.61	7	5.64	7	5.60
The final decision minimizes adverse environmental impacts	8	5.46	9	5.46	8	5.59	3	5.75*	8	5.56
The final document is easy to read and understand	6	5.69**	8	5.50	9	5.44	9	5.40*	9	5.51
Public participants are satisfied with the PROCESS	10	5.36	12	5.11	10	5.22	10	5.10*	10	5.20
The process employs the best available social science	12	5.21	11	5.18	11	5.05	12	5.01*	11	5.11
The process and decision are completed in a timely manner	13	5.20	10	5.30*	12	4.89*	11	5.03*	12	5.10
Other agencies are effectively engaged	11	5.25*	13	5.04	13	4.88*	13	4.93*	13	5.02
The final decision minimizes adverse socioeconomic impacts	14	4.78	14	4.72	14	4.69	14	4.81**	14	4.75
All team members are satisfied with the process	15	4.26	15	4.20	15	4.16	15	4.22	15	4.21
Public participants are satisfied with the FINAL DECISION	16	3.87	16	3.95	16	4.01	17	4.12*	16	3.99
Compromise has taken place between the interested parties	17	3.63	17	3.68	18	3.67	18	4.07*	17	3.76
No litigation or appeals	18	3.29**	18	3.58	17	3.78	16	4.16*	18	3.70

\*Indicates significant difference from standardized mean score (student's *t*-test) with Bonferroni correction ( $p < .0125$ ).

\*\*Indicates marginally significant difference from standardized mean score (student's *t*-test,  $0.05 > p > .0125$ ).



**Table 4**  
Factor loadings from exploratory factor analysis (principal components extraction with varimax rotation) on perceptions of the purpose of Forest Service NEPA processes.

Purpose Statements	Factor 1 Disclosure and decision-making	Factor 2 Transactional NEPA
Public disclosure of environmental analyses	<b>0.765</b>	−0.061
Public disclosure of decision-making process	<b>0.761</b>	0.019
To provide a framework for decision-making	<b>0.631</b>	0.277
Giving stakeholders a voice in the decision-making process	<b>0.644</b>	0.274
To improve final decision	<b>0.671</b>	0.334
To expand consideration of alternatives	0.523	0.482
Balancing multiple interests	0.267	<b>0.567</b>
To increase environmental sensitivity of agency actions	0.248	<b>0.608</b>
To improve relationships with the public and other stakeholders	0.297	<b>0.700</b>
Protection from litigation	−0.350	<b>0.608</b>
A tool for internal communications within the agency	0.071	<b>0.767</b>

regarding the statements that least reflected NEPA processes' purpose and appropriate measures of their success (Tables 2 and 3). With respect to NEPA's purpose, only one item's mean (NEPA as a tool for internal communications) was below the middle-point of the scale (4.0) for all four functional groups. The five least appropriate individual measures of success spanned across all four functional groups (Table 3). On average, implementers viewed all measures of success as at least moderately important (above 4.0).

Despite some general trends in the mean rankings, respondents' perceptions of the top three measures of success and purpose statements (Tables 7 and 8) suggest that a unified understanding of Forest Service NEPA processes does not exist across the agency. While two out of three respondents selected the top-rated item on the list, public disclosure of environmental analyses (Table 7), as a primary purpose of Forest Service NEPA, one-third viewed NEPA's primary purpose(s) in another manner. Mean scores also exhibited wide variance. The average standard deviation across all purpose items for all groups was 1.59. For success measures, the average standard deviation was 1.43. Line officers had the smallest standard deviations on average (1.49 and 1.35, respectively). Items regarding litigation and appeals exhibited the largest standard deviations (2.12 and 1.95, respectively), reflecting that respondents disagreed most widely on these items.

Different categories of employees tended to emphasize different concepts. Implementers stood apart from the rest of the agency in their scoring of most statements. In particular, implementers

placed greater emphasis on minimizing negative environmental and social impacts, satisfying multiple stakeholders and avoiding litigation and appeals than other agency personnel and somewhat less emphasis on disclosure and implementation. Advisory personnel placed greatest emphasis on effective disclosure. Line officers placed greatest emphasis on efficient implementation and least emphasis on minimizing impacts. More often than not, the views of bridgers were most closely aligned with implementers, though their perceptions did appear to numerically “bridge” between implementers and advisory personnel.

### 5. Qualitative results and discussion

Our qualitative analyses shed some light on the differences observed between functional groups, suggesting the importance of different accountabilities felt by those occupying different NEPA-related roles. Different roles within the agency are characterized not only by different tasks and rewards, but also by different demands and responsibilities. These responsibilities are both formal and informal, colored by individuals' perceptions of to whom or what they are most accountable. Formal accountabilities may be governed by legal obligations, incentive structures, and performance reviews. Informal accountabilities may include allegiance to a particular set of values or to particular audiences, such as local publics or a scientific community. Perceived accountabilities may have strong influences on individuals' attitudes and actions whether through formal

**Table 5**  
Exploratory factor analysis (principal components extraction with varimax rotation) on perceptions of appropriate measures of success in Forest Service NEPA processes.

Measures of success	Factor 1 Effective disclosure	Factor 2 Minimizing impacts	Factor 3 Satisfaction & appeasement	Factor 4 Efficiency & implementation
Full disclosure of impact analyses has taken place	<b>0.789</b>	0.212	−0.057	0.065
Well-documented rationale for decision is developed	<b>0.736</b>	0.186	−0.051	0.247
All procedures are followed correctly	<b>0.614</b>	0.045	0.027	0.230
The decision-making process is made transparent to all stakeholders	<b>0.743</b>	0.153	0.140	0.003
The final document is easy to read and understand	<b>0.559</b>	0.184	0.171	0.386
Public participants are satisfied with the PROCESS	<b>0.592</b>	0.059	0.354	−0.106
Other agencies are effectively engaged	<b>0.560</b>	0.210	0.304	0.167
The final decision minimizes adverse environmental impacts	0.180	<b>0.776</b>	0.204	0.081
The final decision minimizes adverse socioeconomic impacts	0.139	<b>0.802</b>	0.245	0.120
All team members are satisfied with the process	0.416	0.160	<b>0.525</b>	0.172
Public participants are satisfied with the FINAL DECISION	0.090	0.174	<b>0.763</b>	0.002
No litigation or appeals	−0.198	−0.050	<b>0.635</b>	0.345
Compromise has taken place between the interested parties	0.165	0.191	<b>0.745</b>	0.067
The project gets implemented	0.012	0.082	0.186	<b>0.773</b>
The process is completed in a timely manner	0.328	0.087	0.081	<b>0.668</b>
Cross-loading items				
The process employs the best available biophysical science.	0.584	0.509	−0.010	0.078
The process employs the best available social science	0.554	0.530	0.072	0.036
The final decision reflects the mission of the agency	0.253	0.464	0.007	0.462

**Table 6**

Mean scores on indexes reflecting respondents' views of purpose and success in Forest Service NEPA processes.

Purpose indexes	Advisory	Line officer	Bridger	Implementer	Overall standardized mean
Disclosure & decision-making	5.53	5.66	5.59	5.42**	5.55
Transactional NEPA	3.79	3.75	3.92	4.19**	3.91
Success indexes					
Effective disclosure	5.86**	5.69	5.64	5.54**	5.68
Efficiency & implementation	5.44	5.73**	5.32	5.37**	5.47
Minimizing impacts	5.21	5.09	5.14	5.28**	5.18
Satisfaction & appeasement	3.77	3.84	3.90	4.14**	3.91

\*\*Significant difference between groups ( $p < .01$  - student's  $t$ -tests).

or informal means (Merton, 1968). Our data suggest a number of different formal and informal accountabilities are at play in defining NEPA's critical task(s) in the Forest Service.

Formal accountabilities for Forest Service employees are primarily upward accountabilities (Ebrahim, 2005). They may feel accountable to the federal government and its policies, which represent the interest of all citizens, or to superiors within the agency. Upward accountabilities generally require bureaucratic procedures for accounting and procedural compliance (Weber, 1968). Forms need to be filled out and boxes need to be checked that certain processes took place in accordance with relevant policies-like NEPA, for example. Specific performance goals or metrics must be achieved.

Informal accountabilities can be internal or external to the agency (Ebrahim, 2005). Informal internal accountabilities can involve relationships amongst staff members, which may be dependent upon the nature of internal communications, consensus and disagreement, and varying forms of trust or distrust within an organization (Selznick, 1957: 129; Kramer and Cook, 2004). These accountabilities may often pose significant challenges in interdisciplinary settings, such as those present in NEPA processes. Another type of informal accountability could be considered outward accountability,<sup>4</sup> including perceived responsibilities to any number of different external reference groups, such as local publics, environmental or industrial interest groups, specific members of congress, or a scientific disciplinary community.

Our data from all sources (focus groups, open- and closed-ended survey items) suggest that line officers may have the clearest sense of a single dominant accountability: a formal upward accountability to deliver measurable on-the-ground outputs, whether they are board feet of timber harvested or miles of stream restored. Line officers are held accountable for these outputs through budgetary allocations made further up the line in the regional offices, national headquarters, or Congress. Survey responses revealed a strong emphasis on moving through the process as efficiently as possible and focusing primarily upon pre-determined "targets."

"A lot of what line officers are evaluated on are these quantifiable widgets that come out at the end."

"Targets (or money tied to targets) drive our Ranger's decision-making process."

Open-ended comments of line officers contained arguments to "get back to basics" and statements that NEPA is just designed to "inform and consider." Line officers in particular seemed frustrated by the expansion of NEPA beyond its statutory process requirements (toward transactional, appeasement, and impacts-related elements), lamenting that NEPA has become a "monster" that is "cumbersome, laborious, and excessive." Still, tremendous within-

group variability existed in open-ended comments, suggesting the presence of only a weak general trend.

Focus groups confirmed that advisory personnel commonly feel both upward and outward accountabilities. Their internal performance metrics commonly include positively impacting agency processes through white papers, directives, or trainings. Survey responses reflect that advisory personnel also feel an outward pressure to maintain the agency's image, with a stronger emphasis on externally legitimized disclosure whereby the process itself is of high quality, regardless of the final outcomes. A successful NEPA process is one that "fosters agency credibility" by reaching a decision that "comes as no surprise to the public" and where "supporting analyses are done right the first time".

Implementers find themselves pulled in many directions at once. As a result, a middling effect is seen in most statements generated by wide variability in their responses. Their primary upward accountability is to the line officer, who commonly emphasizes process efficiency. Being members of local communities and shielded to some degree from the direct upward pressures faced by line officers, they may commonly feel the greatest pull from direct external pressures from frequent interactions with local publics and other interest groups. As disciplinary specialists, implementers can also feel obliged to serve as advocates for their particular resource or as lone representatives and defenders of their disciplines, as reflected in one implementer's open-ended comment on the survey.

Team members should be satisfied that the effects on their resource area were effectively disclosed and considered. Limiting the extent of analyses of specialists or having an environment where they feel pressured to produce a certain conclusion about effects, rather than one based on best available science and analysis is very dangerous to the integrity of the process.

One potential explanation for implementers' stronger focus on outward accountabilities, particularly those involving the public, may be that NEPA is often the ubiquitous process in their work; it provides the playing field where multiple uses are balanced and environmental regulations are followed. In contrast, line officers and advisory personnel are less commonly embroiled in the routine work of NEPA on a daily basis. Although line officers sometimes play prominent roles in public hearings associated with NEPA, their general degree of official public and political interaction outside of NEPA is typically much broader. As a result, line officers and advisory personnel may more easily separate ideas associated with managing conflict with the public from NEPA mandates. NEPA, for the implementer on the other hand, is where most of this work can be achieved. As a result, their ideas about its purpose are more complex and varied.

Bridgers commonly serve in advisory roles and as members on ID teams at the field level. As such, they may represent a key middle ground for understanding NEPA within the agency. Consensus within this group about NEPA, however, was no clearer than it was

<sup>4</sup> Ebrahim (2005) refers to this form of accountability as "downward" accountability. We use the term "outward" to avoid any unintended value assertions about entities external to the Forest Service.

**Table 7**

Proportion of sample selecting each statement as one of up to three best reflections of the purpose of Forest Service NEPA processes.

Perceived purpose of Forest Service NEPA processes	Advisory (%)	Line (%)	Bridger (%)	Implementer (%)	Average selection across groups (%)	Total sample selection (%)
Disclosure & decision-making index*	<b>93</b>	<b>93</b>	<b>94</b>	<b>90</b>	<b>93</b>	<b>91</b>
Public disclosure of environmental analyses*	77	75	76	63	73	67
Public disclosure of decision-making process*	44	53	47	39	46	43
To improve final decision*	42	33	33	26	33	28
To provide a framework for decision-making	28	29	35	33	31	32
Giving stakeholders a voice in the decision-making process	28	34	28	30	30	30
Transactional NEPA index*	<b>43</b>	<b>38</b>	<b>48</b>	<b>57</b>	<b>46</b>	<b>53</b>
Balancing multiple interests*	18	16	17	25	19	23
Protection from litigation*	14	11	14	19	15	17
To increase environmental sensitivity of agency actions*	16	7	17	16	14	15
To improve relationships with the public and other stakeholders*	2	8	7	10	7	9
A tool for internal communications within the agency*	1	1	4	5	3	4
Item not in an index						
To expand consideration of alternatives	10	8	8	10	9	9

\*Significant difference between groups ( $p < .05$  – chi-squared tests).

for other groups. While they exhibited the fewest significant differences from the other groups in their survey responses, they still represented the extremes in a few cases.

The lack of clear consensus not only across, but also within, functional groups in the agency suggests that more is at play in determining perceptions of NEPA than merely the hat that one wears. While a standard training course does exist within the agency, competing perceptions about NEPA are apparent across all levels of the agency. This suggests that agency trainings and internal communications do not counteract the impact of different groups seeking to accomplish different critical tasks through NEPA. Moreover, the values of individuals, regardless of their positions within the agency came through loud and clear within the qualitative data. These values commonly reflected competing paradigms about the appropriate roles of public values vs. scientific expertise or other agency goals (e.g., economic

efficiency) in planning processes (Culhane, 1990; Poisner, 1996). Respondents in all functional groups disagreed about whether NEPA processes are a suitable venue for public deliberation or whether they should be expert-driven processes. Unifying these disparate voices around a singular purpose of NEPA would present a major challenge.

Within all four functional groups, however, there were perceptions that challenged what appear to be the dominant accountabilities for each. For example, although upward accountabilities seemed to predispose line officers to focus on NEPA as mainly a procedural hoop required for project implementation, some viewed NEPA in an entirely different fashion. Some implementers described line officers who “really use the NEPA process to improve decision-making,” or that try to “please all of the people all of the time.” Meanwhile, others reinforced the overall trend observed in the quantitative data.

**Table 8**

Proportion of sample selecting each statement as one of up to three most appropriate measures of success in Forest Service NEPA processes.

Measure of success	Advisory (%)	Line (%)	Bridger (%)	Implementer (%)	Average selection across groups (%)	Total sample selection (%)
Effective disclosure index*	<b>88</b>	<b>79</b>	<b>82</b>	<b>72</b>	<b>80</b>	<b>75</b>
Full disclosure of impact analyses has taken place*	42	40	41	31	39	33
Well-documented rationale for decision is developed*	36	37	33	28	33	31
All procedures are followed correctly*	22	18	24	17	20	19
The decision-making process is made transparent to all stakeholders*	24	23	16	13	19	15
Public participants are satisfied with the PROCESS	23	13	17	16	17	16
The final document is easy to read and understand	16	11	16	15	15	15
Other agencies are effectively engaged	2	1	1	2	1	1
Minimizing impacts index*	<b>23</b>	<b>25</b>	<b>32</b>	<b>38</b>	<b>30</b>	<b>35</b>
The final decision minimizes adverse environmental impacts*	23	24	32	38	29	34
The final decision minimizes adverse socioeconomic impacts	4	4	4	5	4	5
Satisfaction & appeasement index*	<b>8</b>	<b>9</b>	<b>12</b>	<b>18</b>	<b>12</b>	<b>16</b>
No litigation or appeals*	3	5	7	10	6	9
Public participants are satisfied with the FINAL DECISION	3	3	5	5	4	5
All team members are satisfied with the process	3	1	2	3	2	2
Compromise has taken place between the interested parties*	1	0	1	3	1	2
Efficiency index*	<b>40</b>	<b>46</b>	<b>41</b>	<b>38</b>	<b>41</b>	<b>40</b>
The project gets implemented*	38	40	36	31	36	33
The process is completed in a timely manner	8	13	10	13	11	12
Single items not in an index						
The final decision reflects the mission of the agency*	22	24	27	27	25	26
The process employs the best available biophysical science*	13	13	17	19	15	18
The process employs the best available social science	3	3	3	4	3	3

\*Significant difference between groups ( $p < .05$  – chi-squared tests).

I have seen, in my 30 year career, only a handful of line officers, in my opinion, who really used the NEPA process to improve the considerations they made in decision-making. Most of them instead, in my view, see NEPA as something to 'get through'. This becomes frustrating for resource specialists.

## 6. Limitations

While certain weaknesses are inherent in any survey methodology, some particular limitations may apply to this study. These limitations primarily relate to varying interpretations of the wording of the questions included in the survey. A small number of respondents reported that they were unsure whether they should align their answers about NEPA's intended purpose with how it is performed in the Forest Service or how they think it should be performed. When we fielded these questions, we instructed respondents to focus on the latter, which was our original intention. Cognitive tests of a pilot survey also revealed that most would in fact interpret the surveys in this way. Further, the question about appropriate measures of success may involve a more complex cognitive process than we expected. While we expected that most respondents would look at the questions in terms of how success might be defined, others may have specifically considered the difficulty involved in measuring specific outcomes. This may have influenced their responses, though we cannot accurately predict how. Additionally, some respondents clearly had some misgivings and anxieties about how their responses would be interpreted. One replied, "You are setting me up in the cross hairs of the organization". We expect that these feelings negatively impacted response rates. Finally, the survey may have caused tension within some respondents who wished to reflect the importance of a particular statement even though they may consider it to be outside the scope of NEPA. The converse might also be true. For example, balancing multiple interests might be a part of the planning process, but some respondents may perceive it to happen outside of their own particular definition of the NEPA process. Responses could have been affected in either direction by this phenomenon.

## 7. Conclusion

Ambiguities in NEPA guidance allow for broad discretion, which allows for the re-creation of NEPA's critical task(s) from process to process. As a result, a singularly defined purpose for Forest Service NEPA processes cannot easily exist within the system. While the tremendous variability in project-types and in the contexts in which the Forest Service works speaks to the need for context-specific strategies to meet planning goals, the lack of a singular critical task for Forest Service NEPA processes may spur more problems than it solves. One might imagine the consequences of this absence to include an inability to intelligently address revisions to agency-wide guidance, a tendency for centralized advisory staff tasked with trouble-shooting to be regularly blind-sided by unexpected complications in forest and district-level processes, and serious communications challenges between different functional groups and those from different geographic locations who have each developed their own solutions to NEPA-related challenges. The second paper in this series (Stern et al., 2010) addresses the question: in the absence of a singular vision of success, how do agency personnel believe they should best navigate their way through these processes given their varying perceptions of NEPA's critical task?

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## References

- Baldwin, P., 2004. Public Participation in the Management of Forest Service and Bureau of Land Management Lands: Overview and Recent Changes. Congressional Research Service. Report: RL32426.
- Bear, D., 2003. Some modest suggestions for improving implementation of the National Environmental Policy Act. *Natural Resources Journal* 43 (4), 931–960.
- Caldwell, L.K., 1998. Beyond NEPA: future significance of the national environmental policy Act. *Harvard Environmental Law Review* 22 (1), 203–239.
- Culhane, P.J., 1990. NEPA's impacts on federal agencies, anticipated and unanticipated. *Environmental Law* 20, 681–702.
- Dreyfus, D.A., Ingram, H.M., 1976. National Environmental Policy Act – view of intent and practice. *Natural Resources Journal* 16 (2), 243–262.
- Ebrahim, A., 2005. Accountability myopia: losing sight of organizational learning. *Nonprofit and Voluntary Sector Quarterly* 34 (1), 56–87.
- Environmental Protection Agency (EPA), 2009. Environmental impact statement (EIS) database. <http://www.epa.gov/compliance/nepa/eisdata.html> (accessed 21.08.09).
- Force, J.E., Forester, D.J., 2002. Public involvement in National Park Service land management issues. *National Park Service Social Science Research Review* 3 (1), 1–28.
- Kaiser, B.A., 2006. The National Environmental Policy Act's influence on USDA Forest Service decision-making, 1974–1996. *Journal of Forest Economics* 12 (2), 109–130.
- Karkkainen, B.C., 2002. Toward a smarter NEPA: monitoring and managing government's environmental performance. *Columbia Law Review* 102 (4), 903–972.
- Keele, D.M., Malmsheimer, R.W., Floyd, D.W., Perez, J.E., 2006. Forest Service land management litigation 1989–2002. *Journal of Forestry* 104 (4), 196–202.
- Kramer, R.A., Cook, K.S., 2004. Trust and distrust in organizations: dilemmas and approaches. In: Kramer, R.A., Cook, K.S. (Eds.), *Trust and Distrust in Organizations: Dilemmas and Approaches*. Russell Sage Foundation, New York, NY, pp. 1–18.
- Lindstrom, M.J., Smith, Z.A., 2001. *The National Environmental Policy Act: Judicial Misconstruction, Legislative Indifference, and Executive Neglect*. Texas A&M Press, College Station, TX.
- Luther, L., 2006. CRS Report for Congress: The National Environmental Policy Act: Streamlining NEPA. Order Code RL33267. Congressional Research Service, Washington, DC.
- Lipsky, M., 1980. *Street-Level Bureaucracy: Dilemmas of the Individual in Public Services*. Russell Sage Foundation, New York, NY.
- Management Analysis, Inc., 2007. Feasibility Study of Activities Related to National Environmental Policy Act (NEPA) Compliance in the US Forest Service. Management Analysis, Incorporated, Vienna, VA.
- Merton, R.K., 1968. *Social Theory and Social Structure*. The Free Press, New York, NY.
- Malmsheimer, R.W., Keele, D., Floyd, D.W., 2004. National forest litigation in the US courts of appeals. *Journal of Forestry* 102 (2), 20–25.
- MacGregor, D., Seesholtz, D., 2008. Factors Influencing Line Officers' Decisions About National Environmental Policy Act Project Design and Development. General Technical Report PNW-GTR-766. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR.
- National Environmental Conflict Resolution Advisory Committee (NECRAC), April 2005. Final Report Submitted to the U.S. Institute for Environmental Conflict Resolution of the Morris K. Udall Foundation. Morris K. Udall Foundation, Tucson, AZ.
- Phillips, C.G., Randolph, J., 2000. The relationship of ecosystem management to NEPA and its goals. *Environmental Management* 26 (1), 1–12.
- Poisner, J., 1996. A civic republican perspective on the National Environmental Policy Act's process for citizen participation. *Environmental Law* 26, 53–94.
- Predmore, S.A., Copenheaver, C.A., Mortimer, M.J., 2008. Ecosystem management in the US Forest Service: a persistent process but dying discourse. *Journal of Forestry* 106 (6), 339–345.
- Selznick, P., 1957. *Leadership in Administration*. Harper & Row, New York, NY.
- Sheehan, K., 2001. Email survey response rates: a review. *Journal of Computer-Mediated Communication* 6 (2). <http://jcmc.indiana.edu/vol6/issue2/sheehan.html> (accessed 21.08.09).
- Stern, M.J., Blahna, D.J., Cervený, L.K., Mortimer, M.J., 2009. Visions of success and achievement in recreation-related USDA Forest Service NEPA processes. *Environmental Impact Assessment Review* 29 (4), 220–228.
- Stern, M.J., Mortimer, M.J., 2009. Exploring NEPA Processes Across Federal Land Management Agencies. General Technical Report PNW-GTR-799. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland OR.



- Stern, M.J., Predmore, S.A., Mortimer, M.J., Seesholtz, D.N., 2010. From the office to the field: areas of tension and consensus in the implementation of the National Environmental Policy Act within the US Forest Service. *Journal of Environmental Management* 91 (6), 1350–1356.
- Twelker, E., 1990. Twenty years of NEPA: from decisionmaker's aid to decisionmaker's dread. *Land and Water Law Review* 25 (1), 119–132.
- U.S. House of Representatives Task Force on Improving the National Environmental Policy Act, Recommendations to improve and update the National Environmental Policy Act. Presented to Representative Cathy McMorris, Chairwoman, Task Force on Improving the National Environmental Policy Act and Task Force on Updating the National Environmental Policy Act, Committee on Resources, U.S. House of Representatives, July 31, 2006.
- USDA Forest Service, 2007. Environmental Policy and Procedures. Forest Service Manual 1950. USDA Forest Service, Washington, D.C.
- Weber, M., 1968. Bureaucracy. In: Gerth, H.H., Mills, C.W. (Eds.), *From Max Weber: Essays in Sociology*. Oxford University Press, New York, NY, pp. 196–244.
- Wilson, J.Q., 1989. *Bureaucracy: What Government Agencies Do and Why They Do It*. Basic Books, Inc., New York, NY.