

**Monitoring: The Missing Piece  
(A Scorecard of NEPA Monitoring)**

By

Ronald Bjorkland

October 2012

Capstone paper submitted in partial fulfillment of the  
Requirements for the Certificate in NEPA  
Duke Environmental Leadership Program  
Nicholas School of the Environment at  
Duke University  
2012

## Abstract

The U.S. National Environmental Policy Act (NEPA) of 1969 heralded in an era of more robust attention to environmental impacts resulting from larger scale federal projects. The appeal of this type of environmental legislation is evidenced by the number of other countries which have adopted NEPA's framework. Mandates to review environmental impacts, identify alternatives, and provide mitigation plans before commencement of the project are at the heart of NEPA. Such project reviews have resulted in the development of a vast number of reports and large volumes of project-specific data that potentially can be used to better understand the components and processes of the natural environment and provide guidance for improved and efficient environmental protection. However, the Environmental Assessment (EA) or the more robust and intensive Environmental Impact Statement (EIS) that are required for most major projects more frequently than not are developed to satisfy the procedural aspects of the NEPA legislation while they fail to provide the needed guidance for improved decision-making. While NEPA legislation recommends monitoring of project activities, this activity is not mandated, and in those situations where it has been incorporated the monitoring showed that the EIS was inaccurate in direction and/or magnitude of the impact. Many reviews of NEPA have suggested that monitoring all project phases, from the design through the decommissioning, should be incorporated. Information gathered through a well-developed monitoring program can be managed in databases and benefit not only the specific project but would provide guidance how to better design and implement future activities designed to protect and enhance the natural environment.

## Introduction

The policies and regulations that emerged from the National Environmental Policy Act (NEPA) of 1969 were designed to fill a vacuum in the nation's efforts to address serious environmental issues. Affectionately referenced as the Magna Carta or grand matriarch of US environmental laws, NEPA was born under the shadows of highly publicized environmental catastrophes (e.g., Cuyahoga River fire, 1969) and a proliferation of popular science publications highlighting environmental disruption caused by policy and project implementation (e.g., Rachael Carson's 1963 book *Silent Spring*). NEPA statutes

created a profound legislative framework with the goal to develop, guide and implement a pathway of actions to safeguard the health and well-being of the environment during the development and implementation of most federal projects. The statute's goal is to improve decision-making by incorporating environmental information into major federal project decisions and to encourage agencies to adopt environmental values in their internal practice and culture<sup>1</sup>. The ushering in of NEPA signaled not only a major policy shift at the federal level (and other levels of governance), but a national acceptance and institutionalization of a newer environmental ethic<sup>2</sup>. McMullen<sup>3</sup> observed that this ethic is comprehensive in character and that the environment must be viewed composed of complex and interrelated systems and that its health cannot be described by the status of disparate species or systems. Additionally, the ethic encompasses issues of economic growth, resulting depletion of resources, and intergenerational equity. In citing the role of the judiciary in interpreting the role of NEPA in national policy decisions, Czarnecki<sup>4</sup> noted that at least some of the federal courts feel NEPA should be concerned with a lack of ex ante consideration of actions that could foster harm to natural resources. Additionally, some federal courts have upheld the notion that NEPA's procedures should promote substantive changes in decision-making.

NEPA-generated mechanisms to improve government environmental performance forced agencies to consider external costs in project implementation, fostered a culture to examine the *modus operandi* (namely through the requirement to consider and evaluate alternative to the planned project), and facilitated development of robust mechanisms for agency and public scrutiny of major projects<sup>5</sup>. While NEPA is heralded as a watershed event in codifying government responsibility to safeguard the environment, it still contains elements that prevent it from the full realization of its goal. Criticisms of NEPA generally fall into two camps: the often-cited burden and confusion of procedural requirements and the failure to satisfy the substantive intent of NEPA. While not entirely missing in the reviews of NEPA performance, monitoring, especially post-project (or post-implementation) is not well- documented. The absence of robust discussion in policy reviews about both the intermediate and long-term effects of project implementation reflects on the interpretation of the procedural framework of NEPA, failure to embrace

the importance of project information feedback, and external conditions beyond the original scope of NEPA. The intent of this paper is to highlight the importance of post-implementation monitoring as both a scorecard of NEPA performance and as an essential tool in adaptive management in safeguarding the natural environment.

### NEPA: Background

NEPA has generally been cited as a major milestone in policy decision-making for the protection of the environment, and its framework has been modeled in other countries<sup>6</sup>. NEPA establishes policy, sets goals, and describes procedural guidelines to promote sustainable development and protection of the environment. It is a structured framework for decision-making; it requires any federal activity that significantly affects environmental quality and those activities that require federal permitting to produce and publicly disclose environmental impacts of the proposed action and an evaluation of alternative actions. In a review of the effect of NEPA on federal policy, Alfano<sup>7</sup> noted that “a common theme in all these studies is that NEPA has helped institutionalize environmental values in federal agencies. By integrating these values into the decision-making structures of organizations, NEPA has had a substantive effect on federal actions.” NEPA’s objectives are: 1) to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; 2) to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; 3) to enrich the understanding of the ecological systems and natural resources important to the Nation; and 4) to establish a unit within the Executive branch (the Council on Environmental Quality-CEQ) whose task is to ensure that Federal agencies meet their obligations under the NEPA Act. A review of the literature suggests that since the inception of NEPA more than 40 years ago only the first and fourth of these objectives have been fully realized and that second and third have not yet been satisfactorily met.

To meet its broad goal, NEPA must attempt to employ scientifically driven investigation of possible environmental impacts of the proposed actions. Inherent in this strategy was the assumption that the requisite “information needed to make sound policies supported

by science would be both easy and inexpensive<sup>5</sup>.” However, this information requirement places enormous demands on agency resources. For example, a full-scale environmental impact statement (EIS) typically is hundreds or even thousands of pages in length, and takes millions of dollars and months, if not years, to complete. Even when completed, however, the informational value of an EIS may be dubious. Litigation-averse agency officials, loath to be sued for failure to consider relevant information, are inclined to cram an EIS full of every scrap of data and analysis available, regardless of quality, resulting in bloated, indiscriminate documents. Acquisition and public notice of the information and the subsequent decision-making would be accomplished primarily through the formal application of assessment tools, namely Environmental Assessments (EA) and the more rigorous (and resource and time intensive) Environmental Impact Statements (EIS). The EIS process promotes the three goals of the NEPA process: enhancement of quality agency decision; democratic process through participation of public and concerned entities; and record of substantive review<sup>8</sup>. In identifying some of the roadblocks inherent in the NEPA structure, Mandelker<sup>9</sup> cited the complexity, redundancy and confusing set of procedures needed to decide if and the type of environmental assessment that must be prepared. This conundrum is, in part, the result of the statutory limitation of NEPA on agency actions that limit the scope of activity to individual agency decisions and projects and prevent application of actions to a “wider context where environmental values can be considered over a broader landscape.” Additionally, one of the most galvanizing and notable criticisms of NEPA is the amount of resources, effort and time required to satisfy the procedural aspects of the statute to the detriment of fulfilling its substantive objectives. Much of the criticism focuses on the procedural mechanisms and the cost-benefit ratio of the outcome.

In an effort to avoid the time delays and resource expenditure of doing an EIS, agencies increasingly are opting to include enough mitigation measures in a project to stay below the EIS-triggering threshold and therefore are not subject to the more demanding and data intensive EIS analysis. These mitigated Findings of No Significant Impact (FONSI) may do little to ensure that environmental impacts will not occur because of they often lack follow-up monitoring and other methods to assess cumulative short-term and long-term

environmental impacts<sup>5</sup>. NEPA legislation obliges a monitoring and enforcement program for any required mitigation action and the results of the mitigation monitoring efforts be made available for public scrutiny<sup>10</sup>.

Wilkinson<sup>11</sup> noted that in those instances where a mitigating action might be included as part of the EA or EIS or as part of the decision document, some agencies do not follow through with a formal mitigation and monitoring program even though the regulations may require a monitoring program for EISs in specific instances<sup>10</sup>. The CEQ report<sup>12</sup> noted that agencies do not collect long-term data on improving NEPA nor do they generally gather data on the effectiveness of mitigation measures. Lack of thorough follow-up monitoring and mitigation is all too often a flaw in NEPA implementation and reflective of the unfortunate lack of fulfillment of goals cited in Section 101<sup>11</sup>.

One difficulty with the standard NEPA approach is that it tends to be a one-time event; the analysis of environmental impacts is prepared, alternatives and mitigation measures are evaluated, the decision-maker (agency) chooses a course of action and the NEPA processes end at this point. Environmental protection is subsequently achieved only if the predicted actions and impacts (alternatives and/or mitigation measures) were accurately and adequately evaluated and the responsible agency(ies) correctly implement the proposal and performed all monitoring and mitigation measures to which it has committed. However, even in the most aggressive scenario, new information or changing circumstances are difficult to forecast and accommodate in advance<sup>13</sup>.

#### Monitoring: Background

A systematic method of collecting, analyzing and integrating data and information about the conditions, components, and processes of an ecosystem is key to understanding how the system will be effected by any major activity, such as dam building or removal, facility siting, etc.<sup>3</sup>. However, in most cases EAs and EISs serve only as predictive judgments since there seldom is follow-up monitoring or verification of the effects of the

action on the environment. While CEQ regulations<sup>14</sup> state that “agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases,” there is no overarching mandate to monitor the environmental impacts resulting from the project Record of Decision (ROD). The unwillingness of courts in test cases to require agencies to incorporate monitoring as part of the NEPA process<sup>13</sup> is another reflection of the failure of NEPA to satisfy the substantive intent of the statute, namely environmental protection. In cases involving FONSI decisions, monitoring implementation plans to ensure that mitigation measures are adopted successfully are not required under current regulations even though they may be recommended<sup>13</sup>. Additionally, NEPA does not require post-project monitoring except in specific situations even though such activities have been considered and guidelines established. Karkainen<sup>5</sup> noted that there have been very limited follow-on assessments of NEPA projects since NEPA’s inception in 1969, and these assessments demonstrated that the “EIS was wrong in direction and/or magnitude of the impact.”

Observers of NEPA<sup>15</sup> have argued from early in the history of the legislation for a significant and constant role for monitoring of the environmental impacts of any federal project. Canter<sup>16</sup> noted that responsible management requires consideration of both the predicted and actual impacts experienced throughout the life cycle of the project including the planning, implementation, operational and decommissioning phases and that a robust monitoring program should be incorporated into EISs. Karkainen<sup>5</sup> noted that “an across-the-board problem in the environmental law landscape is the absence or lack of baseline information about environmental conditions and stressors. This absence is usually a function of the costs involved in the establishment and operation of a monitoring system, and in the absence of specific identifiable threats to human and/or environmental health, government agencies charged with preparing environmental impacts are disinclined to make the investment of the requisite resources (costs). Resources currently allocated to monitoring are enforcement-oriented to ensure specific source compliance. Often such data are not reported in standard units or aggregated across sources, and therefore it has limited utility beyond source-specific enforcement.”

### Monitoring: Definition and Composition

Comprehensive environmental monitoring includes the suite of activities that provide data and information on the chemical, physical, geological, biological, other environmental, health, and social factors that may be affected by any planned major activity. Benefits of comprehensive monitoring include establishment of baseline conditions, documentation and management of experienced impacts, evaluation of effectiveness of mitigation efforts, validation of impact impacts<sup>16</sup>. Additionally, such information would provide valuable input to understand better how a particular system, or component thereof, functions and the type and intensity of the stressors that may trigger a response. Cooper and Canter<sup>17</sup> suggested the establishment of an environmental monitoring program as part of the NEPA procedures, and the data collected would become part of the baseline data for future assessments<sup>18</sup>. Clark<sup>19</sup> noted that the importance of a well developed environmental database and considers its absence as one of the greatest shortcomings of environmental assessments. While many NEPA projects have accumulated a wide variety of data and other project-specific information, this material often has limited value. The databases currently developed to support environmental assessments generally have many shortcomings that limit their functionality. They are developed to support assessments of different types of stress factors on different resources at risk; they are aggregated on significantly divergent temporal and spatial scales; and they are not subject to standard formats, quality assurance and quality control protocols, or other criteria that would help provide needed consistency.

Post-implementation monitoring is particularly useful for ensuring that mitigation measures are adequately implemented, environmental standards are met, and no impacts are encountered that are substantially different from those originally forecasted<sup>13</sup>. Such efforts also provide information and data that can be used to modify project activities and for future efforts. In effect, the data and other information will become the foundation of databases. Well-developed databases would help provide a hedge against the currently large investment of capital and time. As noted in the 2005 Task Force report<sup>20</sup> much of the effort of the environmental assessment reports is to develop a “bullet-proof” vest



against possible litigation. While this goal is laudable, it is another example of the emphasis placed on the procedural aspects of the legislation to the abandonment of the more critical goal of environmental protection.

In order to be maximally functional in providing a useful information base that can be incorporated into environmental decision-making, NEPA must adopt a philosophy and the attendant framework that includes monitoring as part of its procedural and substantive mandate. Raising the importance of monitoring to this level will require a concerted effort on the part of Congress, the CEQ and all agencies involved with NEPA<sup>16</sup>.

### Discussion and Conclusion

In a thorough and well-cited review article about some of the structural weaknesses of NEPA and suggestions to address them, Bear<sup>2</sup> petitioned for a tweaking of NEPA to keep the legislation relevant. Bear<sup>2</sup> cautioned that “To continue ‘business-as-usual’ NEPA practice neither matches the spirit of this remarkable piece of legislation (NEPA) nor guarantees its survival into the second half of this century. To avoid, at best, an ossified, mechanical approach to the NEPA process and, at worst, a direct or de facto repeal of important parts of NEPA, much work needs to be done.... Most of the attention understandably and, in the beginning of NEPA's implementation, necessarily has been focused on NEPA's pre-decisional requirements. But that single-minded focus has come at the cost of largely ignoring serious analysis of whether the predictions presented in NEPA analyses are accurate, whether promised mitigation measures are implemented, and, if so, whether they are effective. It is also the dynamic that has made NEPA documents the one-shot deals that they usually are, rather than the living libraries that they could become. Many responsible agency employees know that they should be monitoring their mitigation commitments and know that they are not capable of doing so. There have been a variety of obstacles over the years, but constant among them has been a lack of resources. Money for monitoring and mitigation, particularly in the absence of a particularly high-profile issue or binding agreement, is notoriously tough to get and, along with training for agency employees, always seems to be first on the budgetary

chopping block. Post-decisional NEPA has been like the dark side of the moon: one knows it is there, but in the world of government agencies, no one can see it.”

Many longitudinal reviews of the effectiveness of NEPA have concluded that while the statute represents a major thrust forward in the protection of the environment, most of the NEPA activity to date has been procedural and the substantive part of the legislation is lacking. Case law has demonstrated repeatedly that agencies must merely abide by the procedural aspects of the NEPA guidelines, and this does not guarantee the most environmentally friendly outcome<sup>21</sup>. Wieman<sup>22</sup> noted that the 2005 Congressional Task Force report<sup>20</sup> on efforts to improve NEPA reiterated the ineffectiveness of NEPA and highlighted specific actions needed to enable NEPA to meet its original goal. In a more blunt criticism of the current role of NEPA, Wieman<sup>22</sup> observed, “that while NEPA was enacted with a mission to protect and preserve the environment of the United States, the actual policies and goals of NEPA go relatively unconsidered and current legislation has deliberately undermined and undercut the values of NEPA. This leaves the Act without much effect in achieving the purposes that spurred its enactment”. Where sustained monitoring has been used in the past, it has focused on the implementation and mitigation efforts rather than identifying trends or long-term effects of the actions.

More than 25,000 federal Environmental Impact Statements have been prepared in compliance with NEPA since the inception of the statute. The total number of annual filings have decreased dramatically since the early years for the statute (from more than 5,800 in 1970-1972 to 450 in 2009) but their length and complexity have increased significantly (average or more than 740 pages in the year 2000<sup>20, 23</sup>). While these reports contain valuable project-specific information, satisfying project milestones and procedural needs has been the focus and scant attention and resources have been appropriated for the collection, management, analysis, and sharing of monitoring information. The needs and roadblocks to a more aggressive and robust monitoring effort, during the planning, implementation and post-implementation phases, have not been addressed adequately. NEPA practitioners and reviewing bodies have acknowledged this failure and have highlighted it as a major fault line in NEPA’s inability to meet its

substantive goal of environmental protection. Post-decision monitoring is widely viewed as a critical missing component in NEPA practice.

The obsessive focus on satisfying the procedural demands of environmental assessments (e.g., EAs and EISs) precludes the opportunity to utilize more effectively information collected and does not provide the incentives and framework for post-implementation (including post- decision) monitoring. Karkkainen<sup>5</sup> cautioned that in the absence of clear and carefully thought-out application pathways, more information will not be sufficient to ensure environmentally sustainable decision-making. However, there are enticing models which offer a framework for the collection and utilization of ongoing monitoring which would help ensure the legitimacy and appropriateness of the information used in the decision-making<sup>24</sup>. Post-decision monitoring would provide much needed beneficial services, including a check on the accuracy of their *ex ante* predictions about environmental impacts; enhancing the availability of database to all agencies for future decisions; enabling agencies to engage in continuous learning to improve assessment and decision-making capacity; facilitating adaptive management in implementing projects; and reducing the frequency of agency reliance on mitigation procedures as a means to avoid preparations of EISs and thereby directing attention to realizing the primary goal of NEPA<sup>24</sup>.

Despite the rather unremarkable record of improved NEPA monitoring efforts to date, there are well-illuminated pathways forward, and some progress has been made within the arena of federal agencies that must comply with NEPA regulations<sup>2</sup>. The broad frameworks of both the environmental management system approach and the adaptive management approach include post-decisional monitoring as a major component. Fortunately, many federal agencies are beginning to incorporate components of these management approaches, and therefore, have begun to factor in a more prominent and permanent role of monitoring into their environmental assessments. The challenge now is to develop the type of database framework nourished by project monitoring data that is both economically rewarding and provides improved environmental protection.

- 
- <sup>1</sup> AUSTIN, J. E., CARTER, J. M., KLEIN, B. D. & SCHANG, S. E. 2005. Judging NEPA: A "Hard Look" at Judicial Decision Making Under the National Environmental Policy Act. . *Environmental Law Institute*, 17 pp.
- <sup>2</sup> BEAR, D. 2003. Some Modest Suggestions for Improving Implementation of the National Environmental Policy Act. *Some Modest Suggestions for Improving Implementation of the National Environmental Policy Act*, 43, 931-960.
- <sup>3</sup> MCMULLEN, B. P. 2010. *Impediments to and Opportunities for Fulfillment of the Rational Comprehensive Intent of the National Environmental Policy Act*. Master, Nebraska.
- <sup>4</sup> CZARNEZKI, J. J. 2006. Revisiting the Tense Relationship Between the U.S. Supreme Court, Administrative Procedure and the National Environmental Policy Act. Milwaukee: Marquette University Law School.
- <sup>5</sup> KARKKAINEN, B. C. 2008. Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation. *Texas Law Review* 86, 1409-1444.
- <sup>6</sup> BROWN, H. L. 1997. Expanding the Effectiveness of the European Union's Environmental Impact Assessment Law. *Boston College International and Comparative Law Review*, 29, 313-334, TILLEMANN, W. A. 1995. Public Participation in the Environmental Impact Assessment Process: A Comparative Study of Impact Assessment in Canada, the United States and the European Community. *Columbia Journal of Transnational Law* 33, 337-439.
- <sup>7</sup> ALFANO, P. 2009. Procedure or Substance. *NEPA at 40: How a Visionary Statute Confronts 21st Century Environmental Impacts*. Washington, D.C.: The Environmental Law Institute and The Council on Environmental Quality.
- <sup>8</sup> NOTES 1982. EIS Supplements for Improperly Completed Projects: A Logical Extension of Judicial Review Under NEPA. *Michigan Law Review*, 81, 221-236.
- <sup>9</sup> MANDELKER, D. R. 2010. The National Environmental Policy Act: A Review of its Experience and Problems. *Washington University Journal of Law & Policy*, 32, 293-313.
- <sup>10</sup> See 40 C.F.R. sec. 1505.2(c).
- <sup>11</sup> WILKINSON, C. H. 1999. Improving the National Environmental Policy Act (NEPA) through ISO 14001. *23rd Annual Conference of the National Association of Environmental Professionals*. San Diego, CA.
- <sup>12</sup> COUNCIL ON ENVIRONMENTAL QUALITY 1997. The National Environmental Policy Act: A Study of Its Effectiveness after Twenty-five Years.
- <sup>13</sup> ECCLESTON, C. H. 2008. *NEPA and Environmental Planning: Tools, Techniques, and Approaches for Practitioners*, Boca Raton, CRC Press.
- <sup>14</sup> See 40 C.F.R. sec. 1505.3
- <sup>15</sup> See CANTER, L. W. 1993. The Role of Environmental Monitoring in Responsible Project Management. *The Environmental Professional* 15, 76-87, CANTER, L. W. & CLARK, R. 1997. NEPA Effectiveness- A Survey of Academics. *Environmental Impact Assessment Review* 17, 313-327, CANTER, L. W. & CANTY, G. A. 1993.

---

Impact Significance Determination: Basic Considerations and a Sequenced Approach. *Environmental Impact Assessment Review*, 13, 275-297, CLARK, R. 1994. Cumulative Effects Assessment: A Tool for Sustainable Development. *Impact Assessment*, 12, 319-331, MA, Z., BECKER, D. R. & KILGORE, M. A. 2009. The Integration of Cumulative Environmental Impact Assessments and State Environmental Review Frameworks. *Staff Paper Series No. 201*. St. Paul: University of Minnesota, MCMULLEN, B. P. 2010. Impediments to and Opportunities for Fulfillment of the Rational Comprehensive Intent of the National Environmental Policy Act. Master, Nebraska.

<sup>16</sup> CANTER, L. W. 1993. The Role of Environmental Monitoring in Responsible Project Management. *The Environmental Professional* 15, 76-87.

<sup>17</sup> COOPER, T. A. & CANTER, L. W. 1997. Substantive Issues in Cumulative Impact Assessment: A State-of-Practice Survey. *Impact Assessment* 15, 15-31.

<sup>18</sup> MA, Z., BECKER, D. R. & KILGORE, M. A. 2009. The Integration of Cumulative Environmental Impact Assessments and State Environmental Review Frameworks. *Staff Paper Series No. 201*. St. Paul: University of Minnesota.

<sup>19</sup> CLARK, R. 1994. Cumulative Effects Assessment: A Tool for Sustainable Development. *Impact Assessment*, 12, 319-331.

<sup>20</sup> UNITED STATES HOUSE OF REPRESENTATIVES 2005. Task Force on Improving the National Environmental Policy Act and Task Force on Updating the National Environmental Policy Act. Initial Findings and Draft Recommendations. *In: COMMITTEE ON RESOURCES* (ed.).

<sup>21</sup> SMITH, M. D. 2005. Recent Trends in Cumulative Impact Case Law. *National Association of Environmental Professionals Annual Conference* Alexandria, VA, WOODYARD, C. J. 2005. *A Look at the National Environmental Policy Act & Public Participation: Suggesting the Creation of a Sub-Council on Public Involvement*. [Online]. Available: <http://law.sc.edu/environmental/papers/200511/eas/woodyard.pdf>.

<sup>22</sup> WIEMAN, J. 2007. The reality of NEPA: Can the Act Realize its Potential. (National Environmental Policy Act of 1969). *Missouri Environmental Law and Policy Review*, 14, 393-420.

<sup>23</sup> HUMBOLDT STATE UNIVERSITY 2012. Environmental Impact Assessment Reports. <http://library.humboldt.edu/infoservices/FEIRsandEISs.htm#federal> Accessed October 5th, 2012. Humbolt State University Library.

<sup>24</sup> FLOURNOY, A. C., HALTER, H. & STORZ, C. 2008. Harnessing the Power of Information to Protect Our Public Natural Resource Legacy. *Texas Law Review*, 86, 1575-1599.