

BALANCING THE IMPACTS

Strengthening the Value and Rationale of Mitigation Measures under the National

Historic Preservation Act

Environmental Policy Act

Student Degree

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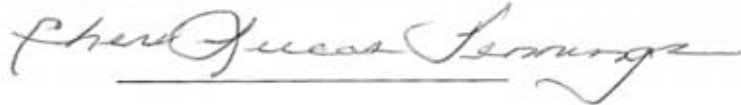
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A handwritten signature in cursive script that reads "Cheri Lucas-Jennings". The signature is written in black ink and is positioned above a horizontal line.

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ABSTRACT.....	vi
INTRODUCTION.....	1
PURPOSE OF THIS.....	1
SCOPE AND LIMITS OF.....	4
CHAPTER ONE. THE NATIONAL ENVIRONMENTAL POLICY ACT.....	11
INTRODUCTION.....	11
Preamble.....	11
Declarations.....	14
Findings.....	17
Title.....	18
Scope and Purpose of NEPA.....	19
Policy Statement.....	22
Key.....	23
© Copyright by Hibba Wahbeh, 2004. All rights reserved	23
CHAPTER TWO. HISTORICAL TRENDS IN AIR QUALITY REGULATION.....	24
INTRODUCTION.....	24
THE REGULATORY ENVIRONMENT.....	25
THE AIR QUALITY.....	25
Other National.....	28
Responsibility in California.....	30
THE CALIFORNIA AIR RESOURCES ACT.....	31
ENVIRONMENTAL IMPROVEMENT.....	32
The Role of the Planner.....	32
Other Air Quality.....	32
A survey of California Planning.....	33
Summary of Research.....	33
CHAPTER THREE. CUMULATIVE EFFECTS AND MITIGATION.....	41

ABSTRACT	VIII
INTRODUCTION	1
PURPOSE OF THESIS	3
STRUCTURE AND FORMAT OF THESIS	4
CHAPTER ONE. THE NATIONAL ENVIRONMENTAL POLICY ACT	5
INTRODUCTION	5
<i>History</i>	5
<i>Terminology</i>	6
<i>Ecology</i>	7
<i>Policy</i>	8
ENFORCEMENT OF NEPA	10
<i>Statutory Interpretation</i>	12
<i>Mitigation and the NEPA procedure</i>	22
CHAPTER TWO. RECOMMENDATIONS TO IMPROVE NEPA MITIGATION.....	24
INTRODUCTION	24
DETERMINATION OF MITIGATION MEASURES	24
<i>Risk Assessment</i>	25
<i>Ethical Rationality</i>	26
<i>Rationality of NEPA</i>	29
<i>CWA Section 404, a precedent for NEPA</i>	30
ENFORCEMENT OF MITIGATION MEASURES	32
<i>The Role of the Planner</i>	32
<i>CEQA AB3180, a precedent for NEPA</i>	33
<i>A Survey of California Planning Departments</i>	35
SUMMARY OF RECOMMENDATIONS FOR IMPROVING NEPA	39
CHAPTER THREE. CUMULATIVE EFFECTS AND MITIGATION	42

THE OHIO RIVER BRIDGES PROJECT	42
<i>Indirect and Cumulative Effects Analysis</i>	46
CUMULATIVE EFFECTS AND MITIGATION	48
CASE STUDY ANALYSIS	49
CHAPTER FOUR. DISCUSSION OF RECOMMENDATIONS FOR NEPA	52
REFERENCES	54

LIST OF FIGURES

FIGURE 1. THE NEPA PROCEDURE 16

FIGURE 2 LOUISVILLE METROPOLITAN AREA 43

LIST OF TABLES

TABLE 1. TWO TYPES OF ERROR IN TESTING HYPOTHESES 27

TABLE 2. FOUR PARADIGMS OF THE PLANNER 32

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BALANCING THE IMPACTS

STRENGTHENING THE VALUE AND RATIONALE OF MITIGATION MEASURES UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT

Hibba Wahbeh

Abstract

The National Environmental Policy Act (NEPA) of 1969 was developed to address growing public concern with environmental impacts caused by human activity. The NEPA process occurs with the general planning process of proposed federal projects in order to provide decision-makers and the public information about the potential associated environmental impacts. A brief history of the act is provided in this thesis along with an introduction and discussion of the substance, procedure, and enforcement of NEPA.

The NEPA process includes the analysis of mitigation measures for negative environmental impacts caused by proposed actions. The term mitigation describes efforts to offset the loss or impairment of functions and values of the environment. However, NEPA's mitigation requirements are vague. Mitigation could be at the heart of the NEPA process because it is one of the more direct means to account for the environmental costs of projects. Application of NEPA procedures reveals that the determination of mitigation measures tends to be based on pre-existing requirements and mitigation enforcement is lacking.

NEPA has the potential to provide a more solid backbone for the application of mitigation measures. In particular, the determination and enforcement of mitigation measures can be enhanced, thereby strengthening the value and rationale of mitigation measures under NEPA. This thesis offers NEPA two recommendations to improve mitigation based on precedents set by 1) the Memorandum of Agreement between the US Army Corps of Engineers and the Environmental Protection Agency on Section 404 permits of the Clean Water Act and 2) AB3180 of the California Environmental Quality Act.

In addition the Louisville-Southern Indiana Ohio River Bridges (ORB) Project is reviewed as a case study to provide insight on progressive mitigation for cumulative effects. Although jurisdictional issues tend to impede implementation of cumulative effects mitigation, trends show creative solutions to this challenge. The ORB project serves as an exemplary case for the positive evolution of mitigation measures under NEPA.

Introduction

Humans impact the environment in many ways. The effects of human activities on the environment can lead to social injustices, unsafe surroundings, a lack of biological, cultural, or natural resource diversity, and/or aesthetically displeasing environments. Human activities lead to direct, indirect, and cumulative environmental impacts, which over time produce environmental crises that affect human health and safety. For example, land development and urban growth are some of the dominant reasons for loss of and degradation to wetlands and critical habitats.

The National Environmental Policy Act of 1969 (NEPA) was enacted with the intention of explicitly considering environmental impacts during the planning stages of projects in order to encourage "productive and enjoyable harmony" between people and the environment (42 USC §4321). The most recognized product of the NEPA process is the Environmental Impact Statement (EIS), which compels federal agencies to comply with the act through a procedural "information-gathering and -organizing system" (Lindstrom & Smith 2001 p36).

Unfortunately, NEPA's substantive intent is meagerly met by the implementing procedures of each agency. The procedures outline routine administrative formalities for meeting the public disclosure requirements of NEPA. The actual intent, stated in the law's policy goals, is rarely realized in the NEPA process.

In particular, NEPA procedure fails to meet its substance during the determination and enforcement of environmental mitigation. In this thesis, the term mitigation describes efforts to offset the loss or impairment of functions and values of the environment. During project planning, mitigation is vital for diminishing the impacts of human actions.

Under NEPA the determination of mitigation measures is based on forecasted impacts and involves a combination of various disciplines, media, and levels of rigor. For example, even in one of the most developed mitigation assessments (wetland mitigation by transportation agencies), methodologies are guided by "regulatory requirements (replacement ratios), banking instruments, opportunities available in the area, and through negotiations with agencies" (National Cooperative Highway Research Program 2002 p15) while monitoring methods do not follow any standard procedures (National Cooperative Highway Research Program 2002). Although it is essential to rely on various methods to determine mitigation measures, NEPA's guidance on mitigation requirements is ambiguous, leading to indefinite implementation and enforcement.

Mitigation is an important element of NEPA since measures are explicitly designed to reduce the forecasted environmental impacts. However, mitigation under NEPA tends to be a consolidation of already existing requirements and common best management practice (BMP) recommendations. For instance, mitigation under NEPA typically includes general elements such as wetland mitigation, construction BMPs, and historic and cultural preservation, all of which are preexisting obligations by law. Section 404 of the Clean Water Act (CWA) requires mitigation for no-net-loss of wetlands. BMPs during construction are essentially forms of mitigation to prevent noise, air quality, and water quality nuisances and are typically conditions of permits required for construction projects. Historic and cultural preservation already require mitigation under the National Historic Preservation Act (NHPA).

It is important to understand the rationale and values applied to determine mitigation methods because impacts to the environment come at economic and environmental costs. Economic costs are made up of direct and indirect project costs quantified in dollars. Direct economic costs involve the expenditures necessary to carry out the project, such as materials, labor, and equipment. Indirect economic costs

involve the expenditures for transportation of materials, purchase of land, administrative costs, and insurance. The economic meaning of value translates to the monetary prices of goods and services. The costs of carrying out the project are typically allocated to one agency or organization. However, the prices of goods and services paid for by an agency do not include all the social costs, or the costs imposed on society, as a result of the project. This difference between the prices paid by the agency and the costs imposed on society is termed an economic externality.

Environmental costs may be defined as the direct and indirect modifications to environmental systems, including ecological, cultural and aesthetic resources. The environment provides essential ecosystem services such as soil fertility, pest control, and protection from ultraviolet radiation. Ecosystem services are not valued on the market-based system because quantitative prices do not indicate the value to society of the overall contribution of the service or resource, which is fundamental to human welfare. Environmental costs tend to be left to society and often times become economic externalities. Project costs to conduct environmental mitigation are typically labeled as indirect economic costs.

How can environmental planning, particularly under NEPA, improve the outcome of mitigation measures to account for environmental costs imposed by projects? Inclusion of preexisting mitigation requirements in the NEPA process is helpful but more importantly formulation of mitigation measures beyond these is central to improving NEPA's application. This thesis explores ways to improve mitigation under NEPA to meet the substantive values of the act.

Purpose of Thesis

Effective mitigation can help relieve the costs imposed by human activity. Environmental costs can be lessened with valuable planning, thereby reducing the long-

term economic maintenance costs. NEPA, a venue established for analyzing the environmental impacts of federal actions, has the potential to provide a more solid backbone for developing and enforcing mitigation measures.

Consolidating already-required mitigation measures during the NEPA process may not be the most rational approach to encourage "productive and enjoyable harmony" between people and the environment. However, the determination of mitigation measures is trivial if the measures do not get implemented effectively. The purpose of this thesis is to provide two recommendations, based on Section 404 permits of the Clean Water Act and the California Environmental Quality Act, for strengthening the rationale and value of mitigation measures in the NEPA process. These recommendations are intended for NEPA implementation at the national level rather than for a specific agency or geographic location.

Structure and Format of Thesis

This thesis is partitioned into several sections. This first chapter provides the objective of this thesis. Chapter two offers an introduction to NEPA, including its history and stated policy. Chapter two also introduces the NEPA procedure, the main mechanism that drives NEPA compliance. Two recommendations for improving the development and enforcement of NEPA mitigation measures are presented in chapter three. Chapter four presents the Louisville-Southern Indiana Ohio River Bridges Project as a case study and analyzes the mitigation measures developed under NEPA using indirect and cumulative effects analysis. Chapter five concludes the thesis with a discussion of the recommendations for improving the NEPA process.

Chapter One. The National Environmental Policy Act

Introduction

NEPA is the United States' first and only holistic environmental policy. The Act pronounces ecological goals for federal agencies and the nation as a whole. It also offers a procedural tool for federal decision-making and planning. The law requires federal agencies to consider environmental issues when reaching decisions. NEPA is the first attempt at a far-reaching and wide-ranging environmental law. About 100 nations have implemented variations of NEPA, suggesting the functional value of the Act. In order to understand the central objective of this thesis, it is important to introduce some basic information on NEPA.

History

Growing concern for the deteriorating environment was escalating in the early 20th century, leading to mounting public criticism in the 1950s and 1960s (Caldwell 1998). As the postwar 1950s American middle class began attaining wealth and satisfying their material needs, "post-materialist" values began to place greater concern for nonmaterial goods, such as cleaner air and water (Lindstrom & Smith 2001). Combined with the voiced concerns of academics and the occurrence of controversial natural crises Congress realized the need for a wide-ranging response.

Some of the first national environmental laws enacted include the 'Insecticide, Fungicide, and Rodenticide Act of 1947', the 'Water Pollution Control Act of 1948' and the 'Clean Air Act of 1955'. The 1960s saw a boost in the passage of additional environmental laws, including the 'Clean Water Act of 1960', the 'Wilderness Act of 1964', and the 'Solid Disposal Act of 1965'. Despite increased public interest in environmental legislation preceding NEPA, efforts to deal with ecological issues only

provided isolated and incremental results. Environmental issues were handled in a piecemeal fashion, each specific environmental media such as air, water, and endangered species, were treated separately from the others. According to noted policy analysts, segmented public policy at the state level lacked coherent, overall federal legislation (Lindstrom & Smith 2001).

Congressional support for a comprehensive national environmental policy evolved over a period of more than 10 years (Eccleston 1999). In 1959 Senator James Murray (Montana) introduced Congress to the Resources and Conservation Act. Sections of the bill were modeled after the Employment Act of 1946.

Murray's original bill did not pass Congress due to the broadness of jurisdictional issues inherent in natural resources conservation. At that time the concept of a holistic and interconnected environment had not entered mainstream thought. Natural resources are each governed independently by specific government agencies and these can overlap. For example, the water quality of a specific water well in a particular city can be influenced by adjacent cities. Hence a comprehensive approach to natural resources conservation was viewed as problematic due to jurisdictional overlaps.

Although Murray did not seek reelection in 1960, the Murray bill was reintroduced to Congress in 1961, 1963, and 1965 in several amended versions. Elements of Murray's original bill were eventually incorporated into the final version of NEPA. For example the declaration of policy and an advisory council in the Executive Office of the President are survivors of Murray's bill.

Terminology

Before the early 60's the connection between environmental problems, human health, and political solutions was not clear. Prior to the enactment of NEPA, federal agency decision-making typically concentrated on technology and economics (Bass et

al. 2001). The "environment" was differentiated from "natural resources" and "conservation". The value placed on nature can be seen by the distinction between "environment" and "natural resources". Economic utilitarian values define the concept of "natural resources conservation". The term "natural resource conservation" assumes that nature provides an endless source of materials for economic purposes (Caldwell 1998). The term "environment" serves as a holistic view of nature.

According to Lynton Caldwell an "environmental consciousness" was and continues to grow in the public arena (Caldwell 1998 p3). During the latter half of the twentieth century Western Europeans and North Americans began gaining awareness of the negative environmental impacts of human activities, including but not limited to population pressures, development, wildlife loss, and contamination. The public's value systems were expanding beyond the economic realm, into values not easily quantified; those of environmental health and well-being (Caldwell 1998). The term "environment" takes on this non-economic and generally non-quantifiable notion of value.

Ecology

Growing public dissatisfaction with environmental management by the federal government in the late 1960's was reflected in the number of congressional bills dealing with environmental issues.

Indeed, by the late 1960s, 120 members of Congress had bills dealing with environmental issues referred to nineteen separate committees of the House and Senate. Congressional observers felt this constituted a jurisdictional nightmare for formation of a comprehensive national environmental policy both within Congress (there was initially little coordination among the competing bills) and, should any of them become law, within the numerous agencies and departments designated in the bills (Lindstrom & Smith 2001 p30).

By 1967 ecology was gaining recognition as a "mainstream" science. Congressional awareness and acceptance of the need for a national environmental policy was quickly gaining momentum, as the correlation between the health of the environment and natural resources was made stronger. The House-Senate Joint

Environmental Colloquium in 1968 served as the catalyst for a uniform set of national environmental goals at the federal level. In 1968 Senator Henry Jackson (Washington) and Representative John Dingell (Michigan) introduced a bill that would eventually become the National Environmental Policy Act. After compromises within and between the Senate and the House the final bill that would become NEPA passed the legislature in December 1969. The jurisdictional controversies apparent to Congress when Murray introduced his bill were absolved for NEPA.

General concerns over ecological issues surfaced during the 1960's. These concerns stemmed in part from post-materialism, a history of environmental disasters such as the Cuyahoga River fire, and academic warnings such as Rachel Carson's Silent Spring. "Because environmental issues created a new constituency in the late 1960s and 1970s, there were political points to be won by politicians of every stripe by supporting environmental legislation" (Lindstrom & Smith 2001 p51). Richard Nixon enacted the bill with relative ease and minimal media attention on January 1, 1970.

Policy

NEPA is a short act made up of three main sections. The first section (Section 2) provides the essence, the basic substance, and the intentions of the act. The second section (Title I) states environmental policy goals and requires federal agencies to follow procedures to meet the intentions of the act. The third section (Title II) establishes the Council on Environmental Quality

First and foremost is the declaration of a national environmental policy aimed at minimizing environmental damage, promoting health and welfare, and enhancing environmental knowledge. The second section (Title I) states NEPA's all-encompassing environmental policy goals and creates specific administrative responsibilities for federal agencies. NEPA's policy goals require "the Federal Government to use all practicable

means, consistent with other essential considerations of national policy, to..." (42 USC §4331) realize intergenerational equity; ensure that the environment is safe, reliable, and pleasing for Americans; maximize benefits of and reduce costs to the environment; protect historical, cultural, and natural features while encouraging diversity; balance population pressures with available resources and equality; and improve pollution prevention measures. NEPA is to be integrated "to the fullest extent possible" into the missions of federal agencies (42 USC §4332). The act supplements all other national policies, regulations, and public laws.

Federal agencies are required to: use interdisciplinary approaches in environmental planning and decision-making; develop techniques to balance the qualitative or holistic values provided by environmental services with quantifiable economic and technical values; provide to the public a detailed statement for actions significantly affecting the environment and offer alternatives to these actions; acknowledge and assist international relations to avoid the decline of the biosphere; provide and utilize information to support environmental improvement and planning of projects; and assist the Council on Environmental Quality (CEQ). This second section is also known as the heart of NEPA since agencies' procedural requirement, or the "action-forcing" mechanism, stems from the requirement to prepare a "detailed statement" or the Environmental Impact Statement (EIS). The EIS is to include a description of the proposed federal action, "alternatives" to the action, and an evaluation of the environmental consequences of the action.

One of the most novel aspects of the Act as described by one of its authors Lynton Caldwell, was the establishment of a multiple member standing committee, the CEQ. The third section of the act (Title II) institutionalizes the CEQ, whose three members are appointed by the President and reside in the Executive Office. Although

the CEQ was meant to oversee NEPA and its implementation, it does not enforce NEPA. As discussed in the next section, enforcement has defaulted to the courts.

The CEQ advises the president on environmental policies and advises federal agencies on NEPA. CEQ's responsibilities include issuing guidelines to assist implementation of NEPA and developing and recommending to the President national environmental policies. Until recently the CEQ prepared annual reports on environmental quality, as required by NEPA, which would be sent from the President to Congress¹. The CEQ's existence has been shaky due to lack of funds, staff, and lack of utility by the President. In 1977, President Carter directed that the CEQ establish NEPA regulations in order to make the process more "uniform and efficient" (Bear 1989). These regulations are published as 40 Code of Federal Regulations (CFR) §1500-1508. Dinah Bear, a previous General Counsel to the CEQ, states,

"to some unmeasurable but significant degree, the regulations have proven successful. Many (though by no means all) federal agencies have improved their compliance with procedural requirements of the statute" (Bear 1989 p 10062).

Each federal agency is responsible for implementing NEPA consistent with their agency's mission. Besides the Act and the CEQ regulations, each federal agency has adopted their own NEPA implementation procedures. Section 105 (42 USC §4341) states that NEPA supplements the "existing authorizations of Federal agencies". NEPA enhances federal statutes and programs with major impacts to the environment, but it does not change their essential legal duty.

Enforcement of NEPA

NEPA is considered a procedural rather than a substantive statute. Compliance is based on fulfilling the NEPA process whose analysis typically results in documentation and demonstration that the agency has taken a "hard look" at the environmental impacts

¹ The requirement for CEQ's annual report was terminated as of 1999 due to the Federal Reports Elimination and Sunset Act of 1995.

of proposals. Enforcement of NEPA is encumbered by the variety of technical and qualitative information intrinsic to each federal action.

CEQ regulations state that, "the president, the federal agencies, and the courts share responsibility for enforcing the Act so as to achieve the substantive requirements of section 101" (40 CFR §1500.1[a]). Despite the explicit delegation of responsibility, the Act does not provide specific methods for enforcing NEPA. As a result of this, the actual method of NEPA enforcement has defaulted to litigation.

NEPA does not contain a "citizen lawsuit provision" as compared to other major environmental laws that followed (Lindstrom & Smith 2001 p105). Congress started to use the "citizen lawsuit provision" more regularly in the years following NEPA as a means for citizen enforcement. For example, the Endangered Species Act of 1973, the Toxics Substances Control Act of 1976, and the Clean Water Act of 1977 authorize citizen suit enforcement.

NEPA follows administrative rulemaking procedures for issuing decisions affecting the environment as defined in the Administrative Procedures Act (APA) of 1946. Administrative rulemaking procedures are also termed "notice and comment" (Kerwin 1999) rulemaking. Along with the APA, risk analysis has come to assist with current administrative rulemaking by providing a method for establishing thresholds in situations of uncertainty (Carlson 2003).

To gain legal standing under the APA, the plaintiff must prove (Lindstrom & Smith 2001 p103-105):

- Injury in fact, which means an invasion of a legally protected interest that is
 - Concrete and particularized, and
 - Actual or imminent, not conjectural or hypothetical;
- A causal relationship between the injury and the challenged conduct, which means that the injury fairly can be traced to the challenged action of the defendant, and has not resulted from the independent action of some third party not before the court; and

- A likelihood that the injury will be redressed by a favorable decision, which means that the prospect of obtaining relief from the injury as a result of a favorable ruling is not too uncertain

In addition, the right for a citizen to bring to suit a NEPA issue requires that "the plaintiff must have exhausted any available remedies" including commenting on an agency's action (Eccleston 1999 p314). Under the APA, legal review investigates if the NEPA process was "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law" (5 USC §7703) or if the NEPA process was conducted "without observance of procedure as required by the law" (5 USC §706).

NEPA's far-reaching and legally unprecedented environmental ideals and values have raised many questions related to enforcement of NEPA implementation. The Act's ambiguous legislation regarding implementation and enforcement can hinder its intended application. However,

"The lack of substantive standards provides planners with a great degree of flexibility in planning actions and is more than compensated for by a plethora of such standards in other environmental laws that can be identified and integrated within NEPA. The lack of enforcement mechanism at first created a vacuum, but this has been amply filled by the courts as parties have challenged agency actions under NEPA's provisions" (Eccleston 1999 p 23).

Citizen enforcement by means of litigation is usually sparked once the NEPA document is complete or the action has occurred. If federal agencies lose a NEPA court case they generally have to stop the action until the NEPA analyses and documentation suit the verdict.

Statutory Interpretation

Following up on NEPA litigation is an important way for agencies to keep updated on NEPA interpretations by the courts². To complicate matters, each court district has varying interpretations of NEPA implementation.

² The CEQ established a list of NEPA defining court cases, which was last updated in 1998 (<http://ceq.eh.doe.gov/nepa/nepanet.htm>). Schmidt (NEPA 2003 workshop) has a more recently compiled list indicating a wide range of enforcement issues under NEPA.

The first comprehensive court case that shaped the interpretation of NEPA was *Calvert Cliffs' v. Atomic Energy Commission*. The most famous outcome of this case was the distinction drawn between the substance (section 101) and procedure (section 102) of NEPA.

The procedural requirements of Section 102, which include the "detailed statement" or the EIS, are not flexible because they must be complied with "to the fullest extent possible" unless there is a conflicting statutory authority. Agencies must be in compliance with section 102 regardless of administrative difficulty, delay, or economic cost.

The substantive responsibilities of section 101 require agencies to "use all practicable means consistent with other essential considerations" to fulfill the procedural requirements of section 102. The interpretation of section 101 is flexible for it is based on the discretion applied by federal agencies. Unlike the procedural requirements of section 102, the substantive requirements of section 101 are not as easily enforceable. In essence, NEPA's substance is supplementary to the agency's mission, while its procedural requirements are obligatory.

Courts can easily fault a federal agency for failing to follow NEPA procedures or procedurally failing to consider environmental effects or alternatives to the proposed action. However, when it comes to the substantive requirements under section 101, the courts typically defer to the discretion of a federal agency, "unless it be shown that the actual balance of costs and benefits that was struck was arbitrary or clearly gave insufficient weight to environmental values" (Fischman & Squillace 2000 p153).

NEPA declares but does not impose the basic environmental values. Although the NEPA statute and regulations compel federal agencies to assess their actions in light of the declared values, it does not require agencies to minimize nor ameliorate their environmental impacts.

Different people perceive the term "environment" differently. When applying NEPA to proposed actions these philosophical distinctions provide the lens through which NEPA analysis is carried out and interpreted. The concept of the environment as a total system has been gaining popularity in the 20th century. Yet it still is not an active concept in American society (Caldwell 1998). The view of humanity as part of the holistic environment does not "appear to be fully comprehended by most people and their governments" (Caldwell 1998 p11). Public policy generally responds to disasters, or crises, with a cause-effect relation, such as spill-caused contamination, rather than view human tendencies as part of the equation. This crisis mentality misconceives environmental problems as resolvable through technical or legal one-time repair. In actuality, environmental disasters develop over time from multiple causes, institutional behaviors, and fragmented planning. NEPA is not designed to address these challenges productively.

In the NEPA Book a three-phase process is provided to determine if and how NEPA applies to proposed federal actions (Dase et al. 2001).

1. Screening for NEPA's applicability.
2. Prepare an Environmental Assessment (EA)
3. Prepare either a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement

An action may go through all three phases or it may stop at the first. This depends on the potential significance of the proposed action.

The CEQ NEPA regulations define a proposal's significance based on the combination of the proposal's context and intensity. The context describes the action's setting and scope. The CEQ NEPA regulations identify four different contexts: society as a whole, the affected region, the affected interests, and the locality (40 CFR §1508.27[a]). The intensity of an action's impacts also determines the significance of an action. The CEQ NEPA regulations provide 10 considerations for evaluating the

intensity of an action (40 CFR §1508.27(b)). The significance to which an action impacts the environment is a subjective determination.

Screening for NEPA's Applicability

Before a federal agency carries out, funds, or approves a proposed action it must first determine whether NEPA applies to that action. NEPA only applies to actions with federal discretionary authority, not ministerial actions. A very narrow and infrequent range of actions is not subject to NEPA requirements, regardless of their potential significance. These rare exemptions include emergency situations, explicit statutory exemptions, implicit statutory conflict exemptions, functional equivalency exemptions, and Presidential and executive office exemptions (Eccleston 1999 p112).

The frequency and types of actions that NEPA applies to are much more common than those that are exempt from NEPA requirements. Federal agencies must fulfill the NEPA process for proposals that are federal actions significantly affecting the quality of the human environment. The significance of an action is determined by the context and intensity of the environmental impacts as judged by the agency. When the natural and physical environment and the relationship of people with that environment will or may have an environmental effect NEPA analysis is required

Screening for NEPA's applicability should happen as soon as a proposal exists. The CEQ regulations define a proposal to exist either officially or unofficially when a federal agency *has a goal that it is actively preparing to decide* on one or more alternative means to accomplish the goal and the *effects can be meaningfully evaluated* (40 CFR §1508.23).

All federal agencies' NEPA implementation procedures identify NEPA procedural categories based on the significance of an action. The procedural categories include (see figure 1):

- o **Environmental Impact Statement (EIS)** for major federal actions with significant environmental impacts
- o **Environmental Assessment (EA)** to determine whether an EIS is necessary
- o **Categorical Exclusions (CATEX)** or actions with no significant effects

Each federal agency's functions and missions dictate the actions that fall within the CATEX category, but all actions that may or are anticipated to have significant environmental impacts must go through an EA or EIS process.

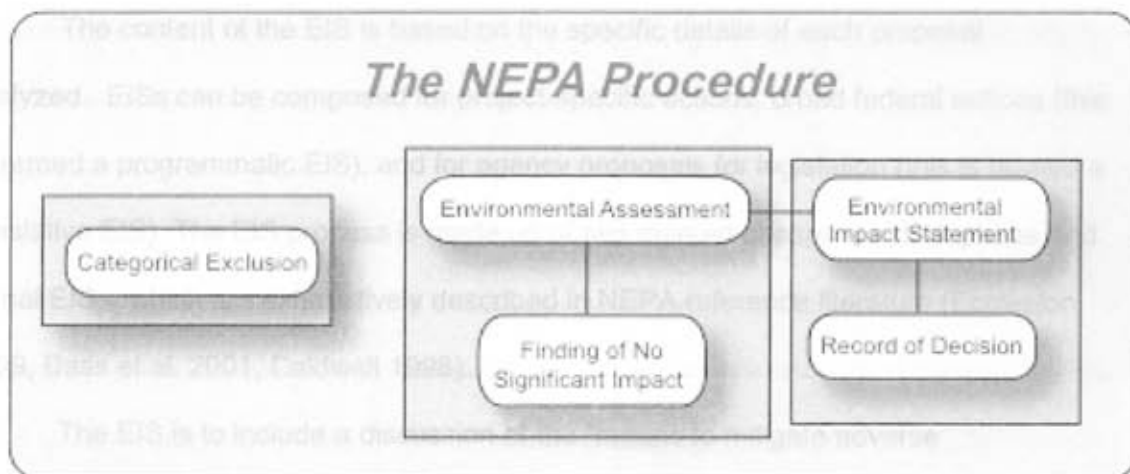


Figure 1. The NEPA Procedure

Environmental Impact Statement

While NEPA was being crafted in Congress, a man by the name of Lynton Caldwell, a political science professor at Indiana University and an assistant to the congressional committees formulating NEPA, introduced the concept of the Environmental Impact Statement (EIS), referred to as the "detailed statement" in the Act. Caldwell suggested the need for a mechanism to force agency compliance with NEPA. Caldwell's suggestion for the EIS requirement is termed the "action-forcing" mechanism for it requires preparation of an EIS utilizing a "systematic, interdisciplinary approach" (Section 102 (1)) for each proposed federal action with potential significant

environmental impacts. The intent was for the EIS to support the policy provisions of NEPA.

Without an "action-forcing" mechanism there would be no assurance of federal agency attention to the Act's general goals. The proposal and the alternatives in the EIS are to be treated equally with the same level of rigor for analysis. Despite the requirement for agencies to consider environmental effects, NEPA does not mandate that the alternative with the least environmental impact be selected.

The content of the EIS is based on the specific details of each proposal analyzed. EISs can be composed for project-specific actions, broad federal actions (this is termed a programmatic EIS), and for agency proposals for legislation (this is termed a legislative EIS). The EIS process is made up of two marked phases – a draft phase and a final EIS – which are exhaustively described in NEPA reference literature (Eccleston 1999, Bass et al. 2001, Caldwell 1998).

The EIS is to include a discussion of the "means to mitigate adverse environmental impacts" (40 CFR §1502.16(h)). Mitigation measures are developed through the NEPA process to offset negative impacts to the environment. Part 1508.20 of the CEQ regulations for implementing NEPA define mitigation to include:

- a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- e) Compensating for the impact by replacing or providing substitute resources or environments.

Mitigation measures determined during the NEPA process are considered adequate if they fall within the five categories listed above (Bass et al. 2001).

Record of Decision

Once the EIS has been finalized, the lead agency should make a final decision on the proposed action making use of the EIS contents. A Record of Decision (ROD) is prepared and published, which states the final decision, indicates the reasons a particular course of action is taken, and identifies the mitigation measures to be applied. The ROD is a judicially enforceable public document that may be used to assure compliance or implementation of the mitigation measures. Although the ROD is not technically a NEPA document as defined by the CEQ regulations (40 CFR §1508.10), it is deemed as such since agencies consider analyses in the EIS before reaching the final decision published in the ROD.

Although NEPA requires consideration of the environmental impacts of the proposal and alternatives, it does not mandate the criteria for decision-making. The agency does not have to choose the preferred EIS alternative nor does it have to choose the most environmentally sensitive alternative. In fact, agencies have complete discretion as to which alternative course of action to take, regardless of the outcomes of the NEPA process. (This "rationality" is discussed further in the following chapter.)

Environmental Assessment

An Environmental Assessment (EA) is necessary when a proposed federal action is subject to NEPA requirements, does not fall under the agency's CATEXs, and it is not readily apparent that the proposal may pose significant environmental impacts. The EA is the primary tool that federal agencies use to determine if an EIS is necessary. If the EA concludes that an EIS is not necessary, a Finding of No Significant Impact (FONSI) documents the reasons for this result.

The purposes of the EA are to provide evidence and analysis sufficient to determine whether an EIS is required; aid a federal agency's compliance with NEPA

when no EIS is necessary; and to facilitate preparation of an EIS when one is necessary (40 CFR §1508.9(a)).

When drafting the NEPA regulations, CEQ anticipated that the EIS would be the principal document for analyzing impacts of proposed actions (Eccleston 1999 p138). However, the EA has proven to be the most readily used process for investigating impacts. A CEQ study revealed that there are 100 times more EAs produced annually than there are EISs (CEQ 1991).

Since the EA was considered less important than the EIS during the inception of the CEQ regulations, EA guidance is scarce. This "lack of definitive direction has led to confusion, inconsistencies, and increased litigation" related to EAs (Eccleston 1999 p149). The EA has become a surrogate for the EIS, and hence EIS principles found in the CEQ regulations are typically applied to EAs (Bass et al. 2001 p45). The CEQ has advised that the EA be a concise document. However there are many instances when the EA reaches the size and scope of an EIS.

An EA may result with either a Finding of No Significant Impact (FONSI) or it may result with the preparation of an EIS.

Mitigated FONSI

A Finding of No Significant Impact (FONSI) is prepared if an EA demonstrates that the proposed action poses no significant environmental impacts. The FONSI provides the reasons that the selected alternative does not pose significant impacts based on the evidence in the EA, and consequently that an EIS is not necessary.

If an EA reveals that a proposed action has the potential for significant environmental effects and the proposal is amended to include mitigation measures to

reduce these effects, then agencies justify the application of a mitigated FONSI³.

Despite the increasing trend to prepare "Mitigated FONSI's", their concept and definition is not provided by the CEQ. Mixed rulings from the courts make it debatable whether a mitigated FONSI is legally binding.

In general, a "mitigated FONSI" may be supported if the additional mitigation measures are integrated into the proposal and the forecasted impacts have no significance. The mitigation measures should be sufficiently detailed and address mitigation of impacts in a meaningful manner. Mitigation measures should not be "mere vague statements of good intentions" (Audubon Soc. of Cent. Arkansas v. Dailey, 977 F.2d 428, 435-36 (8th Cir. 1992)) and postponed for future decision-making. An explanation of the effectiveness of the mitigation measures must be stated. Monitoring environmental impacts and consultation are not considered forms of mitigation under NEPA and therefore would not support the "mitigated FONSI" (Schmidt 2003).

If an EA demonstrates that the proposed action poses "significant" impacts than an Environmental Impact Statement (EIS) is required.

Categorical Exclusion

Categorical exclusions (CATEX) encompass activities that are minor, routine, or ongoing with no potential to cause significant environmental effects. If an action falls under a specific CATEX then an Environmental Assessment and an Environmental Impact Statement are not required and the action may proceed with no need to consider alternatives to the proposed action. The CATEX process aids agencies with screening out "non-significant" actions to focus their efforts on potentially significant actions.

CATEXs are specified in an agency's NEPA regulations.

³ Criticism has been made that mitigated FONSI's are a way to avoid an Environmental Impact Statement. The NEPA Task Force recommends that the CEQ clarify the concept of a mitigated FONSI and whether the agency is legally bound to the mitigation measures (NEPA Task Force 2003 p69 and p73).

Occasionally, normal day-to-day activities that typically fall under a CATEX pose extraordinary circumstances or generate questionable effects to the environment. For example, if an action that may be normally defined by a CATEX is placed in the context of a sensitive community or has controversial information, the designation of a CATEX is not appropriate. These occasions warrant an EA or an EIS. The inclination of the courts is to defer to agency discretion in the interpretation and application of CATEXs.

However, there have been court cases where an agency's choice of a CATEX was determined to be "arbitrary and capricious" (Eccleston 1999 p133).

For example, a few cases have arisen when the impacts of the proposal are reduced enough by mitigation measures to correspond to an agency's specific CATEX definitions. The validity of this practice is unclear although courts tend to uphold the agency's decision to apply a CATEX to a mitigated proposal. Currently no CEQ guidance is available to address the applicability of mitigation measures in CATEX's.

That courts have clarified that presence of mitigation measures does not automatically require an EA or EIS (*Alaska Center for Environment v. U.S. Forest Service*, 189 F.3d 851, 860 (9th Cir. 1999)). If the agency shows that their decision is not "arbitrary and capricious", the proposal is not an "extraordinary circumstance", and the impact is not "significant" then applying mitigation to reduce impacts to the point that a CATEX applies tends to be upheld by courts⁴. There are no requirements to document CATEXs to demonstrate that actions actually underwent NEPA review. Other agencies view the CATEX documentation as redundant since it is "documenting the fact that an action does not have to be documented" (Eccleston 1999 p133).

⁴ (Citizens for the Scenic Severn River v. Skinner, 802 F.Supp. 1325, 1333 (D. Md. 1991); Friends of Richards-Gebaur Airport v. F.A.A., 251 F.3d 1178, 1188 (8th Cir. 2001); Friends of Pioneer Street Bridge Corp. v. F.H.W.A., 150 F.Supp.2d 637, 653 (D. Vt. 2001))

Mitigation and the NEPA procedure

When an EIS is finalized and the lead agency has made their decision on the course of action to follow, the ROD is prepared to document this. The ROD shall also:

State whether all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not. A monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation (CEQ 1978 Section 1505.2(c)).

Once these mitigation measures become part of the ROD they are judicially enforceable.

In the case of EA's, mitigation measures become part of the FONSI, and it is unclear whether these are legally enforceable. Although the CEQ has discouraged the use of mitigated FONSI's, courts have overturned this recommendation. Considering that federal agencies issue about 1000 times more EA's than EIS's (CEQ 1991), it is important to define the concept of a mitigated FONSI and its enforceability as suggested by the NEPA Task Force (2003).

The mitigated CATEX has also become a more common occurrence with mixed reactions from the courts. The enforceability of mitigated FONSI's and mitigated CATEX's is debatable. It is required practice for the inclusion of mitigation measures in EISs to reduce significant environmental impacts of proposed actions. However, the growing practice of including mitigation measures in the NEPA process for the CATEX and EA analyses requires scrutiny on the part of the CEQ. The definition and enforceability of the "mitigated FONSI" are necessary components for instilling the recommendations put forward in this thesis.

The NEPA procedure is the method for implementing the intent of the Act. The effectiveness of meeting the intent may be gauged by criticism, legal proceedings, and the emergent qualities of accomplished projects that have undergone the NEPA process. Ample examples found in literature advise for improvement in the NEPA

procedure in order to meet its substance (Fairfax 1978, Culhane et al. 1987, Caldwell 1998, Lindstrom & Smith 2001, and CEQ 2003).

One crucial area that needs strengthening is the value and rationale of mitigation measures under NEPA. NEPA lacks procedure and guidance for determining and enforcing mitigation measures. If NEPA's intent is to be realized, the requirement to consider environmental impacts should be strengthened by more effective requirements for the amelioration of these impacts. The following chapter provides two recommendations for improving mitigation measures under NEPA.

Determination of Mitigation Measures

It is not a requirement for the determination of mitigation, as dictated by the CEQ, to be completed in a particular order, sequentially or cyclically. More typically, determination of mitigation measures is a result of a broader, ongoing process of analysis, which is based on best professional judgment of the environmental and social impacts of a project (Hollander, "Improving the NEPA Mitigation Process" 2002).

Lindstrom and Smith suggest that the integration of the provisions in the NEPA process may provide the "best" approach for ensuring projects fully comply with NEPA and federal decisions with regard to environmental impacts (Lindstrom & Smith 2001 p130). This thesis does not advocate the use of a "best professional judgment" method to determine mitigation measures under NEPA. However, the provisions related with a focus on critical uncertainty issues provide a more clearly approach for the determination of mitigation measures during NEPA analysis.

Chapter Two. Recommendations to Improve NEPA Mitigation

Introduction

Mitigation projects are probably one of the most, if not the only, environmental factor accounted in cost-benefit analyses, the most influential method to determine project feasibility (Clarke 1995). The public and decision-makers expect the implementation of mitigation measures identified in the NEPA process to lessen the significance of environmental impacts as a condition of project approval. The importance of defining and enforcing mitigation measures go a long way to reducing environmental costs of human impacts analyzed under NEPA.

Determination of Mitigation Measures

It is not a requirement for the five categories of mitigation, as defined by the CEQ, to be considered in a particular order during NEPA analysis. Most typically, determination of mitigation measures is based on information derived from resource-specific studies or best professional judgment of the environment and occurs on a case-by-case basis (National Cooperative Highway Research Program 2002).

Lindstrom and Smith suggest that the integration of risk assessment in the NEPA process may provide the "teeth" necessary for federal agencies to fully comply with NEPA and to avoid decisions with negative environmental impacts (Lindstrom & Smith 2001 p135). This thesis does not advocate the use of a "one-size-fits-all" method to determine mitigation measures under NEPA. However, risk assessment coupled with a focus on ethical rationality could provide a more orderly approach for the determination of mitigation measures during NEPA analysis.

Risk Assessment

Risk analysis has become a present-day administrative tool for federal agency rule and decision-making.

The Administrative Procedure Act and the risk analysis approach are the substantive constituents of contemporary administrative rulemaking. Administrative rulemakers, in response to the APA's reticence with regard to decision making procedures, developed and reified the risk analysis approach (Carlson 2003 p12).

Risk analysis is made up of two elements – risk assessment and risk management. The risk assessment portion characterizes risk to human health and ecosystems based on the form of hazard, the degree of exposure to the hazard, and the probability of effect due to being exposed to the hazard. Rather than collect information through scientific experiment risk assessment relies on probabilities and assumptions based on direct observance, which provides the basis for the risk management process. Together with other considerations – such as the social, cultural, and political contexts – the risk management process results with decisions and actions to reduce risk.

Although an element of risk analysis, risk assessment may be used independently.

Risk analysis is a useful but imperfect tool, typically relying on assumptions to deal with uncertainties. These assumptions center on value judgments, which are necessary when prioritizing risks and making decisions.

"This is not a weakness of comparative risk analysis. It is an explicit recognition of the fact that in the final analysis, the choice between disparate environmental expenditures is a political decision. However, risk analysis can provide a scientific framework in which to make these political decisions" (U.S. Congress 1991).

Using risk assessment tools to assist NEPA analysis would require consideration of the hazards imposed to human health and ecosystems, and benefits of the proposal.

The real or perceived benefits are generally considered justification for the activity being evaluated . . . Thus, a risk-benefit or a cost-benefit analysis is implicit in a decision making process involving risk assessment, even if the actual existence or extent of the benefits is not explicitly examined in a formal risk-benefit or cost-benefit analysis (O'Brien 2001 p5).

An integration of the costs and benefits of the proposal and the environmental impacts need to be derived more explicitly.

A Ph.D. dissertation by Gordon Mitchell Clarke (1995) investigated a methodology for integrating economic and environmental factors to determine project feasibility. The dissertation included data collected from 91 government field offices, including the Bureau of Reclamation, State Departments of Transportation, and the U.S. Army Corps of Engineers. Survey responses indicate that current practices in large construction project feasibility determination include formal, well-developed processes for economic feasibility involving cost-benefit techniques; separate summary and comparison process for environmental feasibility; and a lack of integration of economic and environmental feasibility due to high priority of economic consideration during the planning process and the subjective categories designed for valuation (Clarke 1995).

Clarke found that most survey respondents claimed the integration of economic and environmental feasibility "only requires that mitigation that can be monetized is to be moved to the economic account of a project" (p83). Costs of mitigation measures may be one of the more direct methods of placing an economic value on the environment.

Since mitigation provides an immediate way to economically account for environmental impacts it is important to strengthen the way mitigation measures are determined in the NEPA process. Risk assessment and cost-benefit analysis can better benefit the determination of mitigation measures if more weight is given to ethical rationality.

Ethical Rationality

When providing information to decision-makers in situations of uncertainty, scientists must make value judgments as to which risks are preferable. Shrader-Frechette & McCoy (1993) discuss risk prioritization, inherent to environmental decision-

making, based on statistical inference⁵. They arrive at the conclusion that specific statistical errors (value judgments) should be preferred over others when making environmental decisions.

One method of statistical inference includes decision-making using hypothesis testing based on sample data from a population. Hypothesis testing involves a null hypothesis (H_0) and an alternative hypothesis (H_1). The null hypothesis is a statement of no effect. In cases of environmental decision-making the null hypothesis typically takes the form, "this development project has *no effect* on the environment". The alternative hypothesis is a statement of effect. In this case, the alternative hypothesis typically takes the form, "this development project has a *significant effect* on the environment". The alternative hypothesis may be analyzed for both negative and positive effects, but is typically formulated for assessing negative impacts of proposals. As opposed to the definition of significance in the NEPA process, which relies on qualitative determinations of context and intensity, a significant effect in the statistical context is based on numeric evidence and probability.

One of the main objectives of statistical inference is to avoid two types of statistical errors when making decisions. Table 1 outlines the two types of error in significance testing.

	H_0 is true	H_1 is true
Reject H_0	Type I error	Correct decision
Accept H_0	Correct decision	Type II error

Table 1. Two types of error in testing hypotheses

Type I error occurs when a true null hypothesis is rejected. In other words, a type I error occurs if a significance test results with the conclusion that there *will* be a

⁵ Deep-rooted debates exist on whether to use statistical inference for decision-making. Yet making decisions based on inferences drawn from sample data is used in day-to-day decisions.

significant effect to the environment if the proposal moves forward, when actually the effects would have been minimal or non-existent. In this case the decision-maker would not move forward with the proposal because of the false prediction of inflated consequences.

Type II error occurs when there is failure to reject a false null hypothesis. In other words, a type II error occurs if a significance test results with the conclusion that there *will not* be a significant effect to the environment if the proposal moves forward, when actually there would be. In this case the decision-maker would move forward with the proposal because of the false prediction of diminished consequences.

Type I errors may be described as "developer risk" and type II errors as "public risk" (Shrader-Frechette and McCoy 1993). Shrader-Frechette and McCoy's (1993) argument centers on which of these errors is riskier, value judgments on whether to minimize type I or type II errors are inherent to the decision-making process.

Under current practice, decision-makers usually prefer to minimize type I errors in favor of type II errors. This preference is speculated to arise for a variety of reasons including a preference for scientific rationality and a close association between decision-makers and developers. Scientific rationality is built under the "rigorous reluctance to accept positive results" (Shrader-Frechette and McCoy 1993 p157).

In order to minimize type-I errors, scientists design studies to guard against the influence of all possible confounding variables, and they demand replication of study results before accepting them as supporting a particular hypothesis (Shrader-Frechette and McCoy 1993 p157).

Ecologists must make methodological value judgments since ecology lacks universal methods (Shrader-Frechette and McCoy 1993). Scientific uncertainties and the character of ecology lead Shrader-Frechette and McCoy to argue that ecologists have a moral obligation to minimize type II errors in favor of type I errors. Hence, value judgments in ecology should minimize "public risk".

"...all things being equal, it is more important (on prima-facie grounds) to protect the public from (type-II errors) not rejecting a seriously harmful environmental impact than to protect it from (type-I errors) rejecting a harmless impact. This is at least in part because protecting from serious harm seems to be a necessary condition for enjoying other freedoms..." (Shrader-Frechette and McCoy 1993 p160-161).

This preference to minimize type II errors is termed ethical rationality for it serves public and environmental interests. Ethical rationality allows for public consent, compensation, and equal protection (Shrader-Frechette and McCoy 1993).

Rationality of NEPA

As described by Simon (1947), the rational-comprehensive decision-making process⁶ requires that decision-makers:

1. Agree on the goals of a decision,
2. Identify all alternative courses of action relevant to the goals,
3. Identify all relevant consequences of each alternative, and
4. Compare consequences and decide on the optimum alternative.

Decision-makers do not have complete knowledge and lack ability to fully predict consequences of actions. To even closely reach the ideal of complete knowledge or full prediction power, "almost all organizations would find that the marginal costs of systems analysis greatly exceed the marginal benefits of an optimum . . . decision" (Culhane et al. 1987 p260-261). With limited funds and resources,

Testing whether real-world governmental officials' act like rational-comprehensive analysts seems about as fair as challenging your grandmother to an arm-wrestling contest. However, we ought to expect certain things from environmental impact statements (Culhane et al. 1987 p 262).

NEPA requires concurrent review of environmental consequences during the planning stages of projects. Nevertheless, it does not mandate the selection of the most environmentally beneficial alternative.

NEPA mandated a truncated rational decision making process...NEPA did not establish an order for goals in the process or require them to reach an optimal decision (Culhane et al. 1987, p10).

⁶ Although this paper does not delve deeply into the concepts of rationalism, it is important to note that the rational-comprehensive model is an ideal. To conduct environmental analyses using the rational-comprehensive model would be very expensive, if feasible.

EISs are supposed to be useful to decision-makers and the public rather than serve as an exercise in fulfilling procedural requirements. However EISs tend to stop short of providing rationality in the decision-making process because "an order for goals" or attaining "an optimal decision" is not a NEPA requirement.

The rational model presented above is not specifically the intent of NEPA's congressional sponsors. The model, however, tends to be supported by NEPA's scientific and technical enthusiasts (Culhane et al. 1987).

Rather than focus on the rational-comprehensive model, it has been argued that the CEQ NEPA regulations serve as a better model for environmental analysis under NEPA (Culhane et al. 1987). One of the ultimate purposes of NEPA, as stated in the CEQ NEPA regulations, is,

[N]ot better documents but better decisions that count. NEPA's purpose is not to generate paperwork--even excellent paperwork--but to foster excellent action (40 CFR §1500.1(c)).

Federal agencies seem better able to respond to rule-based regulations than those that emphasize planning. The explicit system of penalties in rule-based regulations drive agencies to place higher priority to funding programs that operate based on these regulations. A proactive strategy to environmental planning would be an optimal strategy to improve the effectiveness of planning-based regulations such as NEPA (Rubenson et al. 1992). An example of a mechanism to encourage proactive planning and to improve the rationale of NEPA is provided by the Clean Water Act's Section 404 permit.

CWA Section 404, a precedent for NEPA

Section 404 of the Clean Water Act (CWA) is specifically directed towards regulating discharge of dredged or fill material into waters of the U.S., which includes wetlands. Projects that propose filling (including any soil movement) or disposal of

dredge into waters of the U.S. require a permit through section 404. The U.S. Army Corps of Engineers (Corps) and the EPA manage section 404 requirements.

In 1990, the Corps and EPA signed a Memorandum of Agreement (MOA) concerning the determination of mitigation under CWA section 404(b)(1) guidelines. The MOA sets the goal for no net loss of the nation's wetlands⁷ and calls for mitigation "sequencing", an incremental method to determine the mitigation measure with the least environmental impacts.

NEPA's definition of mitigation is partitioned into five categories: avoid, minimize, rectify, reduce over time, and compensate. The MOA combines these mitigation categories into three general types: avoidance, minimization and compensatory mitigation. Measures to offset unavoidable impacts are determined in a particular order. Once avoidance and minimization of impacts are determined as either not appropriate or practicable, the remaining impacts are offset by compensation. It is the goal and practice for CWA section 404 permits to be analyzed for achieving the no net loss of wetlands goal through mitigation sequencing. In essence the goal strives to keep the total area of wetlands in the nation from decreasing.

Since it is the intent of NEPA to reduce costs to the environment, a more precautionary determination of mitigation measures for all environmental aspects under NEPA is warranted. The Section 404 sequencing method for determination of mitigation measures provides an example for NEPA to establish a much-needed general order for goals in the process. Agencies would be required to demonstrate that mitigation measures for all environmental aspects were derived following a sequential order.

⁷ This goal may not be reached with every permit action, but is meant as an overall national goal.

Enforcement of mitigation measures

The Role of the Planner

NEPA is a planning policy implemented through regulations by federal agency planners and planning departments. The role of planners in regulatory agencies is partly shaped by their consideration of the intent of environmental policies and regulation. It is assumed that tension exists between those who consider environmental policies and regulations as means to protect the environment and those who consider environmental policies and regulations as means to inform the public and decision-makers of environmental impacts (Wein 2000).

The role of the planner can be grouped into two characteristics – knowledge and purpose – to define four paradigms for the role of the planner (Wein 2000) as shown in table 2.

		Purpose	
		Unity of Purpose Provide objective information	Inherent Conflict Certify environmental protection
Knowledge	Absolute Knowledge "demonstrable, provable, and certain information"	Functionalism Planner as "scientist"	Radical structuralism Planner as "warrior"
	Relative Knowledge "different values involved in the administration of regulation"	Social relativism Planner as "facilitator"	Neo-humanism Planner as "emancipator"

Table 2. Four Paradigms of the Planner

Adapted from Wein 2000

The role of the planner in the functionalism paradigm is for impartial distribution of information to the public and decision-makers in order to achieve an underlying program objective. In this paradigm planners are likened to "scientists" because they seek goals consistent with the "ideal technical economic rationality" (Wein 2000 p29). As a "warrior" in the radical structuralism paradigm the planner serves to protect the environment by patrolling for negative environmental impacts and advocating or guarding the public's interest. In the social relativism paradigm, the planner acts as a

"facilitator" with the public and the development community. In this paradigm planning departments may negotiate with project proponents, and hence acknowledge the inability of policies and regulations to realize the purpose of comprehensive plans. In the neo-humanism paradigm, the planner is likened to an "emancipator", one who teaches the public and decision-makers about planning proposals and their consequences with the intention of achieving public consensus on plan implementation.

The role of the planner heavily shapes the outcome of the NEPA process. It is important to note the dual role of the planner under NEPA. NEPA's policy goals include providing information to the public and decision-makers (unity of purpose) and protecting the environment (inherent conflict).

CEQA AB3180, a precedent for NEPA

The California Environmental Quality Act (CEQA), adopted in 1970, essentially mirrors NEPA in form and function. Some of the main differences between NEPA and CEQA include the timing of procedural requirements, mitigation requirements, and public involvement.

CEQA requires agencies to implement feasible mitigation measures identified in CEQA analyses. Mitigation feasibility determination under CEQA was typically defined by the economic costs of a project (Wein 2000). "In practice, public agencies often define as 'infeasible' any level of mitigation tending to undermine the economic viability of a desired project" (Wein 2000 p45). Although CEQA requires agencies to identify mitigation measures, agency disregard for implementation of mitigation measures existed (Wein 2000). No verification requirement was in place to check on the implementation of mitigation measures. The California state legislature in 1989 provided evidence of pervasive neglect of mitigation requirements. To remedy this deficiency,

Assembly Bill 3180 (AB3180) was passed, requiring agencies to ensure implementation of adopted mitigation commitments by establishing a monitoring or reporting program.

Under CEQA, the public and/or other agencies may suggest mitigation measures. An agency with jurisdiction over the natural resources affected by the proposal may suggest mitigation measures for a proposed project. These mitigation measures must be limited to the legal authority of this agency. This same agency must provide a monitoring or reporting program for their proposed mitigation measures if *requested by the lead agency. Also, detailed performance objectives for the mitigation measures or functional equivalent guidelines to achieve the objectives must be provided to the lead agency⁸ by the agency suggesting the mitigation measures.* Lead agencies are only required to adopt a monitoring or reporting program for mitigation measures agreed upon in the CEQA process.

Lead agencies are required to find a means to commit proponents to the mitigation measures. This mechanism to assure enforcement can be done through permit conditions and agreements.

The general consensus among environmental document practitioners was that AB3180 gave additional responsibility and authority to planners to ensure that promised mitigation measures would indeed be implemented; in this regard, planners felt empowered by the legislation to be a 'warrior' (or cop), to act in an enforcement role to ensure compliance with the mitigation measures committed to the public (Wein 2000 p52-53).

However, NEPA, similar to CEQA, does not establish authority for agencies to carry out or enforce mitigation measures.

Under CEQA guidelines it is recommended that agencies meet with proponents to determine mitigation measures for lessening environmental impacts of a proposal. In this setting the planner acts as the "facilitator" to negotiate a solution to the impacts of a proposal. The monitoring and reporting requirements of AB3180 suggest that the

⁸ "Lead agency" means the public agency that has the principal responsibility for carrying out or approving a project, which may have a significant effect upon the environment.

planner serves to ensure there are no violations in order to protect the environment. However, if the monitoring and reporting program does not include a mechanism to halt a project for failing to implement a mitigation measure then the planner is just collecting information as either a "scientist" to calculate data or a "facilitator" to expedite the proposal despite noncompliance.

A Survey of California Planning Departments

Wein conducted a survey of 301 California planning departments in 86 cities regarding mitigation monitoring and AB3180 (Wein 2000). The survey data revealed that the main sources of mitigation measures in CEQA documents come from planning and other city departments. Planning departments lean towards a regulatory role rather than serve as a means to involve the public during mitigation determination.

Also Wein found that under CEQA's AB3180,

The reliance on meeting and conferring with developers who are not in compliance with required mitigation measures and other less effective means of enforcement implies that either planning departments may be sympathetic to the development community or unsure of their power to ensure compliance. This may be due to the initial ambiguous legislation or the very nature of the planning department being in a reactive and regulatory mode (Wein 2000 p159).

Some of the mitigation monitoring problems identified by survey respondents include that it is time consuming since it takes staff away from other tasks and that it is costly in particular due to the lack of trained staff.

To overcome some of these problems and to assist with the full implementation of the intended mitigation monitoring under CEQA, Wein suggests five legislative recommendations to CEQA (Wein 2000). These recommendations for improving CEQA can serve as preliminary considerations for integrating mitigation monitoring or reporting requirements in the NEPA procedures. *If mitigation monitoring becomes a required part of the NEPA procedure, the hurdles experienced in CEQA can be prevented.*

(1) Cost recovery and technical staff resources

The most notable factor for the feasibility of mitigation monitoring implementation under CEQA appears to be lack of professionally trained staff (Wein 2000). Section 21089 of CEQA authorizes agencies to "charge and collect a reasonable fee from any person proposing a project subject to [CEQA] in order to recover the estimated costs incurred for procedures necessary to comply with [CEQA] on the project".

Although cost recovery for CEQA procedures is explicitly stated in the legislation, it is still perceived as ambiguous, especially regarding mitigation monitoring requirements (Wein 2000). Wein found that although most cities have cost recovery for CEQA, lead agencies might not be fully utilizing that authority to recover costs for CEQA procedures. Wein recommends that the section 21089 of CEQA be changed to explicitly include in cost recovery the preparation of a mitigation monitoring and reporting program and the implementation of the program for the duration as specified in the monitoring and reporting program.

Currently, there is no designation of cost recovery for mitigation monitoring in the NEPA process. If mitigation monitoring were enforced under NEPA the issue of cost and the responsibility of payment is a foreseeable problem. Explicitly delegating federal agencies the authority to recover mitigation monitoring costs from the proponent ensures that the proponent is well defined and that monitoring will happen.

(2) Role of building and planning departments in mitigation monitoring

Wein found that the planning department conducts most mitigation monitoring and reporting. However, data indicates that cities which rely on their building department or a combination of their building and planning departments to conduct mitigation monitoring, consider their mitigation programs as performing better than those who only relied only on the planning department (Wein 2000).

Wein recommends that CEQA be amended to require agencies to combine the mitigation monitoring and reporting program of proposed projects with building department inspections "to the fullest extent possible". The lead agency would be required to track resources expended on site inspections and associated administrative costs to recover from the applicant or developer (Wein 2000). Each federal agency has different types of actions to assess. In some cases, construction and development are not the only types of actions that an agency conducts. In cases where construction does occur, it would be beneficial to combine the efforts of the building department's (or the equivalent) inspections with the planning department's mitigation monitoring. In non-construction type actions it is important to delegate joint monitoring efforts to agencies that play a regulatory role in the particular types of actions taking place.

(3) Database of mitigation measures

The effectiveness of mitigation measures is a concern to CEQA stakeholders and state agencies. CEQA lacks data on the implementation costs and the short- and long-term effectiveness of mitigation commitments. Wein found that agencies consider determination of mitigation measures for specific impacts difficult due to the level of expertise required for such identification. Although CEQA requires agencies to monitor implemented mitigation measures, there is no requirement for agencies to assess the effectiveness of the measures.

Wein proposes that the CEQA legislation be amended to include language from Senate Bill (SB) 715, which was initially passed by the state legislature in 1997 but vetoed by California's Governor Wilson. Essentially the legislation would require the California Resources Agency Office of the Secretary to "report on the types and effectiveness of a representative sample of mitigation measures adopted by the state

and local agencies" (Wein 2000 p168). This information would be helpful to decision-makers to determine effective and consistent mitigation measures.

In light of improving NEPA, a mitigation database would serve as a beneficial information source. However, rather than delegate the responsibility to one central office to maintain the database, it is suggested that each federal agency would maintain a database of mitigation measures to illustrate the effectiveness of their application. The CEQ web page could provide a centralized portal to each agency's database.

(4) Role of responsible agencies in mitigation monitoring

Lead agencies recognize that the role of mitigation monitoring may be better placed with third-party responsible agencies. A responsible agency is "a public agency, other than the lead agency, which has responsibility for carrying out or approving a project" (CEQA §21069). The lead agency's level of expertise concerning environmental resources may lead to inadequate monitoring efforts.

Therefore, Wein proposes that CEQA legislation include clarification that the lead agency may rely on the responsible agency for mitigation monitoring. In the mitigation monitoring program, the lead agency would: distinguish the role of the responsible agency; determine with the lead agency the cost of administering the monitoring program; and collect this money from the proponent in order to reimburse the responsible agency for mitigation monitoring.

In the case of NEPA, language clarifying the role of the responsible agency would serve as a means to alleviate issues related to training for mitigation monitoring. Federal agencies that manage natural resources have personnel more qualified in monitoring natural resources than agencies whose core mission does not involve natural resource management. Mitigation monitoring by a responsible agency that already

deals with the environmental aspects being monitored provide more substantive observations than agencies with a non-environmental focus.

(5) Negotiate with applicants regarding mitigation measures

CEQA requires that lead agencies meet with the project proponent to negotiate mitigation measures. This assists with the development of CEQA documents by diminishing potential significant impacts and thereby eliminating the need for the preparation of CEQA's EIS equivalent, the Environmental Impact Report. This CEQA requirement is intended to streamline the process by permitting the proponent to adjust the project plans to preclude potential significant effects before the CEQA document is released for public review.

Wein found that most agencies did not comply with this CEQA requirement because they did not negotiate mitigation measures with the proponent (Wein 2000). Since causes of this noncompliance were not determined, Wein's survey recommends that the California Office of Planning and Research conduct a survey to clarify the level of compliance with this CEQA requirement and to determine necessary legislative remedies and/or changes to the CEQA guidelines to assure that negotiations between the lead agencies and proponents take place. As with CEQA, a survey would better *determine the need for explicit NEPA regulatory language on the subject of mitigation negotiation.*

Summary of Recommendations for improving NEPA

NEPA is in need of meeting its substantive goals. NEPA guidance meets the basic procedural requirements of the act but does not instill an order for goals nor does it explicitly define the role of the planner. These ambiguities decrease the effectiveness of

NEPA to meet its substantive goals. However, as evidenced in precedent-setting examples, substantive goals can be met through procedural requirements.

The two recommendations to improve the determination and enforcement of mitigation measures were generated from a lack of mitigation effectiveness. The examples provided by the CWA Section 404 MOA and CEQA's AB3180 indicate that effective mitigation involves explicit mitigation requirements.

The MOA signed between the Corps and EPA developed from the realization that wetlands would disappear if there were no explicit mitigation to prevent their decline. The MOA guidance offers a sequencing method to determine mitigation measures that places priority on avoiding the action. The sequencing method instills an approach for proactive planning with a sense of ethical rationality and offers NEPA a technique for establishing a basic order for goals that may lead to reaching optimal decisions.

As evidenced in the CEQA case, mitigation measures determined in the planning stages of projects tend to be neglected if verification is not required. CEQA's AB3180 obligates agencies to create a monitoring or reporting program for mitigation measures determined in the CEQA process. The passage of AB3180 gave leverage to the California state agencies' planning departments to ensure that mitigation measures are implemented. As suggested by Wein (2000) an effective monitoring or reporting program requires a mechanism to halt projects if mitigation promises are not met; explicit authority for recovering mitigation costs; able negotiation with proponents, and utilization of the support of other agencies and departments for mitigation monitoring (Wein 2000).

Most funding for government agency environmental divisions is funneled to the regulatory-based programs with less money for funding environmental planning (Rubenson et al. 1992). Cost recovery for mitigation monitoring provides the means for a successful monitoring program while at the same time prompting the proponent to minimize mitigation measures by reducing environmental impacts and their costs.

Negotiations between planners and proponents better defines the roles of both. Negotiation places greater emphasis on the needs of the proponent and the requirements of the agency when compared to the planner alone facilitating both the proponent's needs and the agency's requirements. Negotiations must also include a mechanism for planners to halt projects if mitigation promises are not met.

The support of other agencies and departments not only provides specialized expertise for mitigation monitoring but it also offers 3rd party verification of mitigation possibilities. Agencies or departments with a regulatory role may already inspect aspects of the action and could assist with joint monitoring.

The Section 404 MOA and AB3180 present NEPA with models for development and accomplishment of mitigation promises made during environmental planning. The obstacles and benefits encountered during the implementation of the Section 404 MOA and AB3180 provide the tools to strengthen the value and rationale of mitigation measures under NEPA. These precedents provide the means to more closely unite NEPA's procedural requirements and substantive goals.

Chapter Three. Cumulative Effects and Mitigation

The Louisville-Southern Indiana Ohio River Bridges (ORB) Project was chosen as a case study based on a feature article in *Environmental Practice*, the Journal of the National Association of Environmental Professionals. The focus of the article is the presentation of a methodology, adapted from CEQ guidance, to assess indirect and cumulative effects specific to the Ohio River Bridges Project. The consequences of indirect impacts and cumulative effects of a particular action or a collection of multiple actions over time can lead to destructive environmental effects.

In their environmental analyses, federal agencies routinely address the direct and (to a lesser extent) indirect effects of the proposed action on the environment. Analyzing cumulative effects is more challenging, primarily because of the difficulty of defining the geographic (spatial) and time (temporal) boundaries (CEQ 1997b).

Indirect impacts and cumulative effects are a challenge to the implementation of mitigation measures under NEPA.

One of the outcomes of the indirect and cumulative effects analysis (ICEA) found that mitigation measures designed to address these effects might result in non-implementation due to jurisdictional issues. An interview with Ron Deverman, the author of the feature article in *Environmental Practice* and a consultant to the ORB project, provided an overview of recent trends for indirect and cumulative effects mitigation.

The Ohio River Bridges Project⁹

The Ohio River Bridges (ORB) project arose out of the need for improved transportation in the Louisville Metropolitan Area (LMA), between Jefferson County, Kentucky and Clark County, Indiana. The current transportation system between the two counties is inefficient leading to traffic congestion and traffic safety problems. Forecasts indicate population and employment growth in the LMA, which potentially

⁹ For more information on the Ohio River Bridges Project refer to <http://www.kyinbridges.com/>.

exacerbate the traffic situation. The Indiana and Kentucky state departments of transportation mandated a solution to current and forecasted transportation problems.

The Ohio River intersects the two counties, requiring cross-river mobility (see figure 2). Currently, three bridges provide roadway access and two bridges provide

railway access in the LMA.

The roadway bridges include (1) the John F. Kennedy Memorial Bridge, (2) the George Rogers Clark Memorial Bridge and (3) the Sherman Minton Bridge. All three are located in densely populated urban areas and are close to different types of land uses. At the foot of the Kennedy Bridge is the Kennedy Interchange, where

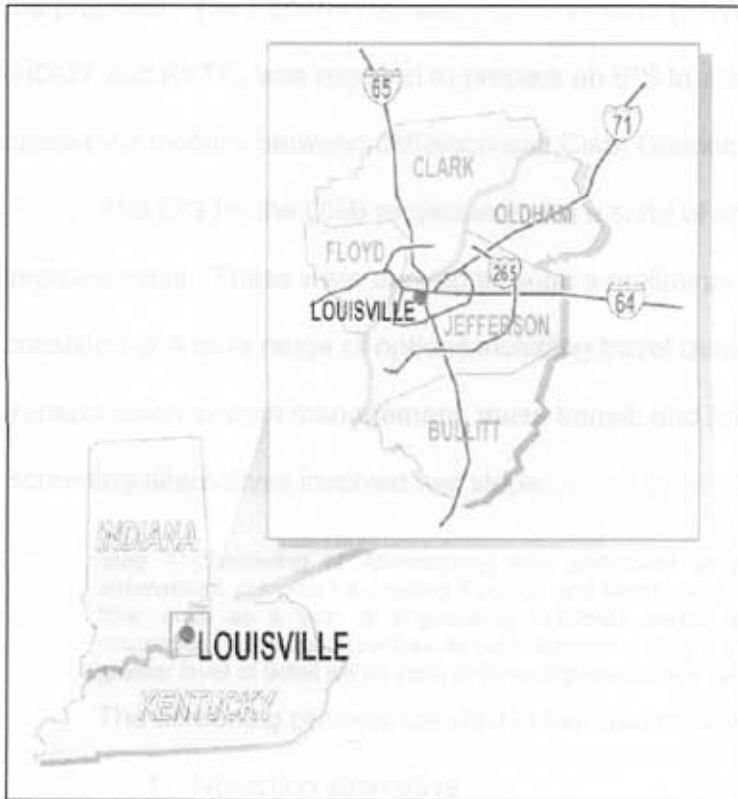


Figure 2. Louisville Metropolitan Area.
Image from the Federal Highway Administration (2003a)

three major highways converge. The nearest Ohio River crossings occur 30 miles downstream and 40 miles upstream.

Since 1969, every long-range transportation plan for the LMA has proposed one or two bridges over the Ohio River. In the early 1990's the Indiana Department of Transportation (INDOT) and the Kentucky Transportation Cabinet (KYTC) initiated the Metropolitan Louisville Ohio River Bridge Study to examine the need for a new bridge and to assess possible corridors for construction of the bridge. The study resulted with the finding that improvements are necessary based on projected population growth and transportation demands. The study recommended further evaluation of three possible

corridors for bridge construction. Two major studies ensued, the Ohio River Major Investment Study and the Horizon Year 2020 Regional Mobility Plan, which reaffirmed the finding that improved cross-river mobility is needed.

Based on these findings the INDOT and KYTC decided to continue the pursuit of the proposal. The Federal Highway Administration (FHWA), with assistance from the INDOT and KYTC, was required to prepare an EIS to assess alternatives for improving cross-river mobility between Jefferson and Clark Counties.

The EIS for the ORB project includes a suite of alternatives for transportation improvements. These were derived through a preliminary screening process and consisted of a wide range of options including travel demand management, transportation system management, mass transit, and bridge/highway options. Screening alternatives involved two steps.

Step 1 (Screening of Alternatives) was performed at a conceptual level to evaluate each alternative's potential for meeting Purpose and Need and to determine if any alternative had a fatal flaw, such as a lack of engineering feasibility and/or impacts or costs of an extraordinary magnitude, that would foreclose its consideration... Step 2 (Alignments) was performed at a slightly greater level of detail within each of three highway/bridge corridors...(Fed Hwy Admin 2003b p 3-4)

The screening process resulted in four alternatives for EIS analysis:

1. No-action alternative
2. Transportation management alternative
3. One bridge/highway alternative
4. Two bridge/highway alternative

The no-action alternative includes projects identified in the most recent Regional Mobility Plan, excluding renovation of the Kennedy Interchange and new bridges over the Ohio River. The Regional Mobility Plan is financially constrained but includes improvements to ten major highways, the mass transit system, and travel management programs. Evaluation of the no-action alternative is required in the NEPA process to serve as a baseline for comparison to the other alternatives.

The transportation management alternative includes a combination of travel demand management (TDM), transportation system management (TSM) and mass

transit improvements. TDM consists of programs or policies to reduce vehicles on the highway or to shift trips to non-commute times. TSM consists of inexpensive ways to control traffic by increasing travel efficiency. Mass transit improvements include enhanced bus service. The transportation management alternative was considered as a stand-alone alternative and was also incorporated into both bridge/highway alternatives.

Both the one bridge/highway and the two bridge/highway alternatives include construction of one or two bridges (respectively) across the Ohio River with associated highway approaches, the reconstruction of the Kennedy Interchange, and parts of the transportation management alternative. The bridge alternatives involve the identification of river crossing corridors and the identification of alignment alternatives. Traffic projections identify three corridors that would reduce vehicle hours traveled and vehicle miles traveled, meeting the purpose and need of the proposal. Once these corridors were identified, alignment alternatives were developed for each of the three corridor sites. These alignment alternatives were refined through an iterative evaluation process, including heavy public involvement. Nine possible one bridge/highway alternatives and six two bridge/highway alternatives were evaluated in the final EIS¹⁰.

Based on the results of the evaluation, the FHWA determined that the two bridge/highway alternative "is the only feasible and prudent alternative that will sufficiently address the Purpose and Need for action while balancing important environmental, community, and economic values" (FHWA 2003b p1). The evaluation of potential impacts includes consideration of environmental, social, and economic factors. As required under NEPA, direct, indirect, and cumulative impacts were analyzed.

¹⁰ It is beyond the scope of this thesis to address the details of the alternatives and the evaluation process used to select an alternative. However, it is noted that the ORB project is a noble national case study for effective NEPA implementation. It serves as an excellent example of effective coordination between local and state agencies, strong public involvement, and NEPA integration in the early stages of the planning process.

Direct impacts are commonly caused by the construction and/or operation of the proposed action and occur at the same time and place of the action. Indirect impacts often occur later in time or are farther removed in distance, but are reasonably foreseeable (40 CFR §1508.8(b)). Cumulative impacts are the effects on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions¹¹. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR §1508.7).

Indirect and Cumulative Effects Analysis

The ICEA for the ORB project is an assessment methodology developed and refined during a series of meetings with stakeholders, agencies, and jurisdictions. The eleven-step CEQ process was refined into a seven-step analysis for the ORB project (Deverman 2003). The seven steps include:

1. Identify resources affected
2. Identify spatial boundaries
3. Identify temporal boundaries
4. Identify other major actions affecting resources
5. Characterize resources and establish baseline conditions/trends
6. Determine impacts and environmental consequences
7. Address mitigation/monitoring opportunities and document results

The resources affected by direct, indirect, and cumulative effects were grouped into three categories: (1) land use/community resources, (2) historic and cultural resources, and (3) ecological resources. The spatial boundary for the ORB project was defined through an iterative process based on the three categories above. The land use/community resources category helped identify spatial boundaries with regard to

¹¹ The terms 'effect' and 'impact' are synonymous in the CEQ regulations (40 CFR §1508.8) and are treated as such in this thesis.

other major actions affecting the resources. Historic and cultural resources established the spatial boundary based on the Section 106 process of the National Historic Preservation Act. The establishment of spatial boundaries for ecological resources depends on the scale of analysis. In the case of the ORB project watershed boundaries were selected as the spatial limits for the ecological resources category.

Temporal boundaries were identified based on activities of the past, present and reasonably foreseeable future. Past activities were based on available information, including historical photographs and information on important events that helped form the region. Activities in progress provided the information for present activities. The activities of the foreseeable future were based on population, employment, and transportation forecasts out to 2025.

Other major actions affecting resources were identified through coordination with planners, engineers, and public officials of the region. These actions include projects involving economic development, parks/recreation development, water or energy-related development, and transportation infrastructure likely to occur in the reasonably foreseeable future. This information established the baseline conditions.

Cause-and-effect relationships for land use, historic resources, and ecological resources were outlined to determine likely trends. These relationships helped determine impacts and environmental consequences of the ORB project. A combination of literature review, site analysis, case study analysis, and expert panel workshops helped identify indirect and cumulative effects for the trend analysis. Mitigation and monitoring opportunities for direct and some indirect effects were presented in the final EIS. However, jurisdictional issues complicated cumulative effects mitigation.

Although federal agencies are required by NEPA "to analyze and document any identified cumulative effects . . . they [are] not necessarily required to mitigate those identified cumulative effects" (Deverman 2003 p 342). Enormous coordination between

agencies on all potential effects revealed that cumulative effects crossed regional and local jurisdictional boundaries and would be difficult to mitigate.

Cumulative Effects and Mitigation

The alternatives and mitigation measures the lead agency analyzes are not limited to those within its jurisdiction (40 CFR §1502.14(c)). For mitigation measures identified outside the lead agency's jurisdiction, the probability of implementation must be addressed by the lead agency (CEQ 1981 question 19b). It is outside the lead agency's authority to require another agency to implement mitigation measures.

The ORB project demonstrates that mitigation measures for cumulative effects tend to include multiple jurisdictions. As required by NEPA, agencies must give a "hard look" to all environmental effects, including cumulative effects as part of NEPA disclosure. Even when cumulative effects are identified and mitigation measures are defined to address them, jurisdictional issues tend to impede the accomplishment of these measures. Implementation of strong mitigation measures to target cumulative effects is difficult to attain (Deverman 2004). Conversely, mitigation measures for direct impacts are more straightforward, typically driven by pre-existing requirements.

The dilemma of jurisdictional issues inherent to cumulative effects mitigation parallels the situation encountered in Congress during NEPA's formative phase. Jurisdictional issues and piecemeal planning had impeded the early stages of NEPA formation. However, by the late 1960's general concerns over ecological issues had quelled the initial jurisdictional concerns. Only time will tell if ecological concern will trump jurisdictional issues for mitigation of cumulative effects.

Over the past two decades there has been an improvement in the coordination between lead agencies and regulatory and resource agencies (Deverman 2004). About 20 years ago agencies were doing the minimum possible for addressing mitigation

measures for direct impacts under NEPA. Currently, lead agencies are going beyond pre-existing requirements to address mitigation measures of direct impacts (Deverman 2004). A general increase of environmental stewardship within lead agencies is occurring. For example, a current national trend shows that lead agencies mitigate significant impacts by purchasing property for conservation purposes (Deverman 2004).

Although mitigation measures for indirect and cumulative effects are difficult to determine and enforce they are not ignored by the lead agency. The state transportation agencies, the FHWA, and the local/regional jurisdictions coordinated effectively and put together an excellent mitigation strategy (Deverman 2004). Mitigation measures for the indirect and cumulative effects identified in the ORB project were addressed through project enhancements. For example, the INDOT lead agency of the ORB project, is funding a grant for Clark County to revise their comprehensive plan, develop strategies for funding on-going planning and zoning functions, and develop strategies for smart growth in the areas affected by bridge construction.

In fact, another recent national trend to address cumulative effects includes creating and funding a certified planner position at the local and regional levels (Deverman 2004). Local and regional agencies are usually understaffed and do not have enough resources to deal with mitigation of cumulative effects (Wein 2000 and Deverman 2004). The new staff member provides an opportunity at the local and regional level to coordinate land use and zoning issues.

Case Study Analysis

The NEPA process and analysis conducted for the ORB project is an innovative and substantive application of the NEPA procedure. Public involvement was inclusive and far-reaching. Public meetings held in the fall of 1999 and spring of 2000 drew more than 1,000 people each. Five thousand public comments were received on the draft

EIS. The resulting EIS and associated documents thoroughly and clearly describe the proposal, alternatives, and environmental impacts associated with each. Documents include mitigation measures developed primarily by cumulative effects analysis, which are above and beyond measures derived from preexisting requirements.

Although cumulative effects analysis is a required part of the NEPA process, it tends to be underutilized or misused. McCold & Holman (1995) show that only 2% of 89 EA's prepared by 13 federal agencies identified all past, present, and reasonably foreseeable future actions as part of their cumulative effects analysis. This problem may be remedied by identifying past, present, and future actions early in the NEPA analysis (McCold & Holman 1995).

Deverman (2003) proves this remedy effective for NEPA analysis conducted on the ORB project, the success of which also depended on the ICEA. Deverman compares the ICEA methodology for the ORB project to the laws of the harvest, which include the following principles: (1) be prepared and start early; (2) take time to make it bountiful; (3) harvest more than you sow; and (4) continue the life cycle (Deverman 2003). Cumulative effects analysis provides a means to overcome the rut of basing mitigation measures on preexisting requirements.

However, this case study makes it clear that jurisdictional issues may hinder mitigation for cumulative effects. Deverman (2003) states that local and regional government levels tend to be the focal point for carrying out mitigation for cumulative effects. Mitigation implementation and monitoring is a heavy burden on local and regional government agencies because it is time consuming and costly (Wein 2000).

At the time that the article "Gathering the Harvest: Assessing Indirect and Cumulative Effects for the Ohio River Bridges Project" (Deverman 2003) was written, the ROD and final mitigation strategy for the ORB project had not been completed. By the time Ron Deverman was interviewed for this thesis, the ROD, which includes the

mitigation strategy, had been signed. Some of the mitigation measures identified in the ROD reveal the positive influence that cumulative effects analysis has had.

During the interview it was argued that the sequencing methodology for determining mitigation measures does not need to be made explicit since it is already a part of the environmental professional's thought process (Deverman 2004). However, some NEPA practitioners in government agencies may not have the environmental education and expertise that the qualified environmental professional does. The sequencing method serves as an explicit reminder of the implicit precautionary approach typical of environmental professionals.

The interview revealed that the monitoring and reporting of mitigation measures is perceived as a constructive addition to the NEPA procedure (Deverman 2004). Monitoring for mitigation of cumulative effects may be unwieldy since effective metrics are not absolute. However, this does not diminish the need for mitigation monitoring and reporting in the NEPA process.

Chapter Four. Discussion of Recommendations for NEPA

NEPA provides information about proposed actions and their forecasted environmental effects. This allows for informed decision-making and provides a venue for public involvement. NEPA requires agencies to take a "hard look" at the environmental effects of proposals, thereby providing a means to account for the environment during the planning process.

However, environmental protection under NEPA is cut short by a lack of ordered goals. NEPA's procedural requirements do not meet the intended policy goals of the Act. The rationality of NEPA is typically subject to economic forces that overwhelm priorities for environmental protection. Nonetheless, NEPA has the potential to provide a more solid backbone for environmental accounting by strengthening its procedural requirements.

There must be a mechanism to hold agencies not only to the letter of the law but also the spirit to which it was written. NEPA's cookie cutter approach to mitigation determination is based on pre-existing requirements and mitigation measures committed to in NEPA have no recourse for their realization. Pre-existing requirements shouldn't be the only means to account for environmental impacts because impacts are continuous and dynamic while requirements are discrete and fixed.

In order to approach NEPA's substantive purpose an order for mitigation goals should be part of every agency's NEPA procedure. The CWA's section 404 permit MOA provides the model for an incremental method that prioritizes importance to lessening environmental impacts for the determination of mitigation measures.

There is no strongly enforced feedback mechanism to check on the implementation and quality of mitigation measures once they have been committed to under NEPA. As evidenced in CEQA's AB3180, mitigation monitoring needs to be an

explicit procedural requirement to actually work. The NEPA process should be amended to require mitigation monitoring or reporting as modeled by CEQA.

NEPA is an important law for it compels agencies to consider the environment and it allows for public review during the decision making process. However, NEPA needs to change to stay current with the dynamic environment it was created to protect. Reinvigorating NEPA's procedure as recommended in this thesis, and summarized on pages 40-41, would move the public and federal agencies a step closer to meeting NEPA's substance.

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