# Taking a Harder Look at Direct, Indirect, and Cumulative Impacts*

by Murray D. Feldman

Holland & Hart LLP,
Boise, Idaho

*This paper was presented at the Rocky Mountain Mineral Law Foundation special institute entitled "National Environmental Policy Act" and appeared in the institute manual as Paper 4 (Rocky Mt Min L Fdn 2010).*

## I. Introduction

The National Environmental Policy Act (NEPA) directs federal agencies to identify, consider, and disclose the environmental impacts of, and alternatives to, major federal actions significantly affecting the quality of the human environment.[1] NEPA further requires those agencies to take a "hard look" at the environmental consequences of their proposed actions and to provide a reasonably thorough discussion of the significant aspects of the probable environmental consequences in environmental assessments or environmental impact statements.[2] An adequate understanding of environmental impacts often demands the analysis of available scientific information, collection and analysis of additional data, or the use or application of models or other predictive technologies (such as groundwater hydrology, streamflow, sediment yield, noise propagation,

---

* This article originally was prepared for and appeared under the same title in the Rocky Mountain Mineral Law Foundation's Special Institute on the *National Environmental Policy Act* 4-1 (Rocky Mtn. Min. L. Found. 2010). Part Two is a revised and edited version of the article by Murray D. Feldman, Michael J. Brennan, and Hadassah M. Reimer entitled "Of Hard Looks, Reason, and Agency Expertise: Shifting Standards for Implementing NEPA's Scientific Analysis Requirements," published at 53 *Rocky Mtn. Min. L. Inst.* 8-1 (2007). Acknowledgment is made to the Foundation for the republication of portions of that article here, and also to my coauthors Mike Brennan and Dessa Reimer for their research, efforts, and contributions to the original RMMLI article. I also gratefully acknowledge the research of my colleagues Craig Galli, Jennifer Hill, Dessa Reimer, and others that is reflected in the discussions in Part One of this article.

[1] 42 U.S.C. § 4332(2)(C).

[2] *E.g.,* Nat'l Parks & Conservation Ass'n v. Babbitt, 241 F.3d 722, 730 (9th Cir. 2001), *abrogated in part on other grounds by* Monsanto Co. v. Geertson Seed Farms, 130 S. Ct. 2743, 2757 (2010); Ctr. for Biological Diversity v. U.S. Forest Serv., 349 F.3d 1157, 1166 (9th Cir. 2003).

and wildlife population and habitat analyses) to describe likely environmental effects.[3]

This paper consists of two parts. Part One describes the basic Council on Environmental Quality (CEQ) requirements for analyzing, evaluating, and disclosing the environmental consequences of proposed federal actions—i.e., the environmental impacts—in a NEPA document, i.e. an environmental impact statement (EIS) or environmental assessment (EA).[4] Part One addresses the basic CEQ requirements for evaluating direct, indirect, and cumulative effects and ascertaining the possible significance of these effects. Part One also addresses several practical "as applied" issues that arise in the impact assessment methodology.

Part Two turns to the standard of review applied by the federal courts in reviewing challenges to the impact assessment analyses and disclosure of impacts contained in NEPA document. Part Two explains that in recent years—since at least 1998 if not earlier—the federal courts have begun to dig even deeper and review more closely whether agencies have met the CEQ requirements for impact analyses and disclosures, resulting in the current framework of "harder-look" judicial review, the history of which is traced and the current status explored further in Part Two.

## PART ONE

## II. Statutory and Regulatory Framework

### A. NEPA's Twin Goals

NEPA's twin goals are: (1) to foster informed decisionmaking by "ensur[ing] that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts," and (2) to promote informed public participation by requiring full disclosure of and opportunities for the public to participate in governmental decisions affecting environmental quality.[5] To that end, agencies must disclose the scientific information and analyses on which they rely in their environmental effects analyses and decisionmaking processes.

### B. NEPA's Action-Forcing Provisions

NEPA requires the preparation of an EIS for every "major Federal action significantly affecting the quality of the human environment."[6] An

---

[3] *See, e.g.*, Carla Mattix & Kathleen Becker, "Scientific Uncertainty Under the National Environmental Policy Act," 54 *Admin. L. Rev.* 1125 (2002).

[4] *See* 40 C.F.R. § 1502.16.

[5] Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 349-50 (1989). *See also* 40 C.F.R. § 1500.1(b), (c).

[6] 42 U.S.C. § 4332(2).

EIS, among other things, details "the environmental impact of the proposed action," "any adverse environmental effects which cannot be avoided should the proposal be implemented," and "alternatives to the proposed action."[7] An agency may first prepare an EA to aid in its implementation of NEPA and to determine whether the effects of the action will be significant, requiring analysis in an EIS.[8] If the EA concludes with a finding of no significant impact (FONSI), then preparation of an EIS is not required.[9] But the EA's FONSI determination must still be supported by the agency's record and any applicable scientific information and analysis. While NEPA does not require a particular substantive outcome, it does "mandate[] that the agency gather, study, and disseminate information concerning the project['s] environmental consequences."[10]

### C. NEPA's Scientific Information and Data Requirements

NEPA requires agencies to "[u]tilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment."[11] "In the language of the caselaw, NEPA thus broadly requires that the [agency] take a 'hard look' at the environmental consequences of its actions."[12]

The CEQ's NEPA regulations, binding on all federal agencies,[13] provide standards for an EIS's information requirements and preparation.[14] An EIS must clearly present information and analysis of the environmental consequences that form the scientific and analytic basis for consideration of reasonable alternatives.[15] In preparing an EIS, agencies must "insure the professional . . . and scientific integrity, of the discussions and analyses in environmental impact statements."[16] In so doing, they must identify the methodologies used, and must explicitly refer to the scientific and other sources of information relied upon for conclusions set forth in the EIS. The information included in an EIS "must be of a high quality," and must allow for "accurate scientific analysis, expert agency comments, and public

---

[7] 42 U.S.C. § 4332(2)(C)(i)-(iii).

[8] 40 C.F.R. §§ 1501.4, 1508.9.

[9] *Id.* § 1508.13.

[10] Sabine River Auth. v. Dep't of the Interior, 951 F.2d 669, 676 (5th Cir. 1992).

[11] 42 U.S.C. § 4332(2)(A).

[12] Sierra Club v. Marita, 46 F.3d 606, 616 (7th Cir. 1995) (citing *Methow Valley*, 490 U.S. at 350).

[13] ONRC Action v. Bureau of Land Mgmt., 150 F.3d 1132, 1138 n.3 (9th Cir. 1998).

[14] 40 C.F.R. pt. 1500.

[15] *Id*. §§ 1502.14, 1502.16.

[16] *Id*.

scrutiny."[17] An EIS must identify any methodologies used and reference the scientific sources relied upon.[18] The agency must also discuss responsible opposing views.[19] At the same time, EISs should not be encyclopedic, but rather "concise, clear, and to the point, and . . . supported by evidence that agencies have made the necessary environmental analyses."[20] Impacts should be discussed in proportion to their significance, and "data and analyses in a statement shall be commensurate with the importance of the impact" of the proposed action or its alternatives.[21]

When information "relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives," the CEQ regulations require that the agency either: (1) determine that the cost of obtaining such information is "exorbitant or the means to obtain it are not known," or (2) obtain the information and include it in the EIS.[22] NEPA's purpose, however, is not "the accumulation of extraneous background data."[23] If obtaining the information is too costly or infeasible, the agency can forego its collection, in which case the agency must include in the EIS: (1) A statement that the information is incomplete or unavailable; (2) a statement of the relevance of the incomplete or unavailable information; (3) a summary of relevant "existing credible scientific evidence;" and (4) the agency's evaluation of impacts based on "theoretical approaches or research methods generally accepted in the scientific community."[24] The underlying purpose of the CEQ regulations is to ensure that agencies, to the greatest extent possible, have access to and include in environmental analyses all available information necessary to assess impacts and make a reasoned choice between alternatives.[25]

Overall, NEPA, its implementing regulations, and agency guidance all recognize that an effective impact analysis and an agency's choice among reasonable alternatives must be based on the review of relevant high-quality data and other information.

---

[17] *Id.* § 1500.1(b).

[18] *Id.* § 1502.24.

[19] *Id.* § 1502.9(b).

[20] *Id.* §§ 1500.2(b), 1502.1.

[21] *Id.* §§ 1502.15, 1502.2.

[22] *Id*. § 1502.22.

[23] *Id*. § 1500.2(b).

[24] *Id*. § 1502.22(b).

[25] *See id.* §§ 1500.1, 1502.14.

## III. Evaluation of Environmental Effects

NEPA requires that an agency discuss the environmental effects of a proposed action in an EA or an EIS.[26] NEPA's implementing regulations define environmental effects to include both the direct and indirect effects of a proposed action, as well as cumulative effects. "Direct effects" of a proposed action are those "that are caused by the action and occur at the same time and place."[27] "Indirect effects" are defined as those that are:

> caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.[28]

The CEQ regulations go on to explain that "effects" include ecological, aesthetic, historic, cultural, economic, social, or health effects, whether those effects are direct, indirect, or cumulative.[29]

### A. Direct and Indirect Effects

The Supreme Court has indicated that the scope of an agency's authority may also play a role in determining whether indirect effects must be considered under NEPA. In *U.S. Department of Transportation. v. Public Citizen*,[30] the DOT prepared an EA on proposed new safety regulations for Mexican motor carriers crossing the U.S.-Mexico border. DOT issued a FONSI. While the agency did consider effects on traffic, safety, and air emissions due to an increase in the number of roadside inspections, DOT did not consider the environmental impact of an increased number of Mexican trucks on U.S. highways in the EA.

Plaintiffs argued that rescission of the moratorium and the attendant entry of Mexican trucks was a "reasonably foreseeable" indirect effect of the issuance of the regulations and thus required consideration by the agency. However, DOT had concluded that because any change in trade volume or increase in the presence of Mexican trucks on U.S. highways would be a result of the President's lifting of the moratorium, and not of the agency's issuance of regulations, it need not consider those impacts. The Supreme Court agreed, stating that "a 'but for' causal relationship is

---

[26] 42 U.S.C. § 4332(2)(C); *see also* 40 C.F.R. § 1502.16; NRDC v. U.S. Forest Serv., 421 F.3d 797, 811 (9th Cir. 2005).

[27] 40 C.F.R. § 1508.8(a).

[28] *Id.* §1508.8(b).

[29] *Id.; see* Sierra Nev. Forest Prot. Campaign v. U.S. Forest Serv., 2006 WL 148966 (9th Cir. Jan. 19, 2006) (unpublished) (upholding EA's cumulative effects discussion).

[30] 541 U.S. 752, 124 S.Ct. 2204 (2004).

insufficient to make an agency responsible for a particular effect under NEPA."[31] Instead, a "reasonably close causal relationship," similar to proximate cause in tort law, is required.[32] Thus, the Court held that "where an agency has no ability to prevent a certain effect due to its limited statutory authority over relevant actions, the agency cannot be considered a legally relevant 'cause' of the effect." Hence, DOT was not required to "consider these effects in its EA when determining whether its action is a 'major Federal action.' "[33]

### B. Cumulative Effects

The CEQ regulations require the consideration of cumulative impacts in NEPA documents.[34] A cumulative impact "results 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 actions."[35] Cumulative impacts can arise from individually minor actions that are collectively significant over a period of time.[36] A meaningful cumulative impact analysis identifies: (1) the area in which the effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, present, proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate.[37]

A good illustration of the requirement to consider cumulative impacts is found in *Sierra Club v. Penfold*.[38] The district court concluded that individual gold placer mines—many of which were very small operations—had cumulative impacts on four different watersheds, and that

---

[31] 124 S. Ct. at 2215 (*citing* Metro. Edison Co., v. People Against Nuclear Energy, 460 U.S. 766 (1983)).

[32] 124 S. Ct. at 2215.

[33] *Id.* at 2217.

[34] 40 C.F.R. §§ 1508.25(c)(3), 1508.27(b)(7).

[35] 40 C.F.R. § 1508.7.

[36] *Id.* When two related projects are under environmental review by an agency, the agency may choose to analyze the cumulative impacts of the projects in one review, and it does not need to mimic the analysis in the other review. *See* San Francisco Baykeeper v. U.S. Army Corps of Eng'rs, 219 F. Supp. 2d 1001, 1016-17 (N.D. Cal. 2002).

[37] TOMAC v. Norton, 433 F.3d 852, 864 (D.C. Cir. 2006); La. Crawfish Producers Ass'n v. Rowan, 463 F.3d 352, 357-58 (5th Cir. 2006).

[38] Sierra Club v. Penfold, 664 F. Supp. 1299 (D. Alaska 1987), *aff'd*, 857 F.2d 1307 (9th Cir. 1988).

BLM had failed to analyze those impacts.[39] In the court's view, the cumulative impacts (principally increased sedimentation and degradation of water quality) were clearly significant in two of the watersheds. It therefore ordered BLM to prepare EISs on those impacts. For the other two watersheds, BLM had to prepare EAs to determine if EISs were necessary. (BLM subsequently prepared EISs for all four watersheds.) The court enjoined BLM from approving any mining operations in the watersheds until it completed adequate EISs and EAs. The Ninth Circuit affirmed.

Cumulative impact analysis has become a fertile ground for NEPA litigation.[40] It is now an integral component of the NEPA process.[41] Ninth Circuit case law has required that cumulative impacts analyses be included in EAs, as well as EISs.[42]

## IV. Reasonable Foreseeability and Climate Change Effects

An EIS or EA must consider the direct, indirect, and cumulative effects of the proposed action that are "reasonably foreseeable."[43] "Reasonably foreseeable" effects are those that are "sufficiently likely to occur that a person of ordinary prudence would take [them] into account in reaching a decision."[44] "Highly speculative" effects that "distort the decisionmaking process" by emphasizing consequences beyond those of "greatest concern to the public and of greatest relevance to the agency's decision" should not be discussed.[45] A "but for" causal relationship is "insufficient to make an agency responsible for a particular effect under NEPA."[46] "NEPA requires

---

[39] The court stated:

> [I]f ever there was a paradigm instance of "cumulative" or "synergistic" impacts, it is this case. Dozens of small operations of a single type incrementally contribute to deterioration of water quality in a common drainage stream. … While the operations are not functionally or economically interdependent, their impacts are interdependent and require common analysis.

*Penfold*, 664 F. Supp. at 1303-04.

[40] For examples of litigation concerning cumulative impact studies on mining operations, *see* Great Basin Mine Watch v. Hankins, 456 F.3d 955, 971-74 (9th Cir. 2006); N. Alaska Envtl. Ctr. v. Lujan, 961 F.2d 886 (9th Cir. 1992).

[41] The consideration of cumulative impacts must contain "some quantified or detailed information," and "general statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." *Great Basin*, 456 F.3d at 971.

[42] Kern v. Bureau of Land Mgmt., 284 F.3d 1062, 1075 (9th Cir. 2002); Native Ecosystems Council v. Dombeck, 304 F.3d 886, 895 (9th Cir. 2002) ("[a]n EA may be deficient if it fails to include a cumulative impact analysis").

[43] 42 U.S.C. § 4332(C)(ii); 40 C.F.R. §§ 1502.16(a) & (b), 1508.7, 1508.25(c).

[44] City of Shoreacres v. Waterworth, 420 F.3d 440, 453 (5th Cir. 2005).

[45] *Methow Valley*, 490 U.S. at 355-56.

[46] *Public Citizen*, 541 U.S. at 754.

a 'reasonably close causal relationship' akin to proximate cause in tort law."[47]

Recent attention also has focused on the extent to which NEPA analyses must incorporate discussion of global climate change.[48] Draft guidance from the Council on Environmental Quality indicates that climate change should be considered as part of the NEPA process, including: (1) the potential for federal actions to influence global climate change (e.g., increased emissions or sinks of greenhouse gases), and (2) the potential for global climatic change to affect federal actions (e.g., feasibility of coastal projects in light of projected sea level rise).[49] The courts have held that "the fact that 'climate change' is largely a global phenomenon that includes actions that are outside of the agency's control . . . does not release the agency from the duty of assessing the effects of its actions on global warming."[50] Failure to address climate change or to include an adequate analysis of the impacts of the proposed project on climate change may invalidate a NEPA document.[51]

## V. Context and Intensity of Effects – Determining Significance

Determining the potential significance of forecast effects is an important part of the NEPA evaluation. First, it may determine whether an EIS is required; second, it is relevant to describing the magnitude of the effects, regardless of whether in an EA or EIS. If it is unclear whether an EA or EIS is normally prepared for the action, the agency should prepare an EA, and based on the results of the EA, determine whether to prepare an EIS.[52] The agency may also decide to prepare an EIS without first preparing an EA if it believes the impacts will be significant.[53] "If an agency . . . opts not to prepare an EIS, it must put forth a convincing

---

[47] *Id.*

[48] For a detailed discussion of NEPA and climate change issues, *see* Murray D. Feldman, Sandra A. Snodgrass, Hadassah M. Reimer, "Consideration of Climate Change in NEPA and ESA Processes," 45(2) *Rocky Mtn. Min. L. J.* 325 (2008).

[49] *See* Draft Memorandum from Kathleen A. McGinty, CEQ Chairman, to Heads of Federal Agencies, Guidance Regarding Consideration of Global Climatic Change in Environmental Documents Prepared Pursuant to NEPA, at 5 (Oct. 1997).

[50] Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 538 F.3d 1172, 1217 (9th Cir. 2008).

[51] *Id.;* Border Power Plant Working Group v. Dep't of Energy, 467 F. Supp. 2d 1040 (S.D. Cal. 2006); Mid States Coalition for Progress v. Surface Transp. Bd., 345 F.3d 520 (8th Cir. 2003). *But see* In re Cedar Pot Thinning Sale, 122 I.B.L.A. 53 (1992) (holding contribution of proposed timber sale—release of carbon dioxide that would occur from timber harvest—to global warming was too small and too speculative to require analysis); In re Bar First Go Round Salvage Sale, 121 I.B.L.A. 347 (1991) (same).

[52] *See* 40 C.F.R. § 1501.4(b)-(c).

[53] *See id.* § 1501.3.

statement of reasons that explain[s] why the project will impact the environment no more than insignificantly."[54]

The CEQ Regulations require that an EA contain sufficient information and analysis to determine whether a proposed action is likely to have significant impacts, thus requiring preparation of an EIS.[55] The CEQ regulations provide some guidance in ascertaining whether a project will "significantly" affect the environment. In the context of a site-specific action, "significance would usually depend upon the effects in the locale rather than in the world as a whole."[56] Both short- and long-term effects are relevant to a determination of significance.[57]

Such a determination requires consideration of both the context and intensity of project effects.[58] "Intensity" refers to the severity of the impact. The CEQ Regulations list ten factors that should be considered in evaluating intensity.[59] The factors are:

> (1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.
>
> (2) The degree to which the proposed action affects public health or safety.
>
> (3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
>
> (4) The degree to which the effects on the quality of the human environment are likely to be controversial.
>
> (5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
>
> (6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
>
> (7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

---

[54] Ocean Advocates v. U.S. Army Corps of Eng'rs, 402 F.3d 846, 864 (9th Cir. 2005) (internal quotation marks omitted).

[55] *See* 40 C.F.R. § 1508.9.

[56] *Id.*

[57] *See id.*

[58] *See id.* § 1508.27.

[59] *Id.*

> (8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources.
>
> (9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
>
> (10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for protection of the environment.[60]

The Ninth Circuit has held that the presence of "one of these factors may be sufficient to require preparation of an EIS in appropriate circumstances."[61]

Despite these guidelines, however, "there is no hard and fast definition of 'significant effect,' " and the "courts have struggled to give it concrete meaning."[62] Courts and agencies alike have noted how vexing the threshold determination of significance can be.[63]

In *Western Land Exchange Project v. United States Bureau of Land Management* ("*WLXP*"),[64] the court held that BLM's decision not to prepare an EIS in connection with the privatization of 6,478 acres of land under the Lincoln County Lands Act was arbitrary and capricious. The court found that the record was "replete with references to concerns over water availability,"[65] and that there was considerable uncertainty regarding the possible effects of groundwater pumping on surface flows in the Virgin River.[66] Thus, plaintiffs had raised substantial questions regarding "highly uncertain" effects on Virgin River flows (factor 5) as well as impacts from the project on threatened and endangered species dependent on Virgin River flows (factor 9).[67]

---

[60] *Id.*

[61] *Ocean Advocates,* 402 F.3d at 865.

[62] Vieux Carre Property Owners, Inc. v. Pierce, 719 F.2d 1272, 1279 (5th Cir. 1983).

[63] *See* Public Citizen v. Nat'l Highway Traffic Safety Admin., 848 F.2d 256, 266 (D.C. Cir. 1988) ("Courts, no less than the agencies themselves, have found it trying to imbue this 'vague and amorphous term' with a consistent and coherent definition.") (citation omitted); Glacier-Two Medicine Alliance, 88 I.B.L.A. 133, 129 (1985) ("The volume of litigation over the past 15 years concerning the applicability of this requirement to a myriad of Federal actions establishes that the line separating significant impacts from insignificant ones is neither clear nor uniformly applied by the courts.")

[64] 315 F. Supp. 2d 1068 (D. Nev. 2004).

[65] *Id.* at 1079.

[66] *Id.* at 1094.

[67] *Id.* at 1094.

In *National Parks & Conservation Association v. Babbitt*, the Ninth Circuit held that the National Park Service's EA/FONSI for a plan to increase the number of cruise ships entering Glacier Bay in Alaska was inadequate.[68] Focusing on factors (4) (highly controversial effects) and (5) (highly uncertain effects), the court found that because the impacts of the plan were unknown, the plan was by definition highly controversial, and therefore warranted preparation of an EIS.[69] The court stated "the absence of currently available information does not excuse the [NPS] from preparing an EIS when there is a reasonable possibility that such information can be obtained in connection with the preparatory process."[70]

In *Idaho Sporting Congress v. Thomas*,[71] the court concluded that the Forest Service failed to take a hard look at the water quality impacts of a timber sale in the Targhee National Forest. When deciding to prepare an EA, instead of an EIS, the Forest Service relied on two reports by a Forest Service hydrologist. The court found that there were important factual differences between the areas and activities studied in the earlier report and the EA, and therefore the earlier report could not compensate for the lack of hard data in the second report, which relied solely on the Forest Service hydrologist's expert opinion. The court reasoned that "allowing the Forest Service to rely on expert opinion without hard data either vitiates a plaintiff's ability to challenge an agency action or results in the courts second guessing an agency's scientific conclusions."[72] Because the court found both of these alternatives unacceptable, it concluded that "NEPA requires that the public receive the underlying environmental data from which a Forest Service expert derived her opinion."[73] As a result of the Forest Service's failure to provide adequate data to the public, substantial questions remained as to the environmental effects of the timber sale, and the court "conclude[d] that an EIS [wa]s necessary to explore the substantial questions in respect to whether and what significant effects the sale may have."[74]

"[A]n EIS *must* be prepared if substantial questions are raised as to whether a project may cause significant degradation of some human environmental factor."[75] "To trigger this requirement a plaintiff need not

---

[68] 241 F.3d 722 (9th Cir. 2001).

[69] *Id.* at 737.

[70] *Id.*

[71] 137 F.3d 1146 (9th Cir. 1998), *overruled in part on other grounds by* Lands Council v. McNair, 537 F.3d 981, 997 (9th Cir. 2008) (en banc).

[72] *Id.* at 1150.

[73] *Id.*

[74] *Id.* at 1151.

[75] Wetlands Action Network v. U.S. Army Corps of Eng'rs, 222 F.3d 1105, 1119 (9th Cir. 2000) (original alterations omitted), *abrogated in part on other grounds by* Wilderness

show that significant effects will in fact occur, raising substantial questions whether a project may have a significant effect is sufficient."[76] However, the mere presence of negative effects from an agency action need not trigger the need for an EIS or demonstrate that the effects are "highly uncertain" or "highly controversial" so as to be significant under 40 C.F.R. § 1508.27.[77]

Courts have recognized that adequate mitigation measures can serve to transform otherwise significant project impacts into insignificant effects, thereby not requiring preparation of an EIS.[78] Importantly, such measures need not reduce environmental impacts to nonexistence, if they reduce those impacts to insignificance. "If significant measures are taken to mitigate the project's effects, they need not completely compensate for adverse environmental impacts."[79] Consistent with the requirement that proposed mitigation measures be developed to a reasonable degree, a plan to study the environmental impacts of a project in the future does not constitute adequate mitigation. An agency cannot "act first and study later."[80]

## VI. Cumulative Impact Studies

### A. Scope of Cumulative Impacts Analysis

#### 1. An Approach to Cumulative Impacts In General

A guidebook prepared by the CEQ[81] suggests strategies for undertaking a cumulative impacts analysis. Although the CEQ Guidebook is not formal agency guidance and is not binding on courts, courts have nonetheless looked to it when considering a variety of cumulative impacts issues.[82] According to the CEQ Guidebook, determining the scope of a

---

Soc'y v. U.S. Forest Serv., 630 F.3d 1173, 1178, 1180 (9th Cir. 2011) (en banc); *Idaho Sporting Congress,* 137 F.3d at 1149; Greenpeace Action Network v. Franklin, 14 F.3d 1324, 1332 (9th Cir. 1992); LaFlamme v. FERC, 852 F.2d 389, 397 (9th Cir. 1988).

[76] *Idaho Sporting Congress,* 137 F.3d at 1150 (alterations omitted).

[77] Native Ecosystems Council v. U.S. Forest Service, 428 F.3d 1233, 1240 (9th Cir. 2005).

[78] *See* C.A.R.E. Now, Inc. v. FAA, 844 F.2d 1569, 1575 (11th Cir. 1988) (upholding EA for runway extension project); Cabinet Mtns. Wilderness v. Peterson, 685 F.2d 678, 683 (D.C. Cir. 1982) (upholding EA for exploratory mineral drilling in grizzly bear habitat).

[79] *Wetlands Action Network*, 222 F.3d at 1121 (*citing* Friends of Payette v. Horseshoe Bend Hydro. Co., 988 F.2d 989 (9th Cir. 1993)).

[80] *National Parks*, 241 F.3d at 734.

[81] *Considering Cumulative Impacts Under the National Environmental Policy Act* (Jan. 1997) (the "CEQ Guidebook"). The CEQ Guidebook (available at http://ceq.eh.doe.gov/nepa/ccenepa/ccenepa.htm) notes that it is informational in nature and not formal CEQ guidance, nor does it have legally binding effect.

[82] *See Native Ecosystems,* 304 F.3d at 896 (CEQ Guidebook cited by Ninth Circuit for need to consider cumulative impacts in EAs); American Rivers v. FERC, 201 F.3d 1186, 1195

cumulative impacts analysis generally involves evaluation of (1) the resources that will likely be affected directly or indirectly (even if that effect may be minor) by the proposed action; (2) the geographic area where the project impacts are anticipated to accrue; and (3) the time frame in which the effects of the proposed project will occur.[83] Although not invoking the CEQ Guidebook explicitly, several courts have adopted a similar framework for considering cumulative impacts:

> [A] meaningful cumulative impact analysis must identify: (1) the area in which the effects of the proposed project will be felt; (2) the impacts that are expected in that area from the proposed project; (3) other actions—past, present, and proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area; (4) the impacts or expected impacts from these other actions; and (5) the overall impact that can be expected if the individual impacts are allowed to accumulate.[84]

### 2. Identifying Affected Resources

A key step in cumulative impacts analysis is determining which resources should be considered for potential cumulative effects. In the context of the site-specific analysis of a proposed project, CEQ's regulations require the consideration of ecological, aesthetic, historic, cultural, economic, social, and health effects.[85] BLM's NEPA Handbook more specifically lists those resources that must be considered in all EAs and EISs, which resources include air quality, areas of critical environmental concern, cultural resources, prime or unique farmlands, floodplains, Native American religious concerns, threatened or endangered species, hazardous and solid wastes, drinking and ground water quality, wetlands, wild and scenic rivers, and wilderness. The focus of the analysis should be on those resources that will be affected by the proposed action and if the resource is not present or will not be affected by the proposed action, the EA or EIS may make a negative declaration to that effect.

In the context of cumulative impacts analysis, the CEQ Guidebook provides that the same resources should be considered for potential cumulative impacts review as those considered during site-specific

---

n.15 (9th Cir. 1999) (CEQ Guidebook cited by Ninth Circuit for need to establish baseline conditions for environmental analysis); Habitat Educ. Ctr., Inc. v. Bosworth, 381 F. Supp. 2d 842, 849-50 (E.D. Wis. 2005) (CEQ Guidebook cited by district court when determining proper scope of cumulative impacts analysis for wildlife.).

[83] CEQ Guidebook, *supra* note 81, at 11.

[84] Fritiofson v. Alexander, 772 F.2d 1225, 1245 (5th Cir. 1985), *abrogated in part on other grounds by* Sabine River Auth. v. U.S. Dep't of Interior, 951 F.2d 669, 677 (9th Cir. 1992); *see also* Grand Canyon Trust v. FAA, 290 F.3d 339 (D.C. Cir. 2002).

[85] 40 C.F.R. § 1508.8(b).

analysis.[86] Nevertheless, "[n]ot all potential cumulative effects issues identified during scoping need to be included in an EA or an EIS . . . [if] irrelevant or inconsequential to decisions about the proposed action and alternatives."[87] The list of potentially affected resources cannot be limited to only those resources that will be significantly impacted by the proposed project. Even those resources that will experience minor effects should be considered if the impact, when considered with impacts caused by other past, present, and future actions, may prove to be significant.[88]

### 3. Geographic Scope of Cumulative Impacts Analysis

The proper scope of a cumulative impacts analysis is limited to those past, present and reasonably foreseeable future actions that involve effects on a resource value that will overlap with the proposed project's effects on that same resource value.[89] Determining the appropriate geographic limits of an EIS "requires a complicated analysis of several factors, such as the scope of the project considered, the features of the land, and the types of species in the area."[90] The CEQ Guidebook suggests that the appropriate scope should be defined by determining the largest geographic area that is occupied by the resources that could be affected by the proposed action.[91] Where an agency has previously evaluated or managed a resource over a geographic range other than that selected for a cumulative impacts analysis, the agency must justify its departure from its previous practice.[92]

---

[86] CEQ Guidebook, *supra* note 81, at 23.

[87] *Id*. at 12.

[88] Klamath-Siskiyou Wildlands Ctr. v. Bureau of Land Mngt., 387 F.3d 989, 994 (9th Cir. 2004) ("Sometimes the total impact from a set of actions may be greater than the sum of the parts.").

[89] 40 C.F.R. § 1508.7.

[90] Selkirk Conservation Alliance v. Forsgren, 336 F.3d 944, 958 (9th Cir. 2003).

[91] CEQ Guidebook, *supra* note 81, at 15; *see also id.* at 12 (noting that cumulative impact analysis "should be conducted on the scale of human communities, landscapes, watersheds, or airsheds"); *Kern,* 284 F.3d at 1078-79 (EA should consider reasonably foreseeable actions beyond project area, but within geographic range of affected timber species); *Habitat Educ. Ctr.*, 381 F. Supp. 2d at 850 ("The presence of species habitat outside the project area is also a relevant consideration in determining the geographic scope of a cumulative impacts analysis for wildlife.").

[92] *Native Ecosystems,* 304 F.3d at 897 (entire forest, rather than project area, was appropriate area over which to consider cumulative impacts of road density amendments, where Forest Service had previously chosen national forest as geographic area for which to promulgate binding road density standards in forest plan); Idaho Sporting Congress v. Rittenhouse, 305 F.3d 957, 974 (9th Cir. 2002) (Forest Service was arbitrary and capricious in using the "home range" of wildlife species as geographic area for cumulative impacts analysis where Forest Service's own scientists had concluded that habitat needs must be addressed at "landscape" level, and Forest Service failed to explain why it disregarded such information).

Once the appropriate geographic boundary for a cumulative impacts analysis has been defined, actions that occur outside of that area and whose impacts on a particular resource value do not overlap with the anticipated effects of the proposed action on that resource value need not be considered in that analysis. For example, in *Selkirk Conservation Alliance v. Forsgren*,[93] the Forest Service approved an access proposal to reach a national forest inholding after preparing an EIS. The plaintiffs challenged the decision, claiming that the EIS was inadequate because the Forest Service failed to consider the cumulative impacts of another access proposal in a neighboring forest. The Ninth Circuit upheld the Forest Service's decision not to consider the neighboring access proposal because the forests were separated by a ridgeline and located in separate watershed, viewshed, and endangered species management areas, and "[b]ecause of topography there would be no additional cumulative effects."

### 4. Temporal Limits on Cumulative Impacts Analysis

An agency engaged in cumulative impacts review must determine how far into the future it will analyze the cumulative effects of the project. In determining the appropriate temporal scope of cumulative impacts review, an agency is given deference if the agency provides a reasoned basis for choosing a particular time frame and the EA or EIS sets forth a "reasonably thorough discussion of the significant aspects of probable environmental consequences."[94] While the time frame in which the proposed action will take place may be the appropriate limit for cumulative impacts analysis, if the effects of the proposed action will persist, the agency may be required to extend the time frame for analysis.[95] For example, if the impacts of the project, though diminished, will continue for a number of years and the impacts of a future project when combined with the diminished impacts may increase the level of impacts beyond the significance threshold, the agency should extend the time frame for analysis to consider the impacts of the future project.[96]

When analyzing the cumulative impacts of a proposed project along with future actions, it is only necessary to consider those future actions that are reasonably foreseeable. "NEPA does not require the government to do

---

[93] 336 F.3d at 958; *see also* Inland Empire Public Lands Council v. U.S. Forest Serv., 88 F.3d 754, 758 (9th Cir. 1996) (upholding EIS where Forest Service extended analysis of endangered species impacts beyond project boundary, and plaintiffs failed to demonstrate that failure to extend analysis beyond the watershed to entire ecosystem was arbitrary and capricious).

[94] *Selkirk*, 336 F.3d at 962-63 (upholding Forest Service's decision to limit cumulative impacts analysis to three years given the fact that vital regulations upon which the analysis relied would be in place for only three years).

[95] CEQ Guidebook, *supra* note 81, at 16.

[96] *Id*.

the impractical" and an agency is not required to consider actions that are "remote" or "speculative."[97] At the same time, "[i]t is not appropriate to defer consideration of cumulative impacts to a future date when meaningful consideration can be given now."[98] A future action is not reasonably foreseeable merely because it is possible and may take place at some indeterminate point in the future.[99] Nor is a potential future action reasonably foreseeable if significant questions remain about its economic or practical feasibility. However, where an agency has taken concrete steps to evaluate or publicize a project, it will generally be a reasonably foreseeable action that must be included in the cumulative impacts analysis. For example, in *Western Land Exchange Project v. U.S. Bureau of Land Mgmt.*,[100] the court reasoned that if a nearby power plant project "was 'ripe' enough to deserve its own EIS, it was clearly 'ripe' enough to be analyzed as a reasonably foreseeable future project in other NEPA documents."[101]

### B. Adequacy of Cumulative Impacts Analysis

Determining which resources to consider and which actions to include in the cumulative impacts analysis does not end the agency's inquiry. The purpose of cumulative impacts review is to provide "useful analysis" so that significant cumulative effects can be minimized.[102] An agency must ensure that its cumulative impacts analysis is "more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects."[103] In considering cumulative impacts, an agency must provide "some quantified or detailed information; . . . [g]eneral statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided."[104] The EIS must provide enough information concerning other

---

[97] *See* Blue Mtns. Biodiversity Project v. Blackwood, 161 F.3d 1208, 1215 (9th Cir. 1998).

[98] *Kern*, 284 F.3d at 1075.

[99] *See, e.g.,* Hall v. Norton, 2004 WL 334452 (9th Cir. Feb. 23, 2004) (BLM's cumulative impacts analysis was adequate where the EA analyzed air quality impacts from development of the proposed 4,700 acre land exchange as well as 25,540 acres of public lands designated as *likely* to be disposed of within the Las Vegas Valley, but not all 57,000 acres which *could* be disposed of) (unpublished).

[100] 315 F. Supp. 2d 1068 (D. Nev. 2004).

[101] *Id.* at 1095 n.10.

[102] *See Kern*, 284 F.3d at 1075; CEQ Guidebook, *supra* note 81, at 45.

[103] *Ocean Advocates*, 402 F.3d at 868; *Kern,* 284 F.3d at 1075; Muckleshoot Indian Tribe v. U.S. Forest Serv., 177 F.3d 800, 810 (9th Cir. 1999).

[104] *Ocean Advocates,* 402 F.3d at 868 (agency finding that dock extension at refinery would not increase oil tanker traffic did not constitute hard look required by NEPA where it relied exclusively on unsubstantiated letter from project applicant) (citing Neighbors of Cuddy Mountain v. U. S. Forest Serv., 137 F.3d 1372, 1379 (9th Cir. 1998)).

area projects and their impacts to allow the decisionmaker to decide whether or how to alter the proposed project to lessen cumulative environmental impacts.[105]

### 1. Aggregating Cumulative Impacts

A cumulative impacts analysis must not only identify the impacts of the proposed project and other past, present, and reasonably foreseeable future actions, but must also analyze the overall impact that can be expected from the accumulation of such individual impacts.[106] When each action's effects are determined, cumulative effects can be calculated and considered for significance.[107] Simply adding together the effects on the resource value from each action may not provide an accurate picture of cumulative impacts.[108] There are cases in which the impacts of multiple actions taken together may be greater than the sum of each separate action.[109] For example, as impacts increase, the affected resource may experience exponential adverse effects if particularly sensitive.[110] On the other hand, in some cases, the resource may be better able to withstand additional impacts as stress increases.[111] Understanding the cause-and-effect relationship between the effects of multiple actions and the adverse impacts on the resource is essential to a proper consideration of cumulative impacts.[112]

### 2. Quantifying Cumulative Impacts

While the CEQ Guidelines may prove practically useful to an agency charged with cumulative impacts review, the Ninth Circuit continues to apply the *Neighbors of Cuddy Mountain* standard of providing "some quantified or detailed information" to determine whether cumulative impacts analysis is adequate.[113] For instance, in *Native Ecosystems Council v. United States Forest Service*,[114] the court determined that the

---

[105] City of Carmel-by-the-Sea v. U.S. Dep't of Transp., 123 F.3d 1142, 1160-1161 (9th Cir. 1997).

[106] *See* CEQ Guidebook, *supra* note 81, at 41 (primary goal is to "determine the magnitude and significance of the environmental consequences of the proposed action *in the context of* the cumulative effects of other past, present, and future actions") (emphasis added).

[107] *Id*. at 42.

[108] *Id*.

[109] *Id*.; *see Klamath-Siskiyou*, 387 F.3d at 994.

[110] CEQ Guidebook, *supra* note 81, at 42.

[111] *Id*.

[112] *Id*.; *see Klamath-Siskiyou*, 387 F.3d at 995 (holding that "while a tally of the total road construction anticipated" is a "good start to an adequate analysis," "it is not a sufficient description of *actual* environmental effects").

[113] 137 F.3d at 1379.

[114] 428 F.3d 1233, 1244-45 (9th Cir. 2005).

analysis of cumulative impacts "easily satisfie[d]" the *Neighbors of Cuddy Mountain* standard. In the *Native Ecosystems* case, the plaintiffs had challenged an EA prepared by the Forest Service for a fire management project in the Helena National Forest, specifically alleging that the EA failed to consider cumulative impacts of the project on goshawk habitat. In finding the Forest Service's analysis adequate, the court noted that the Forest Service had "offered extensive analysis" of the cumulative impacts of the project.[115] The Forest Service had considered the impacts of several fires that had burned through the cumulative effects area and other projects affecting habitat.[116] The Forest Service identified the necessary components of goshawk habitat and "detailed, from a quantitative perspective, the impact of the project on nest sites and acreage suitable as goshawk habitat."[117] The court concluded the "articulate and careful cumulative effects analysis" supported the Forest Service's conclusion that the project, when considered cumulatively with other recent projects and fires in the area, would not cause goshawk habitat to fall below the recommended acreage for nesting, post-fledgling family, and foraging areas.[118]

In contrast, in *Klamath-Siskiyou*, the EAs prepared by BLM for two timber sales failed to "provide any objective quantification of the [cumulative] impacts" or explain why objective data could not be provided.[119] BLM's cumulative impacts analysis had generally described the effect on various resource values as "unchanged," "improved," or "degraded."[120] The Ninth Circuit noted that while it was proper to give qualitative descriptions of some environmental factors, if a resource value is susceptible to quantification, objective data should be provided.[121] In summarizing its holding, the court stated, "[T]he only mention of cumulative effects in the two EAs comes in the form of generalized conclusory statements [of agency experts] that the effects are not significant or will be effectively mitigated. . . . But while conclusions of agency experts are surely entitled to deference, NEPA documents are inadequate if they contain only narratives of expert opinions."[122] The

---

[115] *Id*.

[116] *Id*.

[117] *Id*.

[118] *Id*.

[119] 387 F.3d at 994.

[120] *Id*. at 994.

[121] *Id*. at 994, 994 n.1.

[122] *Id*. at 996.

*Klamath-Siskiyou* court also suggested that the more apparent significant cumulative impacts become, the more discussion an EA must provide.[123]

Though the quantification of resource impacts is an important component of an adequate cumulative impacts analysis, "NEPA does not require the government to do the impractical."[124] If specific quantitative analysis of cumulative impacts would be impractical or so speculative as to render the analysis useless, it may be appropriate to describe the impacts in qualitative terms. The Ninth Circuit has recognized that in some cases, objective data cannot be provided.[125]

### C. Agency's Special Competency to Determine Geographic Scale of Analysis

In *Kleppe v. Sierra Club*,[126] plaintiffs challenged the agency's issuance of coal leases and rights-of-way without preparation of a programmatic EIS addressing coal development throughout the Northern Great Plains region. The Court rejected the challenge, concluding that "determination of [water and air impacts], *and particularly identification of the geographic area within which they may occur, is a task assigned to the special competency of the appropriate agencies*."[127]

In support of their claim that impacts should be analyzed on a regional basis, plaintiffs pointed to the existence of a forthcoming report from the Northern Great Plains Resources Program (NGPRP) studying the potential environmental impact from resource development in Montana, Wyoming, North Dakota, South Dakota, and Nebraska. The court accepted DOI's explanation of the differing purposes of the report and the EIS.

> Resource studies (like the NGPRP) are one of many analytical tools employed by the Department to inform itself as to general resource availability, resource need and general environmental considerations so that it can intelligently determine the scope of environmental analysis and review specific actions it may take. Simply put, resource studies are a prelude to informed agency planning, and provide the data base on which the Department may decide to take specific actions for which impact statements are prepared. The scope of

---

[123] *Id*. at 996 ("[T]he potential for such serious cumulative impacts is apparent here, such that the subject requires more discussion than these EAs provide.").

[124] *Blue Mtns.*, 161 F.3d at 1215 (quoting *Inland Empire Public Lands Council* 88 F.3d at 764.

[125] *See Klamath-Siskiyou*, 387 F.3d at 994 ("The reader is not told what data the conclusion was based on, *or why objective data cannot be provided*.") (emphasis added); *Ocean Advocates*, 402 F.3d at 869 (finding the Corps neglected to "explain why [it] could not provide better or more specific information").

[126] 427 U.S. 390 (1976).

[127] *Id.* at 414 (emphasis added).

> environmental impact statements seldom coincide with that of a given resource study, since the statements evolve from specific proposals for federal action while the studies simply provide an educational backdrop.[128]

In *Habitat Education Center v. Bosworth*,[129] the court held that the Forest Service failed to consider relevant factors when it evaluated cumulative effects to sensitive hawk species in an area including and extending two miles beyond the project area.[130] The Forest Service stated that it chose the "project area plus two" boundary because "the scale is large enough to address habitat and movement concerns for species that use relatively large home ranges," and "because it includes the scale at which vegetation analysis was evaluated and most of the potential impacts to wildlife come from vegetation management."[131] However, the court held that the EIS should have evaluated the project in combination with five other logging projects in the same national forest, citing guidance that an agency should consider effect on species outside the project when analyzing cumulative impacts to wildlife.[132] While the court ultimately relied on specific requirements for cumulative impacts analyses, it also reviewed the requirements for geographic scale more generally:

> The identification of the geographic area within which a project's cumulative impacts on the environment may occur is a task assigned to the special competency of the appropriate agencies. Nevertheless, the choice of analysis scale must represent a reasoned decision and cannot be arbitrary. Thus, an agency must provide support for its choice of analysis area and must show that it considered the relevant factors. Relevant factors include the scope of the project considered, the features of the land, and the types of species in the area. The presence of species habitat outside the project area is also a relevant consideration in determining the geographic scope of a cumulative impacts analysis for wildlife.[133]

---

[128] *Id.* at 413 (citation omitted).

[129] 363 F. Supp. 2d 1070 (E.D. Wis. 2005).

[130] *Id.* at 1077.

[131] *Id.*

[132] *Id.* at 1078.

[133] *Id.* at 1077 (citations and internal quotations omitted). *But see Inland Empire Public Lands Council*, 88 F.3d at 763 (Forest Service's analysis was adequate where it considered impacts within the entire watershed, which was larger than the project area. Mandating a separate geographic boundary for consideration of impacts to each species depending on the ecosystem that comprised each species' habitat would require agency to do the impractical).

### D. Additional Considerations on Geographic Scope of Impacts Analysis

The CEQ regulations require that an EIS "succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration."[134] However, it appears that challenges to the scale of analysis in an EIS arise more often in the context of cumulative impacts, as opposed to challenges that the affected environment was defined too narrowly. The CEQ Guidance notes that "[d]escribing the affected environment when considering cumulative effects does not differ greatly from describing the affected environment as part of project-specific analyses[,]" though the cumulative analysis is more expansive in geography and time.[135] This suggests that case law addressing the scale of cumulative impact analyses is also informative on the question of the required scale for a project impact analysis.

Based on the NEPA case law, three general principles can be discerned on the required scale of analysis:

1. Agency determinations of geographic scope are entitled to deference;
2. Despite judicial deference, courts will strike down agency determinations when they do not respond to conflicting or inconsistent agency positions or data in the record;
3. The appropriate scale of analysis varies depending on the resource in question.

### E. Need to Address Conflicting Information

Despite judicial deference to agency determinations on questions of scale, where plaintiffs, commenters, or the agency itself have advocated planning or studying a resource on a different scale, courts have found EISs inadequate for failure to justify evaluation of project impacts on a different scale.

In *Idaho Sporting Congress v. Rittenhouse*,[136] the court recognized that an agency ordinarily has the discretion to determine the physical scope used for measuring environmental impacts (citing *Kleppe*), but nonetheless held that the Forest Service was arbitrary in choosing the "home range" of various species as the scale of analysis for cumulative effects to wildlife. The agency failed to address conflicting evidence from its own experts who had previously determined "Forest Plan direction is inadequate to

---

[134] 40 C.F.R. § 1502.15.

[135] CEQ Guidance, *supra* note 81, at 23.

[136] 305 F.3d 957 (9th Cir. 2002).

provide for habitat needs, because the habitat needs of these species must be addressed at a landscape scale."[137]

Similarly, in *Utahns for Better Transportation v. U.S. Department of Transportation*,[138] the court held that an EIS's discussion of impacts to migratory birds was inadequate where it only considered impacts on wildlife habitat within an arbitrary 1000-foot distance from the highway right of way. The FWS had submitted evidence of the potential for significant adverse effects to bird populations as far as 1.24 miles from roadways in open terrain like that adjacent to the project, and had raised concerns that the 1000-foot boundary effectively limited any assessment of wildlife use and value to smaller, less mobile species and ignored impacts to migratory birds.[139] Thus, "[t]he record repeatedly and without contradiction indicates that the 1000-foot limit used in the FEIS does not allow for consideration of impacts on migratory birds." The failure to address these impacts or respond adequately to the comments rendered the FEIS's discussion of migratory bird impacts "simply inadequate."[140]

### F. Relationship Between Resource and Study Area

The Ninth Circuit has recognized that the "task of selecting the geographic boundaries of an EIS requires a complicated analysis of several factors, such as the scope of the project considered, the features of the land, and the types of species in the area," and that this determination is a task assigned to the special competency of the appropriate agencies.[141] The court concluded that a Forest Service EIS for access to a national forest inholding was adequate, despite the Forest Service's decision not to consider the cumulative wildlife impacts of another access proposal in a neighboring forest. The Forest Service had determined that because the forests were separated by a ridgeline and located in separate watershed, viewshed and endangered species management areas, and "[b]ecause of topography there would be no additional cumulative effects."[142] Indeed, a wildlife biologist expressed concern that combining the forests for cumulative impacts purposes would minimize impacts because "the magnitude of the effects would actually appear to be less as they would be spread over a larger area."[143]

---

[137] *Id.* at 973.

[138] 305 F.3d 1152 (10th Cir. 2002).

[139] *Id.* at 1179-80.

[140] *Id.* at 1180.

[141] *Selkirk Conservation Alliance,* 336 F.3d at 958 (citing *Kleppe,* 427 U.S. at 414).

[142] *Id.* at 958.

[143] *Id.* at 959.

In *Laguna Greenbelt v. U.S. Department of Transportation*,[144] the court rejected allegations that an agency had used different scales of analysis to minimize adverse impacts and inflate benefits of a tollroad.

> Laguna's assertion that the tollroad's positive effects on air quality and traffic conditions are analyzed using a regional description is correct. Laguna is also correct that the EIS focuses on an area approximately one quarter mile wide on either side of the proposed corridor centerline in its discussion of certain biological impacts. However, the EIS also discusses the corridor's negative impacts on biological resources in an area beyond the half mile area of impact. For instance, the EIS discusses impacts in 12 wildlife movement corridors within and outside the area, and it discusses the tollroad's effects on plant communities in the San Joaquin Hills. Thus, the EIS discusses negative impacts on biological resources in a cumulative and regional way as well, and therefore does not present a skewed analysis.[145]

The Ninth Circuit upheld the district court's determination that for some environmental effects (such as wetlands impacts), a smaller area of impact may need to be considered, whereas for others (such as wildlife movement or air quality), a larger area should be studied, and found the EIS's method of describing the area of impact resulted in a reasoned analysis.[146]

### G. Potential Implications of Scale of Analysis for Modeling Adequacy

The Ninth Circuit has underscored that an agency may not act now and study later, and that an agency must take a "hard look" at impacts "before, not after, the environmentally-threatening actions are put into effect."[147] The Ninth Circuit has also emphasized that NEPA requires the "up-front disclosures of relevant shortcomings in the data or models."[148] This enhanced scrutiny weighs in favor of anticipating challenges to a NEPA document's study area and ensuring that any uncertainties are disclosed, and that the reasoning and data supporting assumptions are transparent and documented in the administrative record.

---

[144] 42 F.3d 517 (9th Cir. 1994).

[145] *Id.* at 529 (citations omitted).

[146] *Id.* at 529.

[147] *Nat'l Parks*, 241 F.3d at 733 (agency could not rely on future studies of potential impacts from increased cruise ship traffic in Glacier Bay).

[148] Lands Council v. Powell, 395 F.3d 1019, 1032 (9th Cir. 2005) (citing 40 C.F.R. § 1502.22) (reversing the Forest Service's decision approving watershed restoration and timber harvest project because the agency failed to disclose that its WATSED (Water and Sediment Yields) model did not include relevant variables).

## VII. Growth Inducting Effects

NEPA requires consideration of all "reasonably foreseeable" direct and indirect impacts of a proposed action, which includes "growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."[149] The problem of induced growth arises fairly frequently in NEPA cases.[150] NEPA requires agencies to consider the growth-inducing effects of proposed actions.[151] A conclusory statement that growth will increase with or without the project, or that development is inevitable, is insufficient; the agency must provide an adequate discussion of growth-inducing impacts.[152] While the case law remains mixed, the better reasoned decisions appear to require some analysis of growth and land use impacts resulting from a project that encourages or allows growth.[153] In the minority view, growth may happen anyway and need not be addressed in the NEPA document.[154]

---

[149] 40 C.F.R. § 1508.8(b).

[150] *See* Daniel R. Mandelker, *NEPA Law and Litigation* §§ 8:41, 10:41 (2d ed. 2011).

[151] 40 C.F.R. § 1508.8(b); *WXLP*, 315 F. Supp. 2d 1088-90 (an agency must consider the growth-inducing effects of a project when stimulating growth and development is one of the project's goals); *City of Carmel-by-the-Sea*, 123 F.3d at 1162.

[152] *Laguna Greenbelt,* 42 F.3d at 526 (9th Cir. 1994). Davis v. Mineta, 302 F.3d 1104, 1123 (10th Cir. 2002).

[153] City of Davis v. Coleman, 521 F.2d 661 (9th Cir. 1975); Coalition for Canyon Pres. v. Bowers, 632 F.2d 774 (9th Cir. 1980); Friends of the Earth, Inc. v. U.S. Army Corps of Eng'rs, 109 F. Supp. 2d 30, 41 (D.D.C. 2000) (holding in case involving Corps permit allowing three proposed floating casino projects off the Mississippi Coast that "[s]ince the economic development of these areas [near the proposed casinos] is the announced goal and anticipated consequence of the casino projects, the Corps cannot claim that the prospect of secondary development is 'highly speculative' "); TOMAC v. Norton, 240 F. Supp. 2d 45 (D.D.C. 2003) (holding in case involving the construction of a tribal casino outside a small community that BIA had failed to explain why it had concluded that the local growth and development effects it had identified were not significant; based on these deficiencies, the court concluded that the BIA had failed to adequately analyze the potential growth-inducing effects of the casino construction); Sierra Club v. U.S. Dep't Transp., 962 F. Supp. 1037 (N.D. III. 1997); Sierra Club v. Marsh, 769 F.2d 868 (1st Cir. 1985) (holding in Corps of Engineers case on project for the construction of a port and causeway on an undeveloped island off the coast of Maine that the growth-inducing effects of the proposed action were significant enough to require preparation of an EIS and the Corps' decision not to do so was arbitrary and capricious).

[154] *See, e.g.*, Ga. River Network v. U.S. Army Corps of Eng'rs, 334 F. Supp. 2d 1329, 1344-45 (N.D. Ga. 2004) (holding in case involving construction of new reservoir that "the purpose of the reservoir is to keep up with the water demands of Henry County's increasing population, not that the projected population growth rate is attributable to the construction of this Reservoir;" thus, because the Corps was required only to look at the indirect effects of the reservoir itself, it was not required to consider the environmental consequences of the county's population growth); Hoosier Envtl. Council, Inc. v. U.S. Army Corps of Eng'rs, 105 F. Supp. 2d 953 (S.D. Ind. 2000) (holding that Corps did not need to consider growth-

In general, the federal courts have consistently refused to require agencies to assess indirect impacts from local growth in those instances where the record demonstrated that development in an area was already planned, committed, zoned, and in progress irrespective of the proposed project. In doing so, courts have differentiated growth-inducing federal projects from federal projects that merely assist local governments in meeting the needs of an already expanding population. The latter are viewed as "inevitable growth" and as such are not considered indirect impacts of the federal project. However, to reduce litigation risk, agencies sometimes attempt to make some quantitative or qualitative comparison of induced growth and changes in land use with and without the project (whether or not there is a direct cause and effect relationship between the project and the expected growth).[155]

In contrast, a court may be tempted to remand an EIS for analysis of growth inducing effects if the FEIS completely ignores the induced growth issue and the purpose and need for the project are based on robust growth projections. In *WLXP*, the court appeared to impute stimulating population growth as an implicit purpose of the project simply because the purpose and need relied on "aggressive" development plans and projections.[156]

## PART TWO

### VIII. The Standard of Review—The "Hard Look" Becomes the "Harder Look"

Consistent with the fundamental principles of judicial review of agency action, federal courts reviewing challenges to agency NEPA

---

inducing effects in permitting a riverboat casino where there the record did not suggest any planned residential or commercial development in the vicinity of the casino); *Laguna Greenbelt*, 42 F.3d at 525-26 (upholding agencies' EIS conclusions, based in part on local planning documents, that highway development would not affect the amount or pattern of growth in Orange County, California); *Utahns for Better Transp.*, 305 F.3d at 1174 (10th Cir. 2002) ("reliance [on local land use plans] may readily show that land use impacts may be nil because the surrounding land at issue is already developed or is otherwise committed to uses that were not contingent on the project under consideration").

[155] *See Carmel-by-the-Sea*, 123 F.3d at 1162 (holding that NEPA did not require additional discussion of induced growth because (1) "the surrounding land at issue was already developed or was otherwise committed to uses that were" covered in local land use master plans, and (2) the FEIS included the requested analysis by acknowledging that development may result from the freeway project—"Here, however, the [FEIS] admits that development may result from the freeway project"); *see also* NRDC v. FAA, 564 F.3d 549, 560 (2d Cir. 2009) (holding that no additional analysis of induced growth was required because the FEIS adequately compared wetlands impacts from induced growth at an industrial park that would eventually be built near a new airport proposed for approval by FAA).

[156] 315 F. Supp. 2d at 1089-90 ("Furthermore, the [induced growth] impacts were not just 'reasonably foreseeable,' but actually intended. Aggressive development of the land was the assumed purpose of the entire disposal project.").

decisions traditionally deferred to the agency's impact assessment methodology and selection and use of scientific information, especially for complex and technical matters. As one court noted, "NEPA does not require [that we] decide whether an [environmental impact statement] is based on the best scientific methodology available, nor does NEPA require us to resolve disagreements among various scientists as to methodology."[157]

A series of NEPA decisions authored over the last twelve years documents that in reviewing an agency's assessment of environmental impacts, courts increasingly are looking past the agency's science-based conclusions and are probing deeper into the data, models, methodologies, and assumptions that underlie the agency's assessments. Doing so does not *per se* represent a shift in the traditional standard of review of agency action, nor does it necessarily represent an abandonment of the time-honored precept that courts should defer to an agency's technical and scientific expertise. Indeed, requiring an agency to articulate the rationales for its choice of scientific approach and methodology, and to assess the adequacy and quality of the underlying data used in its environmental evaluations, gives continued meaning and substance to the regulations. Those regulations direct environmental agencies to use and give thoughtful consideration to high-quality information, accurate scientific analyses, and expert agency comments, and otherwise to ensure the professional and scientific integrity of NEPA evaluations.

A close examination of the caselaw, however, indicates that courts are taking a "harder look" than ever before at the scientific information and analyses used in federal agency NEPA decisions. This Part Two reviews the shift in the federal courts' review of impact assessment issues under NEPA.

## IX. Judicial Review of Agency NEPA Decisions—The Standard of Review Framework

NEPA decisions are reviewed in federal court under the Administrative Procedure Act.[158] Subsections 706(2)(A) and (D) authorize a reviewing court to hold unlawful and set aside agency action found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law; or without observance of procedure required by law.[159] In NEPA cases, this standard of review incorporates a "rule of reason" whereby the court makes a "pragmatic judgment whether the EIS's form, content and

---

[157] Salmon River Concerned Citizens v. Robertson, 32 F.3d 1346, 1359 (9th Cir. 1994) (alterations in original).

[158] 5 U.S.C. § 706.

[159] *Id.* § 706(2)(A), (D).

preparation foster both informed decision-making and informed public participation."[160]

Courts have generally deferred to the agency's choice on questions of the proper weight to give various scientific information and impact assessment determinations, particularly if those questions implicate the agency's area of expertise.[161] While the overall standard of review is narrow, the court must still ensure that the agency examined the relevant factors and articulated a satisfactory explanation for its actions.[162] The court must " 'steep' itself in technical matters sufficiently to determine whether the agency 'has exercised reasoned discretion.' "[163] Furthermore, if the agency has failed to "articulate a rational connection between the facts found and the choice made," the agency's decision cannot be upheld.[164] If the agency takes a " 'hard look' at the environmental consequences of the proposed action, the court will not second-guess the wisdom of the ultimate decision."[165]

In reviewing NEPA cases, it is easy to skip past these familiar administrative law and judicial review principles to get into the heart of the case without considering the degree to which the court's decisionmaking was guided by, or comports with, those standards. This Part Two focuses specifically on that latter question, in the context of judicial review of agency compliance with NEPA's scientific analysis and impact assessment requirements.

## X. Developing Trends in Judicial Review of Agency Compliance With NEPA's Impact Assessment Requirements

### A. The Harder Look

Courts continue to recognize the established formulations of the "hard look," "rule of reason," and "arbitrary and capricious" articulations of the

---

[160] Native Ecosystems Council v. U.S. Forest Serv., 418 F.3d 953, 960 (9th Cir. 2005) (quoting California v. Block, 690 F.2d 753, 761 (9th Cir. 1982)).

[161] *See* Marsh v. Or. Nat. Resources Council, 490 U.S. 360, 378 (1989); Baltimore Gas & Elec. Co. v. Nat. Resources Def. Council, 462 U.S. 87, 103 (1983). Some commentators have referred to this traditional rule as the courts' encouragement of "super-deference" to an agency's scientific determination, especially one made at the "frontiers of scientific knowledge." Thomas O. McGarity & Wendy E. Wagner, "Legal Aspects of the Regulatory Use of Environmental Modeling," 33 *Envtl. L. Rep.* (*Envtl. Law Inst.*) 10751, 10757 n.44 (2003) (citing *Baltimore Gas & Elec.*, 462 U.S. at 103).

[162] *See* Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto Ins. Co., 463 U.S. 29, 43 (1983).

[163] Chemical Mfrs. Ass'n. v. EPA, 870 F.2d 177, 199, *clarified on rehearing on other grounds*, 885 F.2d 253 (5th Cir. 1989); *see also* Mississippi River Basin Alliance v. Westphal, 230 F.3d 170, 174-75 (5th Cir. 2000).

[164] *State Farm*, 463 U.S. at 43.

[165] *Utahns for Better Transp.*, 305 F.3d at 1163.

standard of review in NEPA cases. Nonetheless, in recent years—since at least 1998 if not earlier—the federal courts have begun to dig deeper into the administrative record and are reviewing more closely whether agencies have met the CEQ requirements for high-quality information, accurate scientific analyses, expert agency comments, public scrutiny, and the professional and scientific integrity of the environmental analyses used in NEPA documents. I call this phenomenon "harder-look" judicial review.

### B. *Ecology Center v. Austin*—Marking the Shift

An initial example of this harder-look judicial inquiry into the substantive components of agency NEPA decisions is the Ninth Circuit's decision in *Ecology Center, Inc. v. Austin*.[166] Although later overruled by an en banc panel in a subsequent case, the *Ecology Center* decision is still illustrative. In a 2-1 split panel decision, the Ninth Circuit held that the Forest Service violated NEPA by failing to verify, with representative field sampling, the soils modeling used to predict impacts of a proposed post-burn forest restoration project, which included thinning of small diameter timber, prescribed burning in old-growth forest stands, and salvage logging of burned and insect-killed timber in the project area.[167]

The *Ecology Center* decision was based in part on the court's earlier decision in *Lands Council v. Powell*[168] that the Forest Service had not adequately established, under the National Forest Management Act (NFMA) or NEPA, that the Regional Soil Quality Standard guideline would be met.[169] In *Lands Council*, the court held that the Forest Service's reliance on "spreadsheet models, unaccompanied by on-site spot verification of the model's predictions, violated NFMA."[170] While the court noted the traditional standard that it "is required to defer to agency expertise, the agency is not permitted to adopt and rely upon a methodology without reasonably verifying its reliability."[171]

Applying this same rationale from *Lands Council* and the NFMA context, the Ninth Circuit held in *Ecology Center* that the same lack of field verification of the agency's spreadsheet model violated NEPA in two ways. First, the Forest Service could not avoid an obligation to verify the model's approach to documenting compliance with the Regional Soil Quality Standard because the project EIS treated that Standard as

---

[166] 430 F.3d 1057 (9th Cir. 2005), *cert. denied,* 127 S. Ct. 931 (2007), *overruled by* Lands Council v. McNair, 537 F.3d 981, 990, 994, 1001 (9th Cir. 2008) (en banc).

[167] *Id*. at 1061, 1070-71.

[168] 379 F.3d 738 (9th Cir. 2004), *amended and superseded by* 395 F.3d 1019 (9th Cir. 2005).

[169] *See Ecology Ctr.*, 430 F.3d at 1068-69.

[170] *Lands Council*, 379 F.3d at 752-53.

[171] *Ecology Ctr.*, 430 F.3d at 1069 n.3 (citing *Lands Council*, 379 F.3d at 752).

binding.[172] Second, the EIS approach to "verify soil conditions in the activity areas after authorizing the Project, but before actually commencing [timber] harvesting activities," could not cure the lack of field verification of the reliability of the agency's model.[173] "NEPA requires consideration of the potential impact of an action *before* the action takes place."[174]

The *Ecology Center* majority's application of harder-look review was criticized by Judge Margaret McKeown in her dissenting opinion. She stated that "there is no legal basis to conclude that [NEPA] requires an on-site analysis where there is a reasonable scientific basis to uphold the legitimacy of modeling."[175] Judge McKeown declared that the majority's holding "represents an unprecedented incursion into the administrative process and ratchets up the scrutiny we apply to the scientific and administrative judgments of the Forest Service. . . . [T]he majority has, in effect, displaced 'arbitrary and capricious' review for a more demanding standard."[176] Judge McKeown further observed:

> Apparently we no longer simply determine whether the Forest Service's methodology involves a "hard look" through the use of "hard data," but now are called upon to make fine-grained judgments of its worth. In reaching this conclusion, the majority takes aim at two firmly established lines of precedent in administrative law. First, this view is contrary to the basic principle that we reverse agency decisions only if they are arbitrary and capricious. This standard of review does not direct us to literally dig in the dirt (or soil, as it were), get our fingernails dirty and flyspeck the agency's analysis. Yet the majority does exactly that by rejecting the Forest Service's soil analysis field checks and its observations and historical data in treated old-growth forests. [Second, t]he majority's rationale cannot be reconciled with our caselaw requiring "[d]eference to an agency's technical expertise and experience," particularly "with respect to questions involving engineering and scientific matters."[177]

---

[172] 430 F.3d at 1069.

[173] 430 F.3d at 1071.

[174] *Id*. (quoting *Neighbors of Cuddy Mtn.*, 137 F.3d at 1380).

[175] *Id*. at 1073 (McKeown, J., dissenting).

[176] *Id*. at 1072 (McKeown, J., dissenting).

[177] *Id*. at 1077 (McKeown, J., dissenting) (quoting United States v. Alpine Land & Reservoir Co., 887 F.2d 207, 213 (9th Cir. 1989), and citing Westlands Water Dist. v. U.S. Dep't of Interior, 376 F.3d 853, 871 (9th Cir. 2004)).

### C. *Lands Council v. McNair*—First Continuing and then Containing the Shift?

The judicial discussion sparked by the *Ecology Center* decision continued. In the initial panel decision in *Lands Council v. McNair*,[178] the Ninth Circuit held, in the preliminary injunction context of reviewing whether plaintiffs had shown a likelihood of success on the merits that a Forest Service timber management and logging project violated NEPA, that the agency "failed to include a full discussion of the scientific uncertainty surrounding its strategy for improving wildlife habitat."[179] The challenged EIS "treats the prediction that treatment will benefit old-growth dependent species as a fact instead of an untested and debated hypothesis."[180] Thus, the court held, the Forest Service failed to address in a "meaningful way the various uncertainties surrounding the scientific evidence" concerning the probable environmental effects of its action,[181] thwarting NEPA's purposes of informed decisionmaking and informed public disclosure.[182]

Judge Milan Smith, Jr., wrote a special concurrence in *McNair* to note that while the Ninth Circuit's *Ecology Center* decision was binding circuit law and controlled the outcome in *McNair*, he like Judge McKeown "believe[s] that *Ecology Center* was wrongly decided."[183] Judge Smith wrote that following *Ecology Center* in *McNair* "compounds already serious errors of federal law"[184] and required the court to move from "simply determine[ing] whether the Forest Service's methodology involves a 'hard look' through the use of 'hard data' to mak[ing] fine-grained judgments of its worth."

In response to Judge Smith's special concurrence, Judge Ferguson, who authored the majority opinion, also wrote a concurrence, in which Judge Reinhardt joined. Judge Ferguson stated that he saw "little controversy in holding that an agency's failure to confirm its hypotheses in a project area as arbitrary and capricious," and noted that the Supreme Court denied certiorari in the *Ecology Center* case.[185] Judge Ferguson also

---

[178] 494 F.3d 771 (9th Cir. 2007), *vacated on rehearing*, 537 F.3d 981 (9th Cir. 2008) (en banc).

[179] 494 F.3d at 778.

[180] *Id.* (citing and quoting *Ecology Ctr.*, 430 F.3d at 1065).

[181] *See id.* (quoting *Ecology Ctr.*, 430 F.3d at 1065).

[182] *Id.* at 777; *see also Ecology Ctr.*, 430 F.3d at 1067 ("the information in the . . . EIS was so incomplete or misleading that the decisionmaker and the public could not make an informed comparison of the alternatives").

[183] *McNair,* 494 F.3d at 780 (Smith, J., specially concurring).

[184] *Id.*

[185] *Id.* at 786 (Ferguson, J., concurring).

responded to Judge Smith's contentions that "broad injunctions against the logging industry," based "upon misconstructions of federal law that frustrate the careful legal balance struck by the democratic branches of our government" have had adverse economic effects on the natural resources industries and were cause to question the court's application of federal environmental law. Judge Ferguson noted that any apparent "pattern of injunction means that there has been a pattern of illegal conduct, not that there is something wrong with the courts' handling of environmental cases."[186] Further, "[t]he frequency of injunctions is evidence of the frequency of unlawful agency actions, nothing more and nothing less."[187] Moreover, Judge Ferguson asserted that Judge Smith's special concurrence "impugns the last several decades of our circuit's environmental law jurisprudence."[188]

Following the Ninth Circuit panel decision in *McNair*, the Ninth Circuit granted rehearing en banc. Judge Smith ended up writing the decision for the en banc court "to clarify some of our environmental jurisprudence with respect to our review of actions of the United States Forest Service."[189] The en banc court vacated the panel decision and affirmed the original district court's decision denying the preliminary injunction.

In setting forth the standard of review for the determination of the likelihood of success on the merits as part of the preliminary injunction claim, the en banc court reiterated that its review was under the APA's arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law standard,[190] and that such review "is narrow, and [we do] not substitute [our] judgment for that of the agency."[191] The Court first reviewed the NFMA claims, and in doing so explicitly overruled the Ninth Circuit's earlier *Ecology Center* decision.[192] The en banc court specifically rejected the broad rule "grafted onto our jurisprudence" in *Ecology Center* that, "in effect, requires the Forest Service to always 'demonstrate the reliability of its scientific methodology' or the hypotheses underlying the Service's methodology with 'on the ground analysis.' "[193] As Judge Smith wrote:

---

[186] *Id.*

[187] *Id.* at 787.

[188] *Id.* at 786.

[189] Lands Council v. McNair, 537 F.3d 981, 984 (9th Cir. 2008) (en banc).

[190] *McNair*, 537 F.3d at 987 (citing 5 U.S.C. § 706(2)(A)).

[191] *McNair*, 537 F.3d at 987 (quoting Earth Island Inst. v. U.S. Forest Serv., 442 F.3d 1147, 1156 (9th Cir. 2006)).

[192] *See McNair*, 537 F.3d at 990, *overruling* Ecology Center, Inc. v. Austin, 430 F.3d 1057 (9th Cir. 2005).

[193] *McNair*, 537 F.3d at 990 (quoting *Ecology Ctr.*, 430 F.3d at 1064).

> We made three key errors in *Ecology Center*. First, we read the holding of *Lands Council I* too broadly. Second, we created a requirement not found in any relevant statute or regulation. And, third, we defied well-established law concerning the deference we owe to agencies and their methodological choices. Today, we correct those errors.[194]

The *McNair* court went on to hold that the Forest Service was free to use on-the-ground analysis if it deemed it appropriate or necessary, but it was not required to do so.[195]

> Granting the Forest Service the latitude to decide how best to demonstrate that its plans will provide for wildlife viability comports with our reluctance to require an agency to show us, by any particular means, that it has met the requirements of the NFMA every time it proposes action. . . . Were we to grant less deference to the agency, we would be ignoring the APA's arbitrary and capricious standard of review. *Ecology Center* illustrates the consequences of failing to grant appropriate deference to an agency.[196]

Thus, the court concluded, for the NFMA claims,

> As non-scientists, we decline to impose bright-line rules on the Forest Service regarding particular means that it must take in every case to show us that it has met the NFMA's requirements. Rather, we hold that the Forest Service must support its conclusions that a project meets the requirements of the NFMA and relevant Forest Plan with studies that the agency, in its expertise, deems reliable. The Forest Service must explain the conclusions it has drawn from its chosen methodology, and the reasons it considers the underlying evidence to be reliable. We will conclude that the Forest Service acts arbitrarily and capriciously only when the record plainly demonstrates that the Forest Service made a clear error in judgment in concluding that a project meets the requirements of the NMFS and relevant Forest Plan."[197]

The court then addressed the plaintiffs' NEPA claims. There, the court noted that "NEPA, unlike the NFMA, does not impose any substantive requirements on federal agencies—it exists to ensure a process."[198] "To that end," the court stated, "NEPA requires agencies to take a 'hard look' at the environmental consequences of their actions by preparing an EIS for

---

[194] *McNair*, 537 F.3d at 991.

[195] *Id.*

[196] *Id*.

[197] *Id*. at 993-94.

[198] *Id.* at 1000 (internal quotation omitted).

each 'major Federal action[ ] significantly affecting the quality of the human environment.' "[199] According to the *en banc* court, "none of NEPA's statutory provisions or regulations requires the Forest Service to affirmatively present every uncertainty in its EIS. Thus, we hold that to the extent our case law suggests that a NEPA violation occurs every time the Forest Service does not affirmatively address an uncertainty in the EIS, we have erred."[200] After all, "to require the Forest Service to affirmatively present every uncertainty in its EIS would be an onerous requirement, given that experts in every scientific field routinely disagree; such a requirement might inadvertently prevent the Forest Service from acting due to the burden it would impose."[201]

The *McNair* court still reaffirmed "that the Forest Service must acknowledge and respond to comments by outside parties that raise significant scientific uncertainties and reasonably support that such uncertainties exist."[202] The Forest Service "does not, however, have the burden to anticipate questions that are not necessary to its analysis, or to respond to uncertainties that are not reasonably supported by any scientific authority."[203] After restating these standards, the *en banc* court then considered whether the Forest Service had violated NEPA in this instance by failing to address scientific uncertainty. The plaintiffs had relied on two research papers cited in its administrative appeal to demonstrate that the Forest Service did not adequately address scientific uncertainty in its NEPA analysis. The *en banc* court determined that the Forest Service's discussion of these papers in the EIS was adequate because the Forest Service had undertaken the area-specific research and "field reconnaissance" in the project area called for in one of the papers, and had discussed how the treatment the agency proposed, which it also modeled, would maintain the dry-forest, old-growth stands, and the agency cited literature explaining that the proposed treatments would improve tree vigor and resistance to insects and disease.[204]

In sum, the court concluded that the Forest Service did not ignore the potential for adverse impacts from logging in old-growth forest stands, but instead explained adequately that its actions would not decrease suitable habitat in the short-term and would enhance it in the long-term.[205] Also, the court approved of the Forest Service's approach to use habitat as a

---

[199] *Id.* at 1000-01 (quoting 42 U.S.C. § 4332(C)) (alteration by court).

[200] *McNair*, 537 F.3d at 1001.

[201] *Id.*

[202] *Id.*

[203] *Id.* at 1002.

[204] *Id.* at 1002-03.

[205] *Id.* at 1003.

proxy for wildlife effects when "the Forest Service concludes, in its expertise, that it is reasonable to assume that a project will maintain a species' viability if the project will maintain suitable habitat for the species."[206]

> Though the Forest Service must explain the methodology it used for its habitat suitability analysis, which the Forest Service did here, NEPA does not require us to decide whether an [EIS] is based on the best scientific methodology available. And, we will not find a NEPA violation based on the Forest Service's use of an assumption that we approve.[207]

Thus, the court concluded that the Forest Service "took the requisite 'hard look' at the environmental impacts of the Project to satisfy NEPA."[208]

The *en banc* decision in *McNair* at first appeared to mark the end of the shift toward "harder look" review under NEPA. But, as in many areas of the law, decisions subsequent to *McNair* show that the debate highlighted in the original panel decision continues. By whatever standard and whatever name, courts in the Ninth Circuit and elsewhere are continuing with "harder look" review under NEPA.

For instance, in *Native Ecosystems Council v. Tidwell*,[209] the Ninth Circuit set aside the Forest Service's approval of grazing allotments based on the court's determination that the Forest Service's methodology for evaluating impacts to sage-grouse was flawed and did not constitute "the requisite 'hard look' mandated by NEPA."[210] Specifically, for the same reasons that the court held that the Forest Service's approach violated the NFMA, the court held that it violated NEPA. The agency used a "proxy-on-proxy" approach to evaluate potential effects on sage-grouse. Under the applicable forest plan, sage-grouse were designated as the management indicator species for the sagebrush communities. But sage-grouse were virtually non-existent in the project area, and because actual sage-grouse population data was unavailable, the Forest Service's NEPA analysis (an EA) looked to the sagebrush habitat to assess population viability for the sagebrush obligate species.

This was the "proxy-on-proxy" approach, whereby the Forest Service used habitat as a proxy to measure a species population, and then used that species population as a proxy for the population of another species.[211] In short, the court concluded that the Forest Service could not "meet its

---

[206] *Id.*

[207] *Id.* at 1003 (citations and internal quotations omitted).

[208] *Id.*

[209] 599 F.3d 926 (9th Cir. 2010).

[210] *Id.* at 937.

[211] *Id.* at 933.

obligations to the environment by naming a virtually non-existent species to serve as a proxy for critical habitat in the targeted area."[212] "Far from usurping the agency's role, our opinion holds the agency to its statutory responsibility to fully study the effects of the planned agency action."[213]

Chief Judge Kozinski dissented, and, citing the en banc decision in *McNair*, noted that *McNair's* tempering of the harder-look standard of review was "plainly inconsistent" with the majority's result in *Tidwell* that "the Service prove that each indicator species lives in the project area."[214] Chief Judge Kozinski went on to note that the *Tidwell* majority's NEPA holding

> doubles down on the same point the majority makes about NFMA—that no project can be undertaken without studying animals that actually live in the project site. But the majority never explains why violating NFMA's substantive requirements is necessarily enough to fail the more lenient NEPA requirement of a "hard look" that doesn't "rely on incorrect assumptions or data."[215]

Emphasizing that the debate over the harder-look standard continues, Chief Judge Kozinski stated: "A hard look is a hard look no matter what the Service sees, even if judges see something else."[216]

Still, harder look does live on in the Ninth Circuit despite some judges' attempts to enforce the court's more cautious en banc formulation from *McNair*.[217] For instance, in *National Parks & Conservation Association v. Bureau of Land Management*,[218] the court held that an EIS for a proposed land exchange was inadequate under NEPA where it failed to properly consider the potential for eutrophication in the desert environment because the EIS contained no specific discussion of that potential impact.[219] While there was some discussion of potential eutrophication impacts in different sections of the EIS, the court concluded that the discussion was "neither full nor fair [because] . . . [a] reader seeking enlightenment on the issue would have to cull through entirely unrelated sections of the EIS and then

---

[212] *Id.* at 934. *But see* Lands Council v. McNair, 629 F. 3d 1070, 1082 (9th Cir. 2010) (upholding Forest Service proxy-on-proxy approach for flammulated owls where species was difficult to detect and agency used available scientific data to reach its conclusions).

[213] *Id.*

[214] *Id.* at 940 (Kozinski, C.J., dissenting).

[215] *Id.* at 941 (quoting *Native Ecosystems Council*, 418 F.3d at 964).

[216] *Id.* at 942.

[217] *See also* Ctr. for Biological Diversity v. Dep't of Interior, 623 F.3d 633, 648-50 (9th Cir. 2010) (setting aside EIS for land exchange); *id.* at 666 ("Today's opinion embodies the type of judicial meddling in agency action that we intended to put to rest in *Lands Council [v. McNair]*.") (Tallman, J., dissenting).

[218] 606 F.3d 1058 (9th Cir. 2010).

[219] *Id.* at 173.

put the pieces together."[220] Thus, "[r]ather than address eutrophication up front, the BLM instead attempts to cobble together a 'hard look' of various other analyses as varied as air quality and disease vector control. This patchwork cannot serve as a 'reasonably thorough' discussion of the eutrophication issue."[221] Judge Trott dissented, urging that the various discussions of eutrophication throughout the EIS were sufficient to address the point and relatively identifiable, even in the voluminous record. In sum, Judge Trott viewed all of this material as sufficient to meet the "hard look" requirement, although the majority disagreed and reasoned that the "pragmatic judgment" standard under which the EIS was evaluated still was not met here.[222]

### D. Geographic Scope of the Harder Look

The Ninth Circuit's line of cases—from *Ecology Center* and *McNair* to *Tidwell*, *National Parks* and beyond—is likely the leading example of harder-look review.[223] However, decisions from other federal circuit courts document the larger geographic reach of this shifting standard. For example, in *Hughes River Watershed Conservancy v. Glickman*,[224] the Fourth Circuit held that the Army Corps of Engineers (Corps) had violated NEPA by failing to seriously consider expert opinions that construction of the proposed dam would likely result in zebra mussel infestation of the created reservoir and the downstream reaches of the North Fork River System.[225] The Corps concluded, based on the opinion of its own employees, that infestation was inevitable, regardless of construction of the proposed dam.[226] The Fourth Circuit acknowledged that "[w]hen specialists express conflicting views, an agency must have discretion to rely on the reasonable opinions of its own qualified experts."[227] In this case, however, the court held that the record failed to demonstrate that the Corps' own employees were qualified or that their opinions were reasonable.[228]

In *Davis Mountains Trans-Pecos Heritage Association v. FAA*,[229] the Fifth Circuit, relying on an aerodynamics text and declarations of the

---

[220] *Id.*

[221] *Id.* at 1073-74.

[222] *Id.* at 1088 (Trott, J., dissenting).; *id.* at 1074 n.14 (majority opinion).

[223] *See infra* § XI.

[224] 81 F.3d 437 (4th Cir. 1996).

[225] *Id.* at 445-46.

[226] *Id*.

[227] *Id*. at 445.

[228] *Id*.

[229] 116 Fed. Appx. 3, 11-13 (5th Cir. 2004) (unpublished).

plaintiffs' and agencies' aeronautical engineering experts, re-examined the Federal Aviation Administration's (FAA) evaluation of proposed Air Force low-level bomber training overflight above private ranchlands. The court determined that the agency "failed to take a hard look at the possible effects of wake turbulence on ground structures." The Fifth Circuit ruled that the two documents relied on by the agencies—an e-mail and a chart developed from an "oversimplified" equation that "underestimate[d] the maximum vortex strength"—misinformed both public participation and the agencies' conclusions on this scientific issue.

The Tenth Circuit has also applied the harder look. In *Utahns for Better Transportation. v. U.S. Department of Transportation*,[230] the court rejected the agency's use of a model to evaluate wildlife habitat and migratory bird impacts because the model considered only habitat impacts within 1000 feet of the highway right-of-way, although the record revealed that roads could cause significant effects to birds as far as 1.24 miles from roadways.[231] In another case, the Tenth Circuit took a harder look at the groundwater modeling, transmissivity calculations, and subsurface geomorphology underlying the Department of Energy's decision to permit the Waste Isolation Pilot Project.[232] The court upheld the Department of Energy's analysis even under the harder-look review. The Tenth Circuit concluded that the Department of Energy adequately considered the possibility of radioactive material from the project escaping into the local environment via groundwater and that the agency provided "careful and reasoned" explanations for the EIS's modeling and conclusions.

## XI. Consequences of the Shift to Harder Look Review

Scientific information and data play an increasingly important role in environmental effects analyses. As information, analytic methods, and models improve, agencies can better predict the possible effects that their decisions may have on the human environment. Better data and better models, however, come at increasing costs in time and other resources for agencies, project proponents, and stakeholders. How much data is enough, and whether and which predictive model to choose, are difficult questions that require agencies to balance the utility of the information in the decisionmaking process on the one hand with the costs of obtaining the information on the other. The outcome of such inquiries is highly fact-specific and varies with the nature of the potential project and the resources it might affect. However, some basic patterns are repeated in the caselaw.

---

[230] 305 F.3d 1152 (10th Cir. 2002).

[231] *Id.* at 1180.

[232] Citizens for Alternatives to Radioactive Dumping v. U.S. Dep't of Energy, 485 F.3d 1091 (10th Cir. 2007).

In the following sections, this paper contrasts the traditional judicial standard of review with the harder-look approach in the context of the following questions.

- How much data is enough in a NEPA analysis?
- When should an agency fill apparent data gaps?
- When should an agency collect more current or arguably more representative information?
- How should an agency address opposing scientific views? And
- How should an agency choose and apply the appropriate methods and models for evaluating environmental effects?

### A. Data Sufficiency

#### 1. The Traditional Standard

Agencies have always had an affirmative duty to gather available information important to a reasoned choice among alternatives.[233] "[T]he very purpose of NEPA's requirement that an EIS be prepared for all actions that may significantly affect the environment is to obviate the need for such speculation by insuring that available data is gathered and analyzed prior to implementation of the proposed action."[234] Thus, the level of detail necessary for an EIS to be sufficient depends on the nature and scope of the proposed action.[235] But an EIS is not required "to document every particle of knowledge that an agency might compile in considering the proposed action. . . . The detail required is that which is sufficient to enable those who did not have a part in [the EIS's] compilation to understand and consider meaningfully the factors involved."[236]

#### 2. The Harder Look

Surveying existing information on possible environmental effects of a proposed action may not be sufficient where additional information is necessary to a reasoned choice among alternatives. Also, merely qualitative or conclusory descriptions of possible effects are not enough. For example, in *Neighbors of Cuddy Mountain v. U.S. Forest Service*,[237]

---

[233] Save Our Ecosystems v. Clark, 747 F.2d 1240, 1249 (9th Cir. 1984).

[234] *Id*. at 1248 (quoting Found. for N. Am. Wild Sheep v. U.S. Dep't of Agric., 681 F.2d 1172, 1179 (9th Cir. 1982) (emphasis in original quotation omitted).

[235] *See* Idaho Conservation League v. Mumma, 956 F.2d 1508, 1519 (9th Cir. 1992).

[236] Envtl. Def. Fund, Inc. v. Corps of Eng'rs, 492 F.2d 1123, 1136 (5th Cir. 1974); *see also* Citizens' Comm. to Save Our Canyons v. Tidwell, 463 F. Supp. 2d 1316, 1322 (D. Utah 2006) (Forest Service need not develop quantitative data regarding noise, number and location of backcountry users, or avalanches in evaluating effects on non-motorized users of backcountry heli-skiing operations).

[237] 137 F.3d 1372 (9th Cir. 1998)

plaintiffs sought to enjoin a timber sale on the grounds that the Forest Service failed to adequately consider the cumulative effects of three other proposed timber sales in the area on old-growth habitat for the pileated woodpecker and other old-growth dependent species. The Ninth Circuit agreed, stating that for the Forest Service to "'consider' cumulative effects, some quantified or detailed information is required."[238] In reviewing the EIS, the court found that it contained no detail regarding the extent to which the proposed sales, considered cumulatively, would impact and reduce old-growth habitat.

"Significantly, the Forest Service ha[d] failed to even mention the number or percentage of old trees meeting the definition of old growth that would be destroyed by the three other proposed timber sales," or whether the three sales would affect the same home ranges for the pileated woodpecker. Thus, given the nature of the proposed action, the court directed the Forest Service to go back and either gather such detailed information or justify why more definitive information could not be provided.[239]

In a companion case to *Neighbors of Cuddy Mountain*, the Ninth Circuit held that while an agency can rely on the reasonable opinions of its own qualified experts, there must be some hard data to support the expert's conclusions. In *Idaho Sporting Congress v. Thomas*,[240] the plaintiffs challenged the Forest Service's reliance on a 1990 report prepared by the Forest Service's hydrologist. The court concluded that the Forest Service could not rely on the expert report without disclosing to the public the data underlying the opinion. Without disclosure of the underlying data, the public would have no plausible means of challenging the agency expert's opinion, which opinion under general principles of judicial review is entitled to deference.[241]

### B. Data Gaps—Incomplete or Insufficient Information

#### 1. The Traditional Standard

NEPA imposes a duty to obtain additional data when missing information is "important," "significant," or "essential" to a reasoned

---

[238] *Id*. at 1379.

[239] *Id*. at 1380; *see also Save Our Ecosystems* , 747 F.2d at 1249 (holding that the Forest Service cannot simply rely on EPA's Federal Insecticide, Fungicide, and Rotenticide Act registration data when considering the health effects of herbicide spraying on a national forest in a programmatic EIS, but must obtain and consider additional available information).

[240] 137 F.3d 1146 (9th Cir. 1998).

[241] *Id*. at 1150. *But see* Ecology Ctr. v. U.S. Forest Serv., 451 F.3d 1183, 1188-89 (10th Cir. 2006) (holding NEPA's "hard look" standard does not equate to a "hard data" standard); *accord Citizens' Comm.*, 463 F. Supp. 2d at 1321-22.

choice among alternatives.[242] If information is incomplete, the CEQ regulations require that the agency either gather information, or discuss and justify why more definitive information relevant to reasonably foreseeable significant adverse effects in an EIS could not be provided. The agency is obligated to disclose that the information is incomplete or unavailable, discuss its relevance to the impact analysis, summarize the "credible scientific evidence" that is available, and evaluate impacts based on methods generally accepted in the scientific community.[243] The agency may proceed after identifying and considering this lack of information.[244]

Courts at times have declined to give a hyper-technical reading to the regulatory requirement for disclosure of incomplete or unavailable information.[245] For example, in *Colorado Environmental Coalition v. Dombeck*,[246] the Tenth Circuit held that the Forest Service had adequately considered available lynx data in evaluating the potential effects of a proposed ski resort expansion. Appellants had failed to show how collecting additional information was "essential" to a reasoned choice among alternatives.[247]

Further, agencies are not necessarily required to await the results of ongoing studies. Rather, the agency must weigh and consider the "alternative of delay" in order to comply with NEPA.[248] In sum, while an agency is under an obligation to identify information deficiencies in an EIS and to identify potential study needs, the agency may still proceed after identifying and considering the ramification of a lack of information.

### 2. The Harder Look

In recent cases, courts have scrutinized more closely an agency's decision to proceed in the face of incomplete or unavailable data. For example, in *National Parks & Conservation Association v. Babbitt*,[249] the National Park Service acknowledged that additional cruise ship traffic

---

[242] *Save Our Ecosystems*, 747 F.2d at 1248-49 (noting that "[f]ederal agencies routinely either do their own studies or commission studies" in preparing an EIS); *see also* Warm Springs Dam Task Force v. Gribble, 621 F.2d 1017 (9th Cir. 1980) (holding that defect in an EIS may be cured by commissioning a study regarding the effects of a discovered fault system on a proposed dam).

[243] 40 C.F.R. § 1502.22.

[244] Alaska v. Andrus, 580 F.2d 465, 473 (D.C. Cir. 1978).

[245] Colo. Envtl. Coal. v. Dombeck, 185 F.3d 1162, 1172-73 (10th Cir. 1999).

[246] 185 F.3d 1162 (10th Cir. 1999).

[247] *Id*. at 1172-72; *see also* Mayo Found. v. Surface Transp. Bd., 472 F.3d 545, 555-56 (8th Cir. 2006) (agency offered sufficient justification for declining to model air quality effects at local level).

[248] *Alaska*, 580 F.2d at 472-73.

[249] 241 F.3d 722 (9th Cir. 2001).

bringing visitors to Glacier Bay National Park in Alaska would have some effects on wildlife, but determined that the intensity of effects was unknown pending completion of studies that would be performed subsequent to, and as a result of, the agency's decision. The court held that the lack of data regarding "the practical effect of increased [cruise ship] traffic . . . undermines" the analysis.[250] Permitting the action and studying its effects later is "backwards," and "the 'hard look' must be taken before, not after, the environmentally-threatening actions are put into effect."[251]

### C. Stale Data

#### 1. The Traditional Standard

Courts have generally held that "[g]iven the role of the EIS and the narrow scope of permissible judicial review, a court 'may not rule an EIS inadequate if the agency has made an adequate compilation of relevant information, has analyzed it reasonably, has not ignored pertinent data, and has made disclosures to the public.' "[252] Courts traditionally have not faulted agencies that consider all relevant existing data when no more recent or contrary data is offered by the party challenging the agency decision.[253]

#### 2. The Harder Look

Consistent with the traditional standard, an agency cannot rely on stale or outdated data where more recent data is available to the agency. For example, in *Northwest Ecosystem Alliance v. Rey*,[254] the court held the Forest Service violated NEPA where it overlooked more recent data and relied on data from a decade when fires were less frequent to determine the number of acres to which its fire management plan would be applied.[255] But under the harder look, even if the availability of more current data is not disclosed in the record or offered by a challenger, the data used by the agency may be adjudged to be outdated. For instance, in *Lands Council v. Powell*,[256] the Ninth Circuit held that the Forest Service violated NEPA by

---

[250] *Id*. at 732

[251] *Id*. at 733.

[252] Fund for Animals v. Norton, 365 F. Supp. 2d 394, 428 (S.D.N.Y. 2005) (quoting Stewart Park & Reserve Coal., Inc. v. Slater, 352 F.3d 545, 557 (2d Cir. 2003) (in turn quoting Sierra Club v. U.S. Army Corps of Eng'rs, 701 F.2d 1011, 1029 (2d Cir. 1983))).

[253] *See*, *e.g*., *Fund for Animals v. Norton* at 433-34 (holding that Fish and Wildlife Service had compiled an adequate amount of relevant data to consider the effects of its double-crested cormorant management plan).

[254] 380 F. Supp. 2d 1175 (W.D. Wash. 2005).

[255] *Id.* at 1196.

[256] 395 F.3d 1019 (9th Cir. 2003).

relying on 13-year old fish habitat data in analyzing the effects of a proposed timber sale, even though no more recent data was available.[257]

> We do not suggest that all data relied upon by the agency be immediate, but here the [habitat] data . . . was too outdated to carry the weight assigned to it. Evidence of *current* habitat conditions, and any degradation or improvement in the last thirteen years, is relevant evidence in analyzing and determining what, if any, impact the current Project will have on the cumulative effect of current and past timber harvesting on trout habitat and on trout populations.[258]

### D. Consideration and Incorporation of Opposing Scientific Viewpoints

#### 1. The Traditional Standard

Courts are not required to "resolve disagreements among various scientists as to methodology."[259] "[A]n agency must have discretion to rely on the reasonable opinions of its own qualified experts even if . . . a court might find contrary views more persuasive."[260] In *Salmon River Concerned Citizens v. Robertson*, [261] the plaintiffs argued that the Forest Service had failed to disclose the inert ingredients, and their potential toxic and synergistic effects, in the herbicide that the Forest Service planned to apply as part of a reforestation program.[262] The court held that the Forest Service could rely on its own expert's conclusion that the risk assessment of herbicide application was adequate based on the known effects of active ingredients.[263]

In *Sierra Club v. Watkins*,[264] the court reviewed whether the Department of Energy had adequately considered opposing scientific views regarding the potential long-term effects of low-dose radiation exposure, prior to permitting transportation of spent nuclear-fuel rods. The court held that "NEPA does not require a federal agency to consider and discuss every viewpoint in the scientific community on a given matter."[265] Further, scientific studies cited by the plaintiffs did not suggest an alternative dose-conversion ratio, and those studies had been directly

---

[257] *Id.* at 1030-31.

[258] *Id.* (emphasis added).

[259] Salmon River Concerned Citizens v. Robertson, 32 F.3d 1346, 1359 (9th Cir. 1994) (quoting Friends of Endangered Species, Inc. v. Jantzen, 760 F.2d 976, 986 (9th Cir. 1985)).

[260] *Id*. (quoting *Marsh*, 490 U.S. at 378).

[261] 32 F.3d 1346 (9th Cir. 1994).

[262] *Id*. at 1358.

[263] *Id*. at 1358-59.

[264] 808 F. Supp. 852, 860-62 (D.D.C. 1991).

[265] *Id*. at 862.

refuted by other scientists. The court concluded that the Department of Energy had not erred in failing to address the studies offered by the plaintiffs.[266]

### 2. The Harder Look

An agency must address in an EIS "responsible opposing view[s]."[267] The courts are increasingly applying this requirement to mandate the agency's consideration of opposing scientific views as well. For instance, in *Center for Biological Diversity v. U.S. Forest Service*,[268] the Ninth Circuit held that the Forest Service violated NEPA by failing to address scientific opinions submitted to the agency prior to completion of the NEPA process that the northern goshawk was a habitat specialist, rather than a habitat generalist.[269] The Forest Service's experts had concluded that the goshawk was a habitat generalist and recommended that the goshawk management plan provide "a mosaic of vegetation stages . . . interspersed throughout the foraging area in small patches."[270]

The U.S. Fish and Wildlife Service and the Arizona Game and Fish Department disagreed with the Forest Service's conclusion and provided comments to the draft EIS citing scientific literature that "strongly intimates that goshawks prefer to forage in mature forests" and recommending retention of more old-growth forest.[271] Neither the agencies' comments nor Forest Service responses were included in the final EIS, and the court remanded the EIS for further analysis.[272]

## E. Modeling and Methodologies

An important corollary of whether the data contained in an EIS is of a sufficiently high quality is whether methodologies and models relied on by an agency in analyzing the potential effects of a proposed action and its alternatives are of the requisite quality. Agency models can be challenged on a number of grounds. The more complex the model, and the more inputs or assumptions it requires, the more potential sources of argument exist. Challengers routinely question the "fundamental features of the

---

[266] *Id*.

[267] 40 C.F.R. § 1502.9(b).

[268] 349 F.3d 1157 (9th Cir. 2003).

[269] *Id.* at 1169.

[270] *Id*. at 1161.

[271] *Id*. at 1163.

[272] *Id*. at 1168-69. *See also* Hughes River Watershed Conservancy v. Glickman, 81 F.3d 437, 445-46 (4th Cir. 1996); Seattle Audubon Soc'y v. Espy, 998 F.2d 699, 703-04 (9th Cir. 1993) (holding Forest Service failed to consider intervening Fish and Wildlife Service report which analyzed available spotted owl population data; the "EIS did not address in any meaningful way the various uncertainties surrounding the scientific evidence upon which the [Interagency Scientific Committee's report] rested").

agency's model, such as the model's level of abstraction from reality; the model's specific application to a subset of activities . . . or locations; and working assumptions of the model that cannot be validated."[273] A plaintiff may also challenge the data underlying the model as unrepresentative, flawed, outdated, incomplete, or insufficient for the particular application.[274] Perhaps in no other area of scientific analysis under NEPA is the shift to harder-look review more apparent than in considering an agency's modeling efforts.

### 1. The Traditional Standard

The CEQ regulations provide that an EIS must identify methodologies used and the scientific and other sources relied on for conclusions in an EIS.[275] These regulations also require federal agencies to "insure the professional integrity, including scientific integrity, of the discussions and analysis" in an EIS.[276] Nevertheless, courts have traditionally deferred to an agency's determination of the methodologies used. As the Eighth Circuit Court of Appeals stated in *Friends of the Boundary Waters Wilderness v. Dombeck*,[277] "[w]hen . . . analysis of the relevant information requires a high level of technical expertise, we must defer to the informed discretion of the responsible federal agencies."[278]

In *Friends of the Boundary Waters*, the court reviewed an EIS on a Forest Service plan restricting visitor and motorboat use in a wilderness area. Plaintiffs asserted that the Forest Service relied on flawed data because its travel-zone model relied on unverified assumptions.[279] In upholding the Forest Service's decision, the court stated that

> [i]t is not for this court to second-guess what is the best method for determining visitor satisfaction in the [Boundary Waters Canoe Area] Wilderness, nor is it this court's role to scrutinize the scientific value of the computerized model. We are satisfied that the agency followed proper procedures, accumulated data, and explained the information in ways that permitted a reasoned analysis of the evidence for all concerned.[280]

---

[273] McGarity & Wagner, *supra* n.34, at 10759.

[274] *Id*. at 10765-68; *see supra* § X.

[275] 40 C.F.R. § 1502.24.

[276] *Id*.

[277] 164 F.3d 1115 (8th Cir. 1999).

[278] *Id.* at 1128.

[279] *Id.* at 1129.

[280] *Id.* at 1130.

In another instance, the court upheld a Forest Service model of habitat capabilities that was challenged for failure to account for site-specific landscape features such as altitude, topography, and other variables.[281]

> As long as an agency reveals the data and assumptions upon which a computer model is based, allows and considers public comment on the use or results of the model, and ensures that the ultimate decision rests with the agency, not the computer model, then the agency use of a computer model to assist in decision making is not arbitrary and capricious.[282]

The Forest Service had adequately disclosed the model's shortcoming—the inability to account for spatial distribution of habitats, differences in the composition of understory vegetation, effects of topography, and effects of animal competition for cover or space—and applied its own interpretative analysis to the model rather than relying on it to dictate the agency's decision.[283]

### 2. The Harder Look

Though agencies need not use the best scientific methodology, NEPA requires the "up-front disclosures of relevant shortcomings in the data or models." [284] Thus, in *Lands Council v. Powell*, the court reversed the Forest Service's decision approving a watershed restoration and timber harvest project because the agency failed to disclose that its WATSED (Water and Sediment Yields) model, used to estimate sedimentation from the proposed project, did not include relevant variables.[285] In *Natural Resources Defense Council v. United States Forest Service*,[286] the Forest Service had prepared an EIS on revisions to the Tongass Land Management Plan which determined how much timber in the forest should be available for harvest. The court held that the economic effects analysis of the proposed revisions was inadequate because it was based on faulty

---

[281] Sierra Club v. U.S. Forest Serv., 878 F. Supp. 1295, 1310 (D.S.D. 1993), *aff'd*, 46 F.3d 835 (8th Cir. 1995)

[282] *Id*.

[283] *Id*. at 1309-10; *see also* Tex. Comm. on Nat. Resources v. Van Winkle, 197 F. Supp. 2d 586, 603 (N.D. Tex. 2002). In *Van Winkle*, the court recognized that its review of an agency's selection of and methodology for a computer model is deferential, so long as the agency's "implementation of [its] methodology had a rational basis that was consistently applied." *Id.* at 599. After reviewing the EIS and the administrative record, the court held that the EIS adequately discussed the reasons for the projected increase in flood deviations, including why changes were made to the model and how it was calibrated.

[284] Lands Council v. Powell, 395 F.3d 1019, 1032 (9th Cir. 2005) (*citing* 40 C.F.R. § 1502.22).

[285] *Id*.

[286] 421 F.3d 797, 811-12 (9th Cir. 2005).

timber demand forecasts.[287] The Forest Service's mistaken assumptions led to a nearly doubled demand forecast and a much bleaker picture of economic effects if the project did not proceed.[288] The court held that "[i]naccurate economic information may defeat the purpose of an EIS by 'impairing the agency's consideration of the adverse environmental effects' and by 'skewing the public's evaluation' of the proposed action."[289] In this case, the market demand error was "sufficiently significant that it subverted NEPA's purpose."[290]

## XII. What Factors Underlie the Harder Look?

The federal courts have long signaled a willingness to inquire into—and set aside as inadequate under NEPA—the assumptions, methodologies, and data used by federal agencies in NEPA documents.[291] The development of the harder-look review is consistent with the longstanding duality of process/substance review of agency decisionmaking.[292] "[P]rocess values still undergird and inform substantive 'hard look' review in important and varied ways, to a degree that federal courts generally have failed to acknowledge or explain. . . . An agency that ignores process values invites presumably unwanted judicial scrutiny."[293] Moreover, the "difficulties of asking generalist judges to review difficult scientific, mathematical, or technical materials are real ones that deserve continuing attention."[294]

Part of the shift toward harder-look review may be due to the positive feedback loop engendered by the courts' earlier decisions. For instance, in *Neighbors of Cuddy Mountain* and *Idaho Sporting Congress*, the courts required agencies to provide detailed and quantified information and the underlying data on which the agency's EIS conclusions were based. As a result of these and other decisions, agencies are required to provide more detailed information supporting the assessment of potential environmental effects, and provide up-front disclosures of the limitations and assumptions underlying their modeling and computational efforts. Making this

---

[287] *Id*. at 802.

[288] *Id*. at 812-13.

[289] *Id*. at 811 (quoting *Hughes River*, 81 F.3d at 446-48).

[290] *Id*. at 812.

[291] *See, e.g.*, *Block*, 690 F.2d at 763-65; La. Wildlife Fed'n v. York, 761 F.2d, 1044, 1052-54 (5th Cir. 1985); *see also Ctr. for Biological Diversity*, 349 F.3d at 1167, 1169 (citing *Block*, 690 F.2d at 773); *NRDC v. U.S. Forest Serv.*, 421 F.3d at 814.

[292] *See* Ronald J. Krotoszynski, Jr., " 'History Belongs to the Winners': The Bazelon-Leventhal Debate and the Continuing Relevance of the Process/Substance Dichotomy in Judicial Review of Agency Action," 58 *Admin. L. Rev.* 995, 998 (2006).

[293] *Id.*

[294] *Id*. at 1015.

information available in the administrative record for the agency's NEPA decision and allowing for public and expert agency review of these materials during the NEPA process can produce a more thorough and informed set of EIS comments that in turn must be considered and addressed in the final NEPA document. Thus, the requirements for information and data disclosure have made more information and technical data available to NEPA document reviewers and commenters, enabling them to provide more sophisticated comments that, while based on NEPA's procedural requirements, may also implicate the substance of the agency's determinations and use of scientific and technical information.

Also, as experienced practitioners know, the caselaw is fragmented with highly fact-driven and program- and site-specific decisions.[295] It can be difficult to reconcile all of the federal court NEPA decisions on any given topic. To this mélange, the fact that science itself is not static, but instead continues to evolve as new theories and methodologies are tested and adopted and older ones discarded,[296] seems inevitably to suggest that the actions necessary to comply with NEPA's directives concerning the use of science to forecast likely environmental impacts also are not static but will likewise continue to evolve.

As the frontiers of science advance, the judiciary's need to balance its role as reviewer of agency action in the face of ever-more complex scientific analyses will only continue. The intersection between the evolution in scientific knowledge and tools on the one hand, and the courts' struggles to discharge their responsibilities in reviewing the actions of agencies with greater technical expertise and data analysis resources than those available to judges and legal practitioners on the other, will continue to pose both a challenge to the authors of NEPA documents and fruitful ground for NEPA litigants.

## XIII. Conclusions and Recommendations

Litigation arguments regarding—or even conclusory judicial statements about—"deference" to an agency's NEPA decisionmaking on scientific or technical issues oversimplify the complex balancing and

---

[295] *See* Mattix & Becker, *supra* n.3, at 1155 ("it is clear that agencies have little, and varied, guidance from the courts when dealing with scientific uncertainty" under NEPA).

[296] *Id*. at 1141 ("[s]cience almost never provides final answers" but is a tool for reasoned decisionmaking about possible environmental consequences); Michael J. Brennan et al., "Square Pegs and Round Holes: Application of the 'Best Scientific Data Available Standard in the Endangered Species Act,' " 16 *Tulane Envtl. L. J.* 387, 393 (2003) ("A prevailing [scientific] paradigm extends over time, informing and being informed by the experiments in which it is involved and by new knowledge learned. Sometimes the paradigm grows and flourishes and sometimes it is replaced by something revolutionary.") (citing Thomas Kuhn, *The Structure of Scientific Revolutions* (3d ed. 1996)).

inquiries which courts are directed to undertake in reviewing both the process and substantive issues inherent in evaluating agency use of scientific and technical information under NEPA. A reviewing court at best must struggle to comprehend the agencies' assessments and conclusions regarding environmental effects and to judge their compliance with NEPA in light of the rule of reason, hard look, and arbitrary or capricious formulations of the standard of review. Where agency NEPA documents are inartfully drawn, incomplete, or otherwise lacking in clarity and comprehensibility, a reviewing court may have little choice but to delve more deeply into the substantive subject matter underlying agency conclusions in an attempt to discern whether, or to what degree, the agency has failed to meet those standards. At the least, less clearly drafted and supported NEPA documents will offer an invitation to conscientious judges to venture into the realm of agency expertise in an effort diligently to review agency action and ensure the agency's implementation of NEPA's twin goals of informed decisionmaking and informed public disclosure.

As the law of NEPA continues to evolve, and agency reliance upon more complex and technical scientific methodologies and information in natural resource management and decisionmaking continues to grow, federal agencies, NEPA practitioners, and stakeholders must recognize and adapt to the shifting standards for scientific information and analysis under NEPA. In particular, those charged with the development and use of NEPA documents need to ensure that the use of scientific information and analyses in NEPA documentation is clear, transparent, and understandable to both the lay public and the lay judiciary. Accomplishing this requires careful attention to:

(1) using the most up-to-date information available;

(2) identifying limitations in models, methodologies, and information and disclosing them in the NEPA document;

(3) where multiple and conflicting data sets, models, or other methodologies for impact assessment exist, comparing and contrasting their strengths and weaknesses, and explaining in the NEPA document the basis for selecting one data set or methodology over another, or for considering multiple methods and data sets in the analysis;

(4) considering and addressing responsible opposing scientific views; and

(5) where data gaps exist, either filling the gaps or explaining why doing so would be too costly or infeasible.

These and related efforts will produce improved environmental analyses and NEPA documents, and ultimately better agency decisions,

thus meeting the underlying goals of the NEPA process. Greater awareness of the types of impact assessment and scientific issues being encountered by the agencies and reviewed by the courts can enable NEPA practitioners, agencies, and stakeholders to ensure that NEPA's requirements for high-quality information and accurate scientific analysis are met.