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Subject: Comments on Revision of the Chugach National Forest Land and Resource
Management Plan

The Institute for Policy Integrity respectfully submits this comment on the revision of the Chugach National Forest Land and Resource Management Plan. The Institute for Policy Integrity at New York University School of Law is a non-partisan think tank dedicated to improving the quality of decisionmaking through advocacy and scholarship in the fields of administrative law, cost-benefit analysis, and public policy.

Planning staff for the Chugach have begun to solicit input from a broad range of stakeholders for the Plan revision, which will ensure a comprehensive and well-informed planning process. Historically, National Forests have used cost-benefit analysis or economic efficiency analysis when revising Plans, as required by the 1982 Planning Rule. The Forest Service's Planning Rule update last year removed the requirement to calculate the net present value of each management alternative considered. However, the Planning Rule also reserved broad discretion for local and regional planners to decide which analyses to make use of when revising their forest plans. Cost-benefit analysis is a powerful tool that can help the Forest Service to achieve its multiple-use mandate and to balance competing uses of scarce forest resources. Moreover, cost-benefit analysis is accepted federal practice, and is consistent with the Forest Service's emphasis on adaptive management and outcome-based planning. Because planners collect much of the data required for cost-benefit analysis regardless of which analytical methods they use, and because planners can rely on existing valuation methods and models, the analysis itself does not add an insurmountable time or cost burden to the planning process. To the extent feasible, the Chugach National Forest should use cost-benefit analysis in assessing the available alternatives in revising its Land and Resources Management Plan.

I. Forest Service Guiding Principles and Statutory Mandates Support the Use of Cost-Benefit Analysis in Planning

Guiding Principles

From its inception in 1897, the Forest Service has worked toward a mandate of managing designated public lands and securing a reliable supply of timber to the American economy.¹ Yet even early on, the Forest Service embraced utilitarian principles of ensuring "the greatest good of the greatest number in the long run" whenever it was faced with a choice between competing uses of scarce resources.² This "wise use" policy dictated not only that the Forest Service would consider

¹ Forest Service Organic Administration Act of 1897, 30 Stat. 35 (codified as amended at 16 U.S.C. §§ 473–478, 479–482, 551 (2006)).

² Letter from Sec'y Ag. James Wilson, to Chief Forester Gifford Pinchot (Feb. 1, 1905), *available at* http://www.foresthistory.org/ASPNET/policy/Agency_Organization/Wilson_letter.pdf.

the implications of its timber operations on long-run forest health and timber supply, but also that it would consider alternative uses such as ranching, irrigation, mining, and even non-use.³ This foundation, along with legislation and regulations promulgated over the past half century, has established a deep tradition of using cost-benefit analysis and other empirically-grounded practices to guide Forest Service decisions. In 1960, Congress passed the Multiple-Use Sustained-Yield Act (MUSYA), which broadened the Forest Service’s statutory mandate to optimize planning around outputs other than timber and water, including “outdoor recreation, range, timber, watershed, and wildlife and fish purposes.”⁴

Statutory Framework

Section 2 of MUSYA requires the Secretary of Agriculture “to develop and administer the renewable surface resources of the national forests for multiple use and sustained yield of the several products and services obtained therefrom. In the administration of the national forests due consideration shall be given to the relative values of the various resources in particular areas.” Section 4 of the Act defines multiple use to require “[t]he management of all the various renewable surface resources of the national forests so that they are utilized in *the combination that will best meet the needs of the American people*.”⁵ Because it allows planners to compare social goods as diverse as timber, recreation, and wildlife habitat in like terms, continued use of cost-benefit analysis is the best way for the Forest Service to fulfill this mandate.

The 2012 National Forest Planning Rule

In April 2012, the Forest Service promulgated a revision to the National Forest System Land Management Planning Rule (“new Rule” or “2012 Rule”).⁶ The new Rule will serve as the central framework for each Forest unit’s individual plan updates. It is meant to represent a paradigm shift: replacing inflexible, lengthy front-end analysis with an adaptive management process focused on collaboration and ecosystem restoration.⁷ The Agency’s responses to public comments on the rule reflect concerns that cost-benefit analysis—and other measures of economic efficiency—played a role in bogging down the old planning process.⁸ The 2012 Rule also removes its predecessor’s requirement that plans “maximize net public benefit.”⁹ However, the Rule does not foreclose the use of empirically-grounded cost-benefit analysis in planning; it merely makes its use optional where it was once mandatory. The Rule preserves planners’ discretion to use these or other analytical tools in selecting a management approach.¹⁰ Omitting such analyses would leave USFS decisions open to legal challenge, and would mean forgoing the considerable assistance they can provide in meeting the Rule’s goals.

³ U.S. Forest Serv., *Pinchot and Utilitarianism*, FOREST SERVICE: THE GREATEST GOOD (last visited Dec. 5, 2012) <http://www.fs.fed.us/greatestgood/press/mediakit/facts/pinchot.shtml>.

⁴ Multiple Use Sustained Yield Act, Pub. L. No. 86-517, 74 Stat. 215, 215 (1960) (codified as amended at 16 U.S.C. §§ 528-531 (2006)).

⁵ 16 U.S.C. § 531(a) (emphasis added).

⁶ National Forest System Land Management Planning Rule, 77 Fed. Reg. 21,162 (Apr. 9, 2012) (codified at 36 C.F.R. § 219 (2012)).

⁷ *See id.* (describing the new Rule’s goals).

⁸ *See id.* at 21,186 (stating that the removal of certain procedural requirements under the new Rule will make planning more efficient, and listing present net value analysis and comparison of the final plan to the net-benefit maximizing alternative among the removed procedures); *see also id.* at 21,187 (“The Department believes the focus should be on collaboration, science, and sustainability, rather than the extensive analysis that was done under the 1982 rule procedures.”).

⁹ *See id.* at 21,187 (responding to a commenter who requested that the language be put back into the rule).

¹⁰ *Id.* (“Analyses will in no way be eliminated or discouraged during the planning process under this new rule.”).

The 2012 Rule Does Not Foreclose the Use of Cost-Benefit Analysis in Planning

Beyond explicitly stating that analysis would “in no way be eliminated or discouraged . . . under this new rule,” USFS acknowledged that “such an analysis (quantitative and/or qualitative) may be useful in some cases to . . . demonstrate fulfillment of MUSYA goals.”¹¹ Further, while declining to include specific guidance in the Rule itself, the Forest Service noted that including information on the use and methodology of net present value or cost-benefit analysis in the Agency’s Directives would be appropriate.¹² Such directives were recently proposed, and the initial drafts grant planners discretion to choose appropriate methodologies and requires them to consider environmental, economic, social, and cultural impacts.¹³ That these initial drafts do not yet offer more specific guidance on net present value or cost-benefit analysis should not discourage Chugach planners from making use of these methodologies to ensure that their decisions in the upcoming plan revision best meet the public’s needs.

Using cost-benefit analysis in regulatory and management actions is accepted federal agency practice. As stated in White House guidance to agencies on rulemaking, comparison of alternatives in monetary terms “is useful information for decision-makers and the public to receive, even when economic efficiency is not the only or the overriding public policy objective.”¹⁴

II. Chugach Staff Should Use Cost-Benefit Analysis in Revising its LRMP

Using Cost-Benefit Analysis Will Assist the Forest in Realizing the 2012 Rule’s Goals

The Forest Service has expressed several goals for the 2012 Planning Rule. Among these is a major shift in management approaches: from a more rigid, prospective method to one based on adaptive management strategies.¹⁵ As the Agency has explained, this will allow managers to respond to changing environmental conditions, and will reduce the time and costs associated with planning.¹⁶ The 2012 Rule also strongly emphasizes collaboration, sustainability, and the use of the best available science to inform decisionmaking.¹⁷

In its responses to public comments on the 2012 Rule, the Forest Service alluded to incongruities between these goals and the use of cost-benefit analysis (or similar decisionmaking tools). The Service’s responses indicate that the old emphasis on “front-end” analysis is incompatible with the new adaptive management approach.¹⁸ They also draw a distinction between relying on those analyses and effectively incorporating “collaboration and science.”¹⁹ If these responses reflect a

¹¹ *Id.*

¹² *Id.* at 21,188.

¹³ U.S. Forest Serv., National Forest System Land Management Planning Directives (proposed Feb. 27, 2013).

¹⁴ White House Office of Mgmt & Budget, *Circular A-4* at 2 (2003) [hereinafter OMB Circular A-4].

¹⁵ See U.S. Forest Serv., FAQs on Final Planning Rule (last visited Nov. 6, 2012)

<http://www.fs.usda.gov/detail/planningrule/faqs#10> (answering the question “How is the final planning rule different from the 1982 rule procedures?”).

¹⁶ See *id.* (“Under the final planning rule, the Forest Service should complete plan revisions more quickly at reduced cost, while using current science, collaboration, and an all-lands approach to produce better outcomes for people and the environment.”).

¹⁷ See *id.*

¹⁸ See 77 Fed. Reg. at 21,164 (“[T]he 1982 rule procedures are not current with regard to science, knowledge of the environment, practices for planning and adaptive management, or social values, and are also too complex, costly, lengthy, and cumbersome.”).

¹⁹ See *id.* at 21,187 (conflating the “[t]he Department[’s choice] to emphasize a rule that supports ecological, social, and economic sustainability as the primary goal for management of NFS lands” with the fact that “[t]he final rule does not include requirements to demonstrate that plans will maximize net public benefits or require valuation of economic efficiency or require present net value analysis as the 1982 rule did”).

view that using cost-benefit analysis will cause planners to stray from the new Rule's goals, they overlook the potential of cost-benefit analysis to facilitate adaptation and collaboration. Insofar as this was not the Agency's intention—for example, if the Agency intended instead to encourage the use of multi-criteria decision analysis or to grant the greatest possible degree of analytical flexibility to its decisionmakers—then this view warrants clarification.²⁰ In either case, Chugach forest planners should make use of cost-benefit analysis as they go about revising the Chugach forest plan.

Cost-Benefit Analysis and Adaptive Management

Adaptive management is an acknowledgement of the uncertainties intrinsic to resource management.²¹ It requires managers to address knowledge gaps by dynamically tracking certain outcomes.²² Where those outcomes reveal a fault in some assumption underlying a decision, the planner must revisit that decision and adjust course accordingly.²³

Cost-benefit analysis is not at odds with adaptive approaches: the two techniques reflect different processes. Cost-benefit analysis is a tool that can inform decisionmaking. It seeks to assess which among a set of alternatives will maximize net benefits.²⁴ In contrast, adaptive management encompasses more than one decision. It refers to a framework for establishing and monitoring the achievement of various objectives. The two are synergistic. By providing a structured way to evaluate and to revisit decision inputs, cost-benefit analysis can make adaptive management efforts more effective.²⁵

Performing a full cost-benefit analysis requires planners to systematically set out the assumptions underlying each alternative. This process can inform key decisions on how to conduct an adaptive program. Indeed, even determining whether adaptive management is appropriate—that is, whether learning is both necessary and feasible²⁶—requires that planners identify key uncertainties. The process of systematically estimating a plan's effects should help clarify any knowledge gaps. For example, in attempting to describe the benefits of a new logging method, an analyst might note a lack of information as to its tendency to impact the spread of fire.

Similarly, when the decision is made to test an assumption, specific triggers must be established that will signal the need for plan revision or other corrective action.²⁷ Those values could be

²⁰ As discussed below, failing to adequately make use of certain analyses using this discretion invites legal challenge to decisions made under the new rule's aegis.

²¹ See Igor Linkov et al., *From Comparative Risk Assessment to Multi-Criteria Decision Analysis and Adaptive Management: Recent Developments and Applications*, 32 ENV'T INT'L 1072, 1073(2006) ("Adaptive management explicitly acknowledges the uncertainty in managers' knowledge of a system.").

²² See *id.* (describing how adaptive management addresses uncertainty).

²³ Bruce G. Marcot et al., *Recent Advances in Applying Decision Science to Managing National Forests*, 285 FOREST ECOLOGY & MGMT. 123, 128 (2012) (explaining how managers can respond to the results of monitoring).

²⁴ Daniel H. Cole, *Regulatory Cost-Benefit Analysis and Collective Action*, 3 (Inst. for Policy Integrity, Working Paper No. 2009/1), available at <http://policyintegrity.org/publications/detail/regulatory-cost-benefit-analysis-and-collective-action/> (describing the process of conducting a cost-benefit analysis).

²⁵ For a discussion of the ways in which adaptive management can lead to inefficiency and complicate planning, see Holly Doremus, *Adaptive Management As an Information Problem*, 89 N.C. L. REV. 1455, 1460 (2011) ("Adaptive management increases the costs of management, complicates oversight, imposes added institutional demands, and is subject to misuse for political ends.").

²⁶ See *id.* at 1466 ("[A]daptive management should be considered only if, at a minimum, three conditions are met: there must be information gaps; learning must be feasible; and there must be opportunities for adjustment.").

²⁷ See generally MARTIN NIE & COURTNEY SCHULTZ, *DECISION MAKING TRIGGERS IN ADAPTIVE MANAGEMENT*, REPORT TO USDA PACIFIC NORTHWEST RESEARCH STATION: NEPA FOR THE 21ST CENTURY (Nov. 1, 2011) (emphasizing the necessity of clearly defined triggers to successful use of adaptive management).

derived from the same predictive models used to establish expected benefits or costs. To continue the previous example: a manager might choose to account for the unknown impact of a new logging method on fires by assuming the result would mirror those of known harvesting methods. This would be reflected in the original analysis. If she found this assumption uncertain enough to warrant monitoring, the trigger to revisit the assumption would be obvious: a substantial variation from the predicted value that was selected for the purposes of the first analysis.

That this information could be determined without performing a full cost-benefit analysis does not place the two endeavors at odds, and combining the two may prove a more efficient use of analytic resources.

Even if a planner chose to decide which outcomes to track—and how—more informally, there would still be advantages to using cost-benefit analysis to decide which initial course of action to adopt. The systematic valuation and quantification required when conducting a full cost-benefit analysis not only allows simplified comparison of proposed alternatives,²⁸ but also makes the assumptions and uncertainties inherent in that prioritization easier to evaluate and revisit over time.

Performing a full cost-benefit analysis creates a record of the assumptions planners used in their decisions, which will facilitate later revisions to the initial plan. Adaptive management requires repeated decisionmaking on forest management practices. Performing cost-benefit analyses to inform those decisions need not make them more onerous. Rather, establishing a basic framework and then updating that model based on observed deviations from expected outcomes, gives planners two major advantages. First, it provides a ready way to evaluate the alternatives at each new decision point. Second, and more powerfully, it can help forest managers ground their decisions to update plans in data. Were the earlier decision less clearly documented and supported by data and analysis, it would be more difficult to refer to that decision in explaining a change in strategy—which could in turn make that change appear arbitrary. In this way, cost-benefit analysis addresses concerns that adaptive management may be used as a way to flout statutory requirements, or to generally over-extend planning discretion.²⁹

Cost-Benefit Analysis and Collaboration

Cost-benefit analysis can promote effective collaboration³⁰ by making the decisionmaking process transparent, and by providing a common, neutral language through which stakeholders can evaluate and respond to proposed actions.

Cost-benefit analysis is a tool to inform, not to make, decisions.³¹ It does not wed decisionmakers to any particular alternative. However, by clearly outlining the factors relevant to a decision, and

²⁸ Jiunn-rong Yeh, *Changing Faces of Cost-Benefit Analysis: Alternative Institutional Settings and Varied Social and Political Contexts*, in *THE GLOBALIZATION OF COST-BENEFIT ANALYSIS IN ENVIRONMENTAL POLICY* at 92 (2013) (Michael A. Livermore & Richard L. Revesz, eds.) (describing how cost-benefit analysis can be used to inform the decisions of executive and legislative bodies, and of the general public).

²⁹ See HOLLY DOREMUS ET AL., *CTR. FOR PROGRESSIVE REFORM, WHITE PAPER NO. 1104, MAKING GOOD USE OF ADAPTIVE MANAGEMENT* (2011) (“Many environmentalists argue that adaptive management places too much open-ended discretion in the hands of agency managers, reducing accountability and exposing environmental values to the risks of agency capture and bureaucratic inertia.”).

³⁰ Under the new Rule, “collaboration” refers to “[a] structured manner in which a collection of people with diverse interests share knowledge, ideas, and resources while working together in an inclusive and cooperative manner toward a common purpose.” 36 C.F.R. §219.19.

³¹ See Michael A. Livermore, *Can Cost-Benefit Analysis of Environmental Policy Go Global?*, 19 N.Y.U. ENVTL. L.J. 146, 154 (2011) (describing cost-benefit analysis as “a systematic mechanism to pull together information about a policy choice and compare alternatives.”).

by calling attention to gaps between a decision and underlying data, cost-benefit analysis facilitates understanding of and responses to a proposed action.³²

This transparency is crucial to decisionmaking in contexts as laden with values tradeoffs as forest planning,³³ where it is often difficult for planners to make purely objective decisions.³⁴ Formalized analysis can mitigate the impact of value judgments by facilitating outside review of planners' decisions and assumption.³⁵ Transparency can prevent the interests of one group from disproportionately controlling the decision process, and is particularly important in the forest planning context.³⁶ Planning decisions are meant to reflect the interests of the entire nation—not those of a single powerful industry or organized group. Insofar as these value judgments also have a scientific component, transparency has the added benefit of encouraging the kind of interaction between planners and scientists envisioned by the new Rule.³⁷

Further, cost-benefit analysis presents a neutral way to compare a set of alternatives. By making use of a neutral decision language, cost-benefit analysis helps avoid moral attacks or inflammatory language that could undermine collaborative relationships.³⁸ Thus, while formalized analysis may open decisionmakers to criticism from some quarters, it can also help limit purely political opposition.³⁹

Tailoring the analyses' presentation to a lay audience can make cost-benefit analyses' common language even more valuable. Cost-benefit analysis is a flexible tool: it can be altered to fit into different decision contexts and to promote understanding by varied parties, including the general public.⁴⁰ This tailoring can be accomplished in several ways. As one example, rather than reporting their results as point estimates, planners could focus on order-of-magnitude judgments—that is, whether benefits are likely to outweigh costs, and their degree of confidence in that conclusion.⁴¹ By plainly reporting whether an alternative is efficient, and what would have to change to reverse

³² See *id.* (“Cost-benefit analysis improves transparency by making the decision making process explicit, requiring decision makers to report their data, assumptions, and expectations, and subjecting analysis to outside scrutiny and criticism by experts.”).

³³ See 16 U.S.C. §531. See also Livermore, *supra* note 31, at 155 (“[S]cholars, political commentators, and civil society actors can review and criticize cost-benefit analysis in a way that is simply impossible when decisions are made behind closed doors.”).

³⁴ See Cole, *supra* note 24, at 9 (“Decision makers simply cannot avoid making choices based on subjective valuations.”).

³⁵ See *id.* at (noting that in light of the necessarily subjective aspect of decisionmaking, “in absence of some formalized decision making process such as RCBA, those assumptions and valuations are likely to remain unspecified and opaque, making it more difficult, if not impossible, for other analysts to review, criticize or replicate analysis.”)

³⁶ See Livermore, *supra* note 31, at 180 (explaining that cost-benefit analysis supports rational decision making by “aggregating available information, identifying goals, quantifying uncertainty, and helping political actors make choices that best achieves their goals with the fewest negative consequences”).

³⁷ See 36 C.F.R. § 219.3.

³⁸ See Livermore, *supra* note 31, at 155 (“[C]ost-benefit analysis casts criticism in a technocratic language that may be less threatening to powerful political actors . . . [it] applies a neutral and universal standard, drawing attention to inefficient programs without resorting to inflammatory political or moral attacks.”).

³⁹ See Cole, *supra* note 24, at 12 (positing that EPA’s use of RCBA helped it avoid challenges to its revision of the NAAQS on economic grounds, and may have ultimately ensured the rule’s acceptance).

⁴⁰ See Yeh, *supra* note 28, at 87 (noting that when used to inform citizens who were going to vote on a given policy, cost-benefit analysis had to “become less technical and more accessible; the costs and benefits of any policy under consideration . . . presented in ways that speak directly to the public rather than to political elites. . . . [A]ll of the pros and cons should be presented in simple language.”).

⁴¹ See Nathaniel O. Keohane, *The Technocratic and Democratic Functions of the CAIR Regulatory Analysis*, in REFORMING REGULATORY IMPACT ANALYSIS 33, 48 (Winston Harrington et al., eds., 2009) (describing the implications of construing regulatory impact analysis, a form of cost-benefit analysis, as serving not only a technocratic, but a public informing purpose).

that conclusion, planners can both make their reports less overwhelming, and draw attention to the most relevant points of uncertainty.⁴² Or, where possible, a decision's consequences could be presented not only in monetary terms, but through physical analogs that make it easier for the reader to relate those consequences to her everyday life and preferences.⁴³ Consider the following example, drawn from the context of air pollution regulation, which outlines how a report could describe a reduction in mortality risk:

This proposed regulation is estimated to cost roughly \$2 billion annually and to prevent 13,000 premature deaths each year. The implied cost per avoided premature death is therefore \$150,000. If one were to apply this same trade-off to other, more familiar decisions, it would be equivalent to an individual paying \$15 per year to reduce his or her annual risk of dying by 1 in 10,000—equivalent to the risk from [smoking X cigarettes per day], [rock climbing at X elevation], and so on.⁴⁴

By presenting their analysis in a format that mirrors everyday decisionmaking, planners can encourage public comprehension, involvement in, and ultimately support for their planning decisions. This open presentation will benefit both the public and decisionmakers.

Making Use of Cost-Benefit Analysis in Planning Will Help Planners Avoid Legal Challenges

Forest Service planning actions are frequently subject to legal challenge, which adds significant cost and delay to the planning process. Cost-benefit analysis can provide a buffer against allegations that planning actions are outside of the planner's statutory authority, or that they are arbitrary and capricious.⁴⁵

The 2012 Rule has already become the subject of litigation.⁴⁶ While the current challenge does not directly relate to the use of economic planning tools, it questions whether the Forest Service has accurately accounted for the requirements of MUSYA. Transparent analysis may help protect the Rule from further challenges by showing how USFS meets the statutory requirement that it weigh competing forest uses in its decision-making. The preamble of the new Rule explicitly acknowledges this point, stating:

Cost-benefit analyses . . . are not required when evaluating plan alternatives; however, such an analysis . . . may be useful in some cases to satisfy the NEPA objectives (42 U.S.C. Sec 4331, 101 and 102(2)) and to demonstrate fulfillment of MUSYA goals (for example, "management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people;" (16 U.S.C. 531(a))).⁴⁷

As the Rule notes, cost-benefit analysis can also assist in meeting the requirements of the National Environmental Policy Act (NEPA). NEPA directs that where an environmental impact statement is required it "should at least indicate those considerations, including factors not related to environmental quality, which are likely to be relevant and important to a decision."⁴⁸ While

⁴² See *id.* at 49.

⁴³ See *id.* at 50.

⁴⁴ *Id.* at 51.

⁴⁵ See Nie & Schultz, *supra* note 27 at 11 (describing the tension inherent in adaptive management processes between permitting actors to make decisions with full discretion and ensuring they are accountable for those decisions).

⁴⁶ Complaint, Federal Forest Resource Coalition v. Vilsack, No. 12-1333, 2012 WL 3281587 (D.D.C.) (Aug. 13, 2012).

⁴⁷ 77 Fed. Reg. at 21,188.

⁴⁸ 40 C.F.R. § 1502.23.

cost-benefit analysis is not necessary to meet that requirement,⁴⁹ when conducted systematically its use can demonstrate that the agency gave due consideration to all relevant decision factors.⁵⁰

Further, cost-benefit analysis may help the Forest Service preempt challenges to its use of adaptive management. As noted above, adaptive management requires repeated decisionmaking. If each decision were subject to legal challenge, rapid changes in plans would become impossible—thereby undermining those decisions’ very purpose.⁵¹ Planners could reduce the likelihood of such a logjam occurring by systematically stating their assumptions in published analyses.

III. Cost-Benefit Analysis Amid Uncertainty in the Planning Process

Because forest planning requires forecasting outcomes of various management alternatives across a variety of dimensions—many of which include non-market values such as ecosystem services—planners will often have to work under considerable uncertainty. Uncertainties can pertain to parameter values, overall model structure, definition of terms, and functional relationships among variables, and can arise from sampling error, limited knowledge of the system, imprecise language, variable expert judgment, and other sources.⁵² Many methodological approaches exist to assist planners in addressing these challenges.

The Forest last revised its Land and Resource Management Plan in 2002, under the framework set by the 1982 Planning Rule. As part of the Environmental Impact Statement and Record of Decision accompanying its plan revision, planners calculated the net present value (NPV) of net timber revenues, using a four percent discount rate and accounting for logging costs, as well as marketing, program administration, road maintenance, reforestation, and other program costs. However, the Forest did not attempt to quantify the NPV for non-timber forest outputs (recreation, commercial fishing, mining) and for non-use values (such as ‘existence values’), citing inadequate methodologies and data.⁵³ The science of estimating outcomes and values for these resources continues to evolve, and planning staff should attempt to include as much information on these variables as possible in their upcoming plan revision.

Even where values are difficult to monetize, the Forest should continue to report and consider the net present value of as many benefits and costs as are feasible to quantify. These values can be considered alongside qualitative values when making final decisions. In the past, Chugach staff have expressed concerns that providing NPV estimates of non-use values and other variables that are difficult to quantify could present a “false sense of accuracy.”⁵⁴ These are valid concerns. However, planning staff can avoid such issues by using quantitative analysis to the extent feasible and highlighting any areas where the literature provides a particularly wide range of values, or where they otherwise have a reason to suspect inaccuracies in certain data, models, or estimates.

Such an approach has worked well in the past. For example, in its last plan revision, Inyo National

⁴⁹ See *Trout Unlimited v. Morton*, 509 F.2d 1276, 1286 (9th Cir. 1974) (holding that “under the circumstances of this case the absence of [cost-benefit] analysis in the EIS is not fatal. The EIS before us is sufficiently detailed to aid the decision-makers in deciding whether to proceed or not and to provide the information the public needs.”).

⁵⁰ See, e.g., *Sierra Club v. Sigler*, 695 F.2d 957, 977 n. 15 (5th Cir. 1983).

⁵¹ See J.B. Ruhl & Robert L. Fischmann, *Adaptive Management in the Courts*, 95 MINN. L. REV. 424, 462 (2010) (describing possible challenges to adaptive management planning approaches, and noting that “[p]romises to plan, collaborate, or manage toward compliance should environmental conditions degrade below the substantive management criterion are insufficient to survive judicial review.”).

⁵² Marcot, *supra* note 23, at 127.

⁵³ U.S. FOREST SERV., FINAL ENVIRONMENTAL IMPACT STATEMENT, CHUGACH NATIONAL FOREST LAND MANAGEMENT PLAN REVISION 3-553 (2008).

⁵⁴ U.S. FOREST SERV., RECORD OF DECISION FOR FINAL ENVIRONMENTAL IMPACT STATEMENT, REVISED LAND AND RESOURCE MANAGEMENT PLAN, CHUGACH NATIONAL FOREST 35 (2002).

Forest calculated NPV estimates for many plan inputs. Recognizing that its model could not account for the high values that users place on difficult-to-monetize, non-market resources, Inyo selected their Preferred Alternative over the Cost-Efficient Alternative.⁵⁵ Having included in its analysis such non-market outputs as “scenic quality, dispersed recreation opportunities, fish and wildlife, and wilderness,” alongside market outputs such as energy, water supply, timber, and developed recreation, Inyo decided that its Preferred Alternative maximized net benefits.

The Tongass National Forest also effectively used a combination of qualitative and cost-benefit analyses in its recent plan revision. In analyzing its alternatives, it monetized certain revenue and cost streams such as timber sales, recreation and tourism, and program administration costs. Other values were difficult to monetize (e.g., commercial fishing and subsistence) or quantify (e.g., ecosystem services and non-use values including existence). Despite difficulties in including these values in its economic efficiency analysis, Tongass staff included an extensive review of studies by academic, government, and non-governmental organizations providing a range of willingness-to-pay and other estimates for existence and other values.⁵⁶ The planning team also qualitatively assessed tradeoffs relating to species impact based on species’ conservation statuses, with greater weights given to less secure species.⁵⁷

In other cases where non-market outputs or outcomes are difficult to monetize, agencies have successfully used break-even analyses to ensure that decisions are empirically sound. White House guidance on rulemakings encourages this type of “threshold” analysis.⁵⁸

A break-even analysis asks how effectively a proposed rule or plan would have to accomplish its goal in order for monetized benefits to exceed costs. Then it asks whether it is reasonable and plausible to assume that the proposed action will be as effective as needed to reach this break-even point.⁵⁹ For example, EPA used break-even analysis to address uncertainties around non-use values in issuing its Phase II Cooling Water Intake Regulation in 2004.⁶⁰ The rule established performance standards for the cooling water intake systems of electricity generation and transmission facilities that draw substantial water from U.S. rivers, lakes, and other bodies of water. EPA sought to minimize the adverse environmental impact of cooling water intake structures—especially the mortality of aquatic organisms—and had to consider a wide range of costs and benefits, including ecosystem services, recreation, and commercial fishing. The Agency used break-even analysis to identify the minimum levels of unmonetized non-use benefits that would justify the rule’s costs under various approaches. As EPA noted in its Final Rule, its results provided a useful framework for policy analysis: “Is the true per household willingness-to-pay for the non-use amenities (existence and bequest) associated with the final rule likely to be greater or less than the ‘breakeven’ benefit levels [calculated]? Unfortunately, the existing body of empirical research is inadequate to answer this question on behalf of the nation as a whole, but EPA is providing the analysis to aid policy makers and the public in forming their own judgment.”⁶¹

⁵⁵ U.S. FOREST SERV., RECORD OF DECISION FOR THE INYO NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN 8 (1988).

⁵⁶ U.S. FOREST SERV., TONGASS LAND AND RESOURCE MANAGEMENT PLAN: FINAL ENVIRONMENTAL IMPACT STATEMENT 3-544–3-552 (2008).

⁵⁷ Marcot, *supra* note 23, at 129.

⁵⁸ OMB Circular A-4, *supra* note 14, at 2.

⁵⁹ See, e.g., U.S. DEP’T OF JUSTICE, REGULATORY IMPACT ASSESSMENT, NATIONAL STANDARDS TO PREVENT, DETECT, & RESPOND TO PRISON RAPE UNDER THE PRISON RAPE ELIMINATION ACT (PREA), DOCKET NO. OAG-131, at 158 (May 17, 2012).

⁶⁰ National Pollutant Discharge Elimination System—Final Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 69 Fed. Reg. 41,576, 41,663 (July 9, 2004), *suspended by* National Pollutant Discharge Elimination System—Suspension of Regulations Establishing Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 72 Fed. Reg. 37,107 (July 9, 2007) (codified at 40 C.F.R. §§ 122, 125).

⁶¹ *Id.*

IV. Cost-Benefit Analysis Need Not Pose a Substantial Burden on Analytical Resources

One of the Forest Service's goals in drafting the 2012 Rule was to reduce the cost and time involved in updating unit LRMPS. Some perceive cost-benefit analysis as an inherently resource-intensive process. This need not be the case. Forest plan monitoring and revision requires collection of data on relevant variables and a method for analyzing that data.

Regardless of how it processes its information, the Forest will have to study the potential effects of plan alternatives on wildlife habitat, recreational opportunities, timber output, ecosystem services, and other values.⁶² Thus, undertaking cost-benefit analysis imposes little incremental data collection costs. Quantifying and monetizing effects on non-market resources such as recreational values can be challenging, but need not be prohibitively costly. The Forest can rely on existing models drawn from peer-reviewed literature or from planning and analysis offices within the Forest Service, the Department of Agriculture, or elsewhere in the Federal or State government to monetize non-market values under various planning scenarios.⁶³ As it updates its plan going forward, the Forest can continue to rely on the same or similar models and update their estimates with any new information it collects. Where monetizing these values is not feasible, the Forest can attempt to quantify the impacts of planning alternatives in non-monetary terms, and use these qualitatively along with results from a cost-benefit analysis.⁶⁴

V. Conclusion

As one of the handful of forests selected to be among the first to revise their forest plans under the new Rule, the Chugach has the opportunity to fully explore the greater flexibility that Rule provides, and to set an example for other forests. But, as it goes about doing so, it should continue to integrate systematic economic analysis into its planning process. Beyond helping to assure that the final forest plan is fully in line with the statutory requirements of the MUSYA and NFMA, doing so will allow it to most effectively make use of the structured decisionmaking framework envisioned by the new Rule.

Respectfully Submitted,

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⁶² 36 C.F.R. §219.6(b).

⁶³ See, e.g., GINNY FAY ET AL., USDA, GENERAL TECHNICAL REPORT PNW-GTR-808, DATA SURVEY AND SAMPLING PROCEDURES TO QUANTIFY RECREATION USE OF NATIONAL FORESTS IN ALASKA (2010).

⁶⁴ See, e.g., Benson C. Sherrouse et al., *A GIS Application for Assessing, Mapping, and Quantifying the Social Values of Ecosystem Services*, 31 APPLIED GEOGRAPHY 748 (2011).