Stanford Law School

Comments and Recommendations

for the

Steering Committee on Federal Infrastructure Permitting and Review Process Improvement

and

The President's Chief Performance Officer, Director of OIRA, and Chair of the Council on Environmental Quality

Policy Lab Class 395
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I. INTRODUCTION AND BACKGROUND

A. The President's Infrastructure Permitting Executive Order

On March 22, 2012, the President issued Executive Order 13604, entitled: "Improving the Performance of Federal Permitting and Review of Infrastructure Projects."[1] The President's goal in launching this initiative, as stated in the Executive Order, is "to significantly reduce the aggregate time required to make decisions in the permitting and review of infrastructure projects by the Federal Government, while improving environmental and community outcomes."

As a follow-up to his issuance of the Executive Order, the President issued a Memorandum for the Heads of Executive Departments and Agencies on May 17, 2013, in which he called on the Steering Committee on Federal Infrastructure Permits and Review Process Improvement, in coordination with the President's Chief Performance Officer, the Director of OIRA and the Chair of the Council for Environmental Quality (collectively hereinafter referred to as the Steering Committee), to prepare a plan involving a "comprehensive modernization of Federal review and permitting for infrastructure . . . [and] that outlines specific steps for re-engineering both the intra- and inter-agency review and approval processes based on experience implementing Executive Order 13604."[2]

The President directed the Steering Committee to address a number of specific topics in its forthcoming plan, as part of the Executive Order's "modernization efforts." One such topic involves the manner in which environmental mitigation obligations are identified and addressed for infrastructure projects. More specifically, Section 1(b)(9) of the President's Memorandum requires that the Committee "**identify improvements to mitigation policies to provide project developers with added predictability, facilitate landscape-scale mitigation based on conservation plans and regional environmental assessments, facilitate interagency mitigation plans where appropriate, ensure accountability and the long-term effectiveness of mitigation activities, and utilize innovative mechanisms where appropriate**."[3]

In asking the Steering Committee to develop an approach to modernize the federal government's approach to mitigating the environmental impacts of infrastructure projects, the President acknowledged that some agencies in the government already have been applying "best management practices," including "employing project-planning processes and individual project designs that consider local and regional ecological planning goals" and "utilizing landscape- and watershed-level mitigation practices." He

[1] Exec. Order No. 13,604, 77 Fed. Reg. 18887 (Mar. 28, 2012), *available at* http://www.gpo.gov/fdsys/pkg/DCPD-201200202/pdf/DCPD-201200202.pdf.
[2] Memorandum from Barack Obama on Modernizing Federal Infrastructure Review and Permitting Regulations, Policies, and Procedures to the Heads of Executive Departments and Agencies (May 17, 2013), *available at* http://www.whitehouse.gov/the-press-office/2013/05/17/presidential-memorandum-modernizing-federal-infrastructure-review-and-pe.
[3] *Id.* (emphasis added).

asked that such best practices be "institutionalized" and that further improvements be made by "enhanc[ing] efficiencies in the application of regulations and processes involving multiple agencies—including expanding the use of web-based techniques for sharing project-related information, facilitating targeted and relevant environmental reviews, and providing meaningful opportunities for public input through stakeholder engagement."[4]

B. The Mitigation Hierarchy

Under the broadly recognized "mitigation hierarchy," permitting agencies are encouraged, first, to seek to avoid or minimize infrastructure projects' adverse impacts by optimizing their siting and design.[5] Good planning, conducted on a landscape scale, can advance this goal by identifying potential locations for siting infrastructure projects that involve fewer environmental conflicts. The Bureau of Land Management's "Western Solar Plan," for example, identified "solar energy zones" on public lands in six southwestern states where solar applications would be encouraged because the zones are well situated for transmission connectivity and because they raise limited environmental concerns.[6] Likewise, the Interior Department's Bureau of Ocean Energy Management has undertaken a planning process with other federal agencies, and affected states, to identify offshore "Wind Energy Areas" that should be prioritized for offshore leasing because they raised fewer conflict issues.[7]

Where siting options are limited and where some negative environmental impacts are unavoidable, the mitigation hierarchy anticipates that project developers will be required to underwrite some form of "compensatory mitigation" either on site, or on an off-site location.[8] **The comments and recommendations in this submittal focus on situations in which environmental impacts cannot be avoided, thereby giving rise to compensatory mitigation obligations.**

C. Varying Agency Approaches to Compensatory Mitigation

As discussed in detail below, different agencies have taken different approaches in how they deal with compensatory mitigation obligations. The Army Corps of Engineers has the most mature mitigation program in the federal government. Its program focuses on wetlands impacts that fall under the Corps' Clean Water Act jurisdiction. Over time, the

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[4] *Id.*

[5] *See, e.g.*, 40 C.F.R § 230.91(c)(2) (requiring applicants for Section 404 permits under the Clean Water Act (CWA) to first "take all appropriate and practical steps to avoid and minimize impacts" and stating that compensatory mitigation will then be considered for unavoidable impacts); 40 C.F.R. § 1508.20 (summarizing the mitigation hierarchy used in the NEPA process).

[6] BUREAU OF LAND MGMT., APPROVED RESOURCE MANAGEMENT PLAN AMENDMENTS/RECORD OF DECISION (ROD) FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES (2012), *available at* http://solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf.

[7] Press Release, U.S. Dept. of the Interior, Salazar Launches "Smart from the Start" Initiative to Speed Offshore Wind Energy Development Off the Atlantic Coast (Nov. 23, 2010), *available at* http://www.doi.gov/news/pressreleases/Salazar-Launches-Smart-from-the-Start-Initiative-to-Speed-Offshore-Wind-Energy-Development-off-the-Atlantic-Coast.cfm.

[8] *See, e.g.*, 40 C.F.R § 230.91(c)(2); 40 C.F.R. § 1508.20.

Corps has learned that offsite mitigation, implemented in a non-contiguous part of an affected watershed, can be an effective location for compensatory mitigation.[9] This approach also can be preferable from an administrative standpoint to project-specific mitigation implemented by project sponsors. It also is noteworthy that the Corps' detailed guidelines for off-site compensatory mitigation of wetlands impacts have facilitated the formation of private water banks that can provide a high quality compensatory mitigation option, at a low transaction cost, for many project developers.[10]

Compensatory mitigation also is frequently required to address impacts on species that are protected under the Endangered Species Act. In contrast to the Corps, the Fish & Wildlife Service and National Marine Fisheries Service have less mature mitigation programs. The Services typically proceed on a case-by-case, project-by-project basis. The same is often true for other federal permitting entities -- such as the Department of Transportation, for highways, bridges, airports, ports, and other transportation projects; the Bureau of Reclamation, the Bureau of Land Management, the U.S. Forest Service, and the Department of Defense, for projects that implicate federal lands and/or resources; or the Federal Energy Regulatory Commission, the Department of State or other federal agencies that may have more narrow permitting authorities and obligations. These **agencies historically have not given high priority regarding how to efficiently and effectively implement compensatory mitigation obligations. As a result, one-off projects are the norm, developed on a case-by-case basis, and in a manner that can extend permitting timelines and potentially create confusion with other agencies' mitigation requirements**.[11]

II. EXECUTIVE SUMMARY

The Stanford Law School Policy Lab Class 395 has been focusing on the President's goal of modernizing how federal agencies address infrastructure projects' compensatory mitigation requirements in a manner that is more efficient than the current, agency-by-agency, and project-by-project approach, and that improves environmental outcomes. Following the guideposts set out by the President, the class has analyzed: (1) the scope of the relevant agencies' authority to require compensatory mitigation for infrastructure projects, including whether multiple agencies have the authority to implement compensatory mitigation on a unified basis, using broadly applicable environmental criteria; (2) how federal agencies might utilize advanced, landscape-scale planning to identify regionally significant mitigation projects; and (3) what mechanisms might be used to efficiently implement a modern mitigation approach for infrastructure projects. The class respectfully submits these comments and recommendations to the Steering Committee, the Chief Performance Officer, the Director of OIRA and the Chair of the Council on Environmental Quality in the hope that they will assist in the development of the forthcoming plan under Executive Order 13604.

[9] *See infra* Part III.C.
[10] *See infra* Part V.B.
[11] *See infra* Part III.D-G.

Pursuing A Multi-Agency Approach to Compensatory Mitigation

- As encouraged by the President under Executive Order 13604, the Administration potentially could seek to align the many federal agencies that have infrastructure permitting and approval authority toward a multi-agency approach for dealing with compensatory mitigation. If well conceived and well executed, off-site compensatory mitigation has the potential to be leveraged to greater environmental benefits, working in tandem with other programs that are addressing important, regional, landscape-scale environmental needs/benefits.

- A threshold question regarding this potential approach is whether the statutory and regulatory authorities that underlie the various agencies' permitting and approval schemes are broad enough to allow for a multi-agency approach that would enable relevant agencies to agree on a common approach for identifying permittee investments in high-quality, landscape-scale mitigation that would satisfy all agencies' compensatory mitigation requirements.

- *Because the agencies' mitigation authorities are framed expansively in underlying statutes, a multi-agency mitigation approach that is based on broadly applicable environmental criteria potentially could satisfy all agencies' compensatory mitigation needs.* Some tailoring of off-site mitigation deliverables may be required for projects that have particularly significant negative impacts on wetlands and/or endangered species, but for many projects, directing mitigation dollars toward high quality watershed and habitat/species health potentially could satisfy all compensatory mitigation requirements.

Multi-Agency Guidance; Potential Joint Rulemaking Option

- Adopting a multi-agency mitigation approach that potentially would satisfy all of the agencies' compensatory mitigation requirements would be a bold stroke that potentially could reduce permitting time and cost, while yielding improved environmental benefits. *Given the fact that such an approach would be a substantial departure from the status quo:*

    - *It may be prudent to develop multi-agency, joint guidance that lays out the policy and legal underpinnings of a comprehensive compensatory mitigation strategy.*
    - *Alternatively, a separate regulatory path adopting a multi-agency compensatory mitigation approach that adopts broadly applicable environmental criteria could be codified in jointly released regulations under several applicable statutes.*

How to Develop a Multi-Agency *Planning* Approach for Compensatory Mitigation

- A multi-agency, multi-disciplinary advanced planning effort that identifies important regional conservation needs and priorities, on a landscape-scale and

taking climate change impacts into account, would potentially be the starting-point for such a multi-agency compensatory mitigation program. Best results would likely be achieved when federal agencies partner with states, tribes, communities and stakeholders in a planning effort that focuses on keeping larger ecosystems intact, protecting strongholds for species, watershed health, and the like.

- In undertaking advanced mitigation planning on a landscape scale, it is important that permitting agencies work together, applying a Multi-criteria Decision Analysis (MDCA) approach, and identify specific criteria and metrics that will be used to identify important landscapes. MDCA criteria used to identify planning considerations should be guided by statutory considerations (e.g., environmental harms/benefits; cultural issues, in response to National Historic Preservation Act considerations, tribal consultations, etc.). Additional criteria may include environmental justice and other social equity considerations. Criteria should be informed by the engagement of key stakeholders. The criteria should be as simple and straight forward as possible.

- There are a number of significant efforts underway in several agencies to develop Multi-criteria Decision Analysis approaches for compensatory mitigation planning and execution that could provide the basis for a broad-based, multi-agency compensatory mitigation approach. Several are highlighted in these comments, including the Bureau of Land Management's Rapid Eco-regional Assessments, which identify a few high-level criteria that exemplify the type of criteria that may provide an effective landscape-scale evaluative tool.

How to Develop a Multi-Agency Landscape-Scale *Implementation* Approach for Compensatory Mitigation

- After criteria have been identified and applied through a planning process to identify important regional landscapes that can be enhanced by compensatory mitigation investments, the permitting process should identify the unavoidable impacts associated with specific projects and match them up with landscape-scale investments.
- The matching process should be conducted in an "equivalence" basis that does not seek an exact, project-specific fit between localized harms and regional benefits. An equivalence analysis should be based on relative degrees of environmental impacts and landscape scale benefits. To ensure equivalence, it may be appropriate to apply a "net benefits" (as opposed to a "no net loss") approach when comparing localized harms versus regional benefits.
- Private conservation banks and other reliable third parties should be encouraged to facilitate productive investments in landscape-scale environmental benefits, and assist in the permitting process. In lieu mitigation also should be considered.
- To increase efficiency and lower transaction costs, there should be a strong bias in favor of identifying and discharging off-site compensatory mitigation obligations on a one-time basis, without on-going liability for the project developer.

- Landscapes that receive compensatory mitigation investments must be monitored and expected improvements must be confirmed.

Voluntary Actions – Sage Grouse

- Landscape scale evaluations also have the potential to identify voluntary, early action opportunities for private parties to undertake conservation actions that could provide them with banked credits for use in addressing future infrastructure siting needs. The current attention being devoted to landscape level habitat needs for sage grouse provides a timely case example of such a potential voluntary program.

III. SCOPE OF AGENCIES' AUTHORITY TO REQUIRE COMPENSATORY MITIGATION

A requirement that project sponsors provide compensation for their projects' unavoidable environmental injuries is imbedded in the statutory framework surrounding the permitting process. The starting point for the requirement is the National Environmental Policy Act (NEPA), which requires that federal decision-makers evaluate the environmental impacts associated with projects under review. As explained further below, NEPA anticipates that some environmental impacts may be unavoidable, and it requires that decision-makers evaluate options for mitigating those impacts. Likewise, the legal authorities underlying agency-specific permitting and review procedures typically require an evaluation of compensatory mitigation to address unavoidable impacts.

A. National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires that Federal agencies undertake environmental reviews before undertaking any action that could have significant environmental impact.[12] Regulations promulgated by the Council on Environmental Quality (CEQ) under NEPA make it clear that agencies must consider not only the environmental impacts associated with proposed projects, but reasonable alternatives, **including mitigation measures that would reduce the negative environmental impacts associated with a specific project.**[13] More specifically, the *Regulation for Implementing the Procedural Provisions of the National Environmental Policy Act* states that an agency's environmental impact statement shall "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public", and "include appropriate mitigation measures not already included in the proposed action or alternatives"[14] CEQ regulations define mitigation to include

[12] 42 U.S.C. § 4332 (2011).

[13] 40 C.F.R. § 1508.20 (summarizing the "mitigation hierarchy" and outlining the type of mitigation measures that should be evaluated in environmental reviews and that can be required as permit or approval conditions).

[14] 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.14 ("This section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections on the Affected Environment and the Environmental Consequences, it should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and

"[c]ompensating for the impact by replacing or providing substitute resources or environments."[15]

In addition to requiring reviewing agencies to evaluate mitigation options, NEPA makes it clear that agencies are expected to condition grants, permits or other approvals on a commitment to implement specified mitigation measures:

> "Agencies may provide for monitoring to assure that their decisions are carried out and should do so in important cases. *Mitigation (§1505.2(c)) and other conditions established in the environmental impact statement or during its review and committed as part of the decision shall be implemented by the lead agency or other appropriate consenting agency.* The lead agency shall: (a) *Include appropriate conditions in grants, permits or other approvals*.
> (b) Condition funding of actions on mitigation.
> (c) Upon request, inform cooperating or commenting agencies on progress in carrying out mitigation measures which they have proposed and which were adopted by the agency making the decision.
> (d) Upon request, make available to the public the results of relevant monitoring."[16]

As further evidence of the central role that mitigation issues are expected to play in NEPA reviews, CEQ issued guidance in 2011[17] which concluded that "when [] mitigation measures are available and an agency commits to perform or ensure the performance of them, these mitigation commitments can be used to support a FONSI [Findings of No Significant Impact], allowing the agency to conclude the NEPA process and proceed with its action without preparing an EIS."[18]

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providing a clear basis for choice among options by the decision maker and the public. In this section *agencies shall: . . . (f) Include appropriate mitigation measures not already included in the proposed action or alternatives*." (emphasis added)); *id.* §1503.3(d) ("When a cooperating agency with jurisdiction by law objects to or expresses reservations about the proposal on grounds of environmental impacts, the agency expressing the objection or reservation *shall specify the mitigation measures it considers necessary to allow the agency to grant or approve applicable permit, license, or related requirements or concurrences.*" (emphasis added)); *id.* § 1508.25 ("'Scope' consists of the *range of actions, alternatives, and impacts to be considered in an environmental impact statement*. The scope of an individual statement may depend on its relationships to other statements. To determine the scope of environmental impact statements, *agencies shall consider* three types of actions, three types of alternatives, and three types of impacts. They include . . . [a]lternatives, which include . . . *mitigation measures*" (emphasis added)).

[15] 40 C.F.R. § 1508.20.

[16] 40 C.F.R. §1505.3 (emphasis added).

[17] Council on Environmental Quality, Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843 (Jan. 21, 2011) (codified at 40 C.F.R. §§ 1500-02, 1505-08).

[18] *Id.* at 3848.

The guidance thus allows for "Mitigated FONSIs" where the agency has committed to *enforceable* mitigation measures.[19] Moreover, the guidance directs agencies to ensure that mitigation commitments are actually implemented, and consider monitoring and adaptive management measures.[20] Agencies "should not commit" to mitigation in either an EIS or a mitigated FONSI "absent the authority or expectation of resources to ensure that the mitigation is performed."[21]

Thus, NEPA anticipates that reviewing agencies will be identifying potential mitigation approaches and, where appropriate, conditioning permits on the implementation of appropriate mitigation measures. This legal framework suggests that all of the agencies reviewing infrastructure projects and making related permitting decisions or undertaking statutorily-required reviews should be working together, both in evaluating potential environmental impacts, and in developing an approach to mitigation that will satisfy the mitigation needs for all of the agencies. As a result, adopting a coordinated, multi-agency approach to implementing mitigation requirements is consistent with both the letter, and the spirit, of NEPA – the statute that provides the overarching framework for evaluating environmental impacts and identifying appropriate mitigation obligations associated with infrastructure projects.

B. The Endangered Species Act

Overall ecosystem health is of central importance to the Endangered Species Act (ESA). The ESA's stated purpose is both "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved" and "to provide a program for the conservation of such endangered species and threatened species."[22] These aims are promoted throughout the Act, and Sections 7 and 10 serve as the means for applying them to a broader, landscape-scale mitigation planning effort.

1. Sections 7 and 10 provide the authority for relying on broad-based, landscape-scale mitigation as an appropriate conservation measure for listed species.

The ESA prohibits federal agencies from taking action that may jeopardize an endangered or threatened species.[23] Although the ESA further prohibits all persons from "taking" a listed species,[24] Sections 7 and 10 provide exceptions to this general take prohibition.[25]

Under Section 7, a federal agency proposing action that may impact a listed species must consult with the Services (US Fish and Wildlife Service [FWS] and National Marine

[19] *Id.* at 3848 n.21.
[20] *Id.* at 3849-40.
[21] *Id.* at 3847.
[22] The Endangered Species Act § 2, 16 U.S.C. § 1531(b) (2011).
[23] *Id.* § 1536(a)(2).
[24] *Id.* § 1538(a)(1).
[25] *Id.* §§ 1536(b)(4); 1539(a)(1).

Fisheries Service [NMFS]).[26] If the Services conclude that the agency action will result in take of the species but will not likely jeopardize the survival of the species or adversely modify critical habitat, the Services must issue an incidental take statement (ITS) permitting the federal agency to proceed subject to "reasonable and prudent" conditions that the Services "consider necessary or appropriate to minimize impact(s)" to the species.[27]

In the absence of explicit language in Section 7 authorizing mitigation,[28] the Services' views on mitigation have evolved over time and now appear to concur that compensatory actions can be (and, in fact, have been) among the type of "reasonable and prudent" measures that the Services require action agencies to undertake through the Section 7 consultation process.

Initially, the Services issued an ESA Section 7 Consultation Handbook in 1998 which stated that "it is not appropriate to require mitigation for the impacts of incidental take," and that conservation measures "can include only actions that occur within the action area . . . and reduce the level of take associated with project activities."[29] In 2003, however, the FWS issued a memorandum on conservation banking which notes that "activities regulated under Section 7 or Section 10 of the ESA may be eligible to use a conservation bank, if the adverse impacts to the species from the particular project are offset by buying credits created and sold by the bank."[30] More recently, the FWS used its authority to conserve threatened and endangered species under Section 7 to develop a Recovery Credit System (RCS). An RCS is a non-site specific tool designed to "enhance the ability of federal agencies to promote the recovery of listed species on non-federal land and offset adverse effects to listed species from proposed actions" with the goals of producing "a net conservation benefit for the target species[,]" "increas[ing] the flexibility of federal agencies to accomplish their missions while meeting their requirements under the ESA, and promot[ing] effective partnership between federal and non-federal entities."[31] Moreover, it is not unusual in practice for regional offices to

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[26] *Id.* § 1536(a)(2).
[27] *Id.* § 1536(b)(4)(C).
[28] *See Id.* § 1536(a)(2); JESSICA B. WILKINSON ET AL., ENVTL. LAW INST. AND THE NATURE CONSERVANCY, THE NEXT GENERATION OF MITIGATION: LINKING CURRENT AND FUTURE MITIGATION PROGRAMS WITH STATE WILDLIFE ACTION PLANS AND OTHER STATE AND REGIONAL PLANS (2009), *available at* http://www.elistore.org/reports_detail.asp?ID=11359.
[29] U.S. FISH AND WILDLIFE SERV. AND NAT'L MARINE FISHERIES SERV., CONSULTATION HANDBOOK: PROCEDURES FOR CONDUCTING CONSULTATION AND CONFERENCE ACTIVITIES UNDER SECTION 7 OF THE ENDANGERED SPECIES ACT 4-53 (1998), *available at* http://www.nmfs.noaa.gov/pr/pdfs/laws/esa_section7_handbook.pdf.
[30] U.S. Fish and Wildlife Serv., Memorandum on Guidance for the Establishment, Use, and Operation of Conservation Banks 8 (May 8, 2003), *available at* http://www.fws.gov/endangered/esa-library/pdf/Conservation_Banking_Guidance.pdf.
[31] U.S. FISH AND WILDLIFE SERV., ENDANGERED SPECIES RECOVERY CREDITS: QUESTIONS AND ANSWERS (2007), *available at* http://www.fws.gov/home/feature/2007/endangeredspeciesrecoveryqsandasvf1107.pdf; *see also* Notice of Availability for Draft Recovery Crediting Guidance, 72 Fed. Reg. 62258 (Nov. 2, 2007).

recognize that improving the status of particular species often demands habitat management and to then create conservation measures that incorporate compensation as one of the "reasonable and prudent" conditions which are "necessary and appropriate to minimize impact" of incidental take to a species.[32]

Under Section 10, a project lacking a federal nexus may acquire an incidental take permit (ITP) after the preparation of a Habitat Conservation Plan (HCP).[33] Among other things, an HCP must explain what the applicant will do to "minimize and mitigate" the impacts of the taking.[34] An ITP is granted if the taking "will not appreciably reduce the likelihood of the survival and recovery of the species in the wild."[35] Mitigation strategies vary widely among different HCPs, but compensatory mitigation in the form of land preservation, management, or enhancement is a common component of an HCP. The Services' HCP Handbook describes "acquiring or otherwise protecting replacement habitat at an onsite or offsite location" as an acceptable mitigation model.[36]

2. The Endangered Species Act is flexible in application and incorporates concepts associated with landscape-level conservation and mitigation planning.

Additional regulatory and implementation history under the ESA indicate that the statute can accommodate a great deal of flexibility in achieving its purpose of conserving the ecosystems upon which imperiled species rely. "Safe harbor" agreements, the "no surprises" rule, and Candidate Conservation Agreements with Assurances all encourage the development of creative, non-prescriptive conservation strategies, while helping protect landowners against future unforeseen circumstances. Indeed, HCPs are predicated on the concept that off-site, compensatory mitigation strategies that focus on the overall health of the ecosystem can provide more significant species benefits than addressing single, small-scale developments on a piece-meal basis. Increasingly, HCPs are framed to cover multiple species, and they are designed to take advantage of the greater benefits for species health associated with larger, contiguous landscapes.

Conservation planning often involves the identification of umbrella, keystone, or other surrogate species as a decision-making tool because protecting these species may indirectly protect other species associated with them. Recognizing the value of habitat function and quality, regional compensatory mitigation for such indicator species may potentially benefit numerous other species in addition to aiding in identifying changes in many aspects of an ecosystem.

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[32] *See* 16 U.S.C. § 1536(a)(2); U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-01-287R, ENDANGERED SPECIES ACT: FEE-BASED MITIGATION ARRANGEMENTS (Feb. 15, 2001), *available at* http://www.gao.gov/new.items/d01287r.pdf.
[33] 16 U.S.C. § 1539(a)(2).
[34] *Id.*
[35] *Id.*
[36] U.S. FISH AND WILDLIFE SERV. AND NAT'L MARINE FISHERIES SERV., HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING HANDBOOK 3-21 (1996), *available at* http://www.nmfs.noaa.gov/pr/pdfs/laws/hcp_handbook.pdf.

The Services' increasing emphasis on using "surrogates" to estimate species numbers provides additional evidence that the ESA's purposes are advanced by promoting landscape-level mitigation that enhances species habitat. In particular, the Services have used a flexible approach for estimating "take" under the ESA when direct measurement of individuals of a listed species is not possible or is impractical. Although the Services have often used ecological "surrogates" to monitor take in terms of anticipated losses to related species or changes in species habitat, in September 2013, the Services issued a proposed rule to codify their use of surrogates to assess take in an ITS.[37] The new rule would require the Services to demonstrate why a numeric expression of take of individuals of the listed species would be impractical and show that a causal link exists between the surrogate and the take of the listed species.[38] The same rule proposes to use "Programmatic Incidental Take Statements" for ongoing or long-term federal actions.[39]

Given the ability of the Services to implement varied policies within the existing framework of the ESA and the recent proposed regulatory changes, it appears that the ESA's authorities are potentially broad enough to endorse a compensatory mitigation approach that focuses on regional, landscape-scale habitat improvement for species. Species-specific take issues presumably will need to be addressed with specificity for some projects, but the use of surrogates and a focus on high quality habitat suggest that ESA's call for "reasonable and prudent" measures may be satisfied for many projects through investments in habitat enhancements associated with regional, landscape-scale mitigation undertakings.

3. The flexibility of the ESA can be leveraged to expand the role of states in implementing compensatory mitigation to encourage more effective landscape-level conservation efforts.

An additional issue in the development of a landscape-scale approach to mitigation is whether state-developed advanced mitigation planning efforts might provide the basis for ESA compensatory mitigation approvals.

Heavy state involvement may make sense, particularly with regard to generalized landscape-scale advanced mitigation planning because state authorities may be particularly well-positioned to identify and implement conservation opportunities within their borders. States typically have excellent familiarity with regional ecosystems and the best understanding of the baseline conditions of the region; credible and suitable resources, tools, and strategies for engaging other stakeholders and working effectively within their region; and a strong sense of accountability and ownership. States may be particularly well suited to develop and implement the monitoring and stewardship phase of mitigation plans because they can help define appropriate management objectives and

[37] U.S. Fish and Wildlife Serv. & Nat'l Marine Fisheries Serv., Interagency Cooperation-Endangered Species Act of 1973, as Amended; Incidental Take Statements**,** 78 Fed. Reg. 54437 (Sept. 4, 2013).
[38] *Id.*
[39] *Id.*

outcomes while remaining flexible enough to respond to changes in management goals as needed.

The Endangered Species Act clearly identifies one of its functions as taking "such steps as may be appropriate to achieve" the purpose of "encouraging the States and other interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs which meet national and international standards."[40] This suggests that the statute is broad enough to provide a basis for a strong role for states in administering compensatory mitigation. In particular, Section 6 encourages the Services to cooperate "to the maximum extent practicable with the States" when entering into agreements to protect threatened and endangered species.[41] While state involvement in the development of HCPs is already well established, there do not appear to be significant legal barriers under the ESA itself to placing greater responsibility on the States for implementing the minimization provisions of Section 7 or broader mitigation schemes.[42] In an effort to more fully engage states in endangered species conservation, the FWS and NMFS established the Joint Federal/State Task Force for ESA Policy in 2011.[43] While still in its infancy, this task force might serve as an important example for expanding state participation in ESA implementation.

Section 6 establishes the Cooperative Endangered Species Conservation Fund (CESCF) to provide funding to states and territories for conservation efforts on non-federal land but the statute is not highly prescriptive in terms of what programs may qualify to receive funding and sets out few restrictions.[44] One type of CESCF grant funds activities ranging from habitat restoration to development of management plans while another funds states and territories to acquire land associated with approved HCPs (though it will not directly fund the mitigation required of an HCP permittee).[45] Thus, many opportunities exist to shift funding and responsibility for oversight of regional mitigation to the states by incentivizing participation in CESCF grants.[46] Existing state-level programs like State

[40] 16 U.S.C. § 1531(a)(5).
[41] *Id.* § 1535(a).
[42] For a detailed discussion of the opportunities available under Section 6 and the role that greater state involvement under the ESA may be able to play in species conservation, see KAUSH ARHA & BARTON H. THOMPSON, JR., WOODS INSTITUTE FOR ENVIRONMENT, ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE SPECIES CONSERVATION THROUGH GREATER STATE COMMITMENT (2005), *available at* http://woods.stanford.edu/sites/default/files/files/Endangered-Species-Act-Policy-Paper-20050224.pdf and ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE SPECIES CONSERVATION THROUGH GREATER STATE COMMITMENT (Kaush Arha & Barton H. Thompson, Jr. eds., 2012).
[43] U.S. FISH AND WILDLIFE SERV., IMPROVING ESA IMPLEMENTATION THROUGH REGULATION REVIEW (2011), *available at* http://www.fws.gov/endangered/improving_esa/improving_esa.pdf.
[44] 16 U.S.C. § 1535(c).
[45] U.S. FISH AND WILDLIFE SERV., COOPERATIVE ENDANGERED SPECIES CONSERVATION FUND GRANTS (2013), *available at* http://www.fws.gov/endangered/esa-library/pdf/Section6_grants.pdf.
[46] For examples of projects which received funding through the CESCF in 2012, see U.S. FISH AND WILDLIFE SERV., FY 2012 COOPERATIVE ENDANGERED SPECIES CONSERVATION FUND

Wildlife Action Plans may also provide opportunities to fund mitigation planning and encourage information and resource sharing to support broad conservation efforts needed to benefit both listed species and other at-risk species.[47]

C. Clean Water Act

Section 404 of the Clean Water Act (CWA) requires permits for all dredge and fill activities in the nation's navigable waters, including wetlands.[48] The U.S. Army Corps of Engineers (Corps) has the day-to-day authority for issuing permits for these activities, but Congress assigned responsibility for developing the environmental criteria for permitting (the Section 404(b)(1) Guidelines) to the Environmental Protection Agency (EPA).[49]

1. Broad-based, landscape-scale mitigation is consistent with the Corps' authority and the regulations currently in place.

The mitigation program operated by the Corps is the most robust and fully developed mitigation regime in existence today. The Corps may require compensatory mitigation when the permit applicant has taken all "appropriate and practicable steps to avoid and minimize adverse impacts to waters of the United States."[50] The Corps first adopted a comprehensive mitigation program applicable to permit actions in 1986 and issued guidelines in conjunction with the EPA to set forth the process for carrying out mitigation under the program. In 2008, the Corps issued an updated set of regulations governing compensatory mitigation for activities authorized by Section 404 permits (Mitigation Rule).[51] These regulations supplement, and in some cases replace, past regulations and guidance.

Broad-based, landscape-scale mitigation is consistent with the current regulations in place surrounding Section 404 permits. The Mitigation Rule is the result of directives

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PROJECT DESCRIPTIONS ARRANGED BY STATE (2012), *available at* http://www.fws.gov/endangered/esa-library/pdf/FY12Section6AwardSummariesFinal.pdf.

[47] ENVTL LAW INST., MITIGATION OF IMPACTS TO FISH AND WILDLIFE HABITAT: ESTIMATING COSTS AND IDENTIFYING OPPORTUNITIES 62 (2007), *available at* http://www.elistore.org/reports_detail.asp?ID=11248.

[48] 33 U.S.C. § 1344(a) (2011).

[49] *Id.* § 1344(b).

[50] 40 C.F.R § 230.91(c)(2). Prior to determining that compensatory mitigation is appropriate, the Corps must ensure that all steps were taken to avoid and minimize the environmental impacts of the project. *Id.* The process could benefit from improved guidance on avoidance and minimization as well as additional capacity to check that permit applications considered alternative sites and took all appropriate minimization measures. James Murphy, Jan Goldman-Carter & Julie Sibbing, *Avoidance Avoided: How the New Rule Fails to Adequately Promote Avoidance and Places Difficult-to-Replace Systems at Risk*, NAT'L WETLANDS NEWSL., Mar.-Apr. 2009, at 14-15.

[51] U.S. Environmental Protection Agency & U.S. Army Corps of Engineers, Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19594 (Apr. 10, 2008) (to be codified at 33 C.F.R. pts. 325 and 332 and 40 C.F.R. pt. 230) [hereinafter Mitigation Rule].

from Congress issued in the 2004 National Defense Authorization Act.[52] The changes reflect a move toward landscape-scale mitigation. In particular, the new rule places emphasis on a watershed approach to compensatory mitigation, a reduction in the number of individual mitigation projects, greater financial and ecological assurances, and a minimization of temporal losses of wetland functions.[53] The Mitigation Rule also establishes a hierarchy of mitigation types: (1) use of credits from a mitigation bank, (2) use of credits from an in-lieu fee program, and (3) permittee-responsible mitigation.[54] The preference for mitigation banks represents a fundamental shift in the program toward off-site mitigation completed by third party banking entities.[55]

2. The watershed approach used by the Corps to determine mitigation requirements is consistent with landscape-level mitigation goals but could be improved through advanced planning.

The Corps uses a watershed approach to determine the required compensatory mitigation when issuing Section 404 permits. A watershed approach "considers the importance of landscape position and resource type of compensatory mitigation projects for the sustainability of aquatic resource functions within the watershed."[56] The ultimate goal is to "maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites."[57] In addition to aquatic resource function, the approach also considers "habitat requirements of important species, habitat loss or conversion trends, sources of watershed impairment, and current development trends, as well as the requirements of other regulatory and non-regulatory programs that affect the watershed, such as storm water management or habitat conservation programs."[58] These considerations link the Section 404 compensatory mitigation program to a broader habitat conservation vision.

The Corps' endorsement of a Section 404 watershed approach positions the program well to participate in a broader, landscape-scale compensatory mitigation scheme. Indeed, the advanced planning effort that lies at the heart of the landscape-scale approach could enhance the Corps' ability to implement its watershed approach by helping to proliferate the number of landscape-scale plans that are available for use. Currently, in the absence of a plan, the watershed approach must be based on "information provided by the project

[52] Congress required the Corps to issue "regulations establishing performance standards and criteria for the use . . . of on-site, off-site, and in-lieu fee mitigation and mitigation banking as compensation for lost wetlands functions. . . ." Pub. L. 108-136 (2006). Congress further directed the Corps to "maximize available credits and opportunities for mitigation, provide flexibility for regional variations in wetland conditions, functions and values, and apply equivalent standards and criteria to each type of compensatory mitigation" to the extent possible. *Id.*
[53] 40 C.F.R § 230.
[54] *Id.* § 230.93(b).
[55] The preference for mitigation banks is "based on administrative criteria, not ecological criteria," because mitigation banks "generally involve less risk and uncertainty than in-lieu fee programs and permittee-responsible mitigation." Mitigation Rule, *supra* note 4, at 19605.
[56] 40 C.F.R. § 230.93(c)(2)(i).
[57] *Id.*
[58] *Id.*

sponsor or available from other sources."[59] Advanced planning could save time in the permitting process by providing readily available information and reducing the time necessary to determine mitigation requirements.

Integrating the Corps' Section 404 program into a broader, landscape-scale compensatory mitigation scheme also could address the fact that "[t]he Corps [currently] has limited ability to force compensation providers—either permittees or bankers—to locate compensation projects in areas that are deemed ecologically desirable in a watershed plan or comprehensive conservation plan."[60] Advanced planning would ensure that the mitigation scheme includes the most ecologically desirable areas because mitigation banks would secure these lands prior to project development.

3. A landscape-scale approach is consistent with the Corps' "no net loss" policy.

If Section 404 compliance is integrated into a broader planning regime that focuses on general environmental benefits within larger landscapes and watersheds, the question may arise whether the potential absence of an acre-for-acre wetlands replacement approach would violate the Corps' traditional "no net loss" policy. The original goal of ensuring "no net loss" was established to ensure that the total wetlands acreage in the United States does not decrease, but rather remains constant or increases. This framework was first recommended as a goal for wetlands policy in 1987 at the National Wetlands Policy Forum, and President George H.W. Bush adopted it in 1989. Every president since has endorsed the policy.

"No net loss" has undergone definitional changes over time and the policy appears to be flexible enough to fit with a broad-based, landscape-scale mitigation approach. For example, the Mitigation Rule embraces the policy but suggests that loss may be quantified in terms of function rather than simply acreage. The Corps noted in the final rulemaking that "[w]ith this rule, we are moving towards greater reliance on functional and condition assessments to quantify credits and debits, instead of surrogates such as acres and linear feet . . . . For example, in a case where a project proponent is proposing to fill a degraded three acre wetland that provides one unit of wetland function per acre (as determined by a rigorous functional assessment method), the loss of that wetland may in some cases be offset by a compensatory mitigation project that provides fewer acres of high-functioning wetlands . . . ."[61] If a functional assessment is not used, "a minimum one-to-one acreage or linear foot compensation ratio must be used."[62] Because function is more difficult to assess than mere acreage, a scientifically sound functional assessment method is very important to achieving the goals of the no net loss policy.

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[59] *Id.*
[60] Jessica B. Wilkinson & Robert Bendick, *The Next Generation of Mitigation: Advancing Conservation Through Landscape-Level Mitigation Planning*. 40 ENVTL. L. REP. NEWS & ANALYSIS 10023 (2010).
[61] Mitigation Rule, *supra* note 4, at 19601-02.
[62] 40 C.F.R. § 230.93(f)(1).

While participation in a broad-based mitigation effort may satisfy Section 404, the current emphasis in the Mitigation Rule on restoration may need to be broadened in order to allow for maximum flexibility in achieving mitigation goals. Restoration, as opposed to enhancement and preservation, is the preferred method of compensatory mitigation under the Mitigation Rule.[63] This is because the "likelihood of success is greater and the impacts to potentially ecologically important uplands are reduced compared to [creation]" and the potential gains in function are greater compared to the other methods.[64] Simply relying on preservation as a compensation measure will result in a net loss because no function is added to the watershed; however, it is possible that preservation can be achieved at lower cost, and with higher environmental outcomes, than restoration, as discussed further below in Part VI.C.4. The current guidance regarding preservation should be reconsidered because, in our view, conservation investments can potentially yield more cost-effective results than active restoration activities.

An additional complication could arise where states are implementing Section 404 permitting under delegated authority and where such states have set forth prescriptive tests for compliance. Although the Corps has not set a minimum requirement for the number of acres required to replace wetlands that have been damaged or destroyed by a permitted activity, states can require certain mitigation ratios through the Section 401 Water Quality Certification process or through the Section 404 permitting process if the state has assumed management.[65] States with mitigation requirements usually require a ratio of more than one acre of mitigation for each acre of wetland harmed, and specific ratios may be tied to the type of mitigation used (creation, restoration, enhancement, or preservation). For example, Maine requires a ratio of from 1:1 to 2:1 for restoration, enhancement, or creation depending on the quality of the wetlands impacted, and a ratio of 8:1 where preservation is used.[66] Consistent mitigation ratios are probably not achievable because of the authority granted to individual states by the CWA; however, mitigation sites can be developed with the individual requirements in mind.

For all of these reasons, additional guidance and, potentially, new regulations should be considered if the Administration moves forward with a multi-agency compensatory mitigation approach. To repeat a key point made above:

> *Adopting a multi-agency mitigation approach that potentially would satisfy all of the agencies' compensatory mitigation requirements would be a bold stroke that potentially could reduce permitting time and cost, while yielding improved environmental benefits. Given the fact that such an approach would be a departure from the status quo, it may be prudent to develop multi-agency, joint guidance that lays out the policy and legal underpinnings of a comprehensive compensatory mitigation strategy. Alternatively, a separate regulatory path adopting a multi-agency compensatory mitigation approach that adopts broadly applicable environmental criteria could be codified in jointly released regulations under several applicable statutes.*

[63] 33 C.F.R. § 332.3(a)(2).
[64] *Id.*
[65] 33 U.S.C. § 1344(g).
[66] 06-096-310 ME. CODE R. § 5(C)(5) (LexisNexis 2013).

Note, in particular, the point that the current regulations could stay in place and continue to provide a pathway for compliance, while a new policy statement and/or regulations could provide a "separate regulatory path" that may be particularly appropriate for large infrastructure projects that may implicate the permitting and review authorities of a number of agencies.

4. A multi-agency landscape-scale mitigation approach should generally satisfy the Section 404 permitting process but tailoring may be required for projects with particularly serious impacts on wetlands.

In summary, the current compensatory mitigation program for wetlands acknowledges the possibility of landscape-scale mitigation that addresses environmental concerns beyond wetlands protections. Mitigation projects, including banks and in-lieu fee projects, "may be designed to holistically address requirements under multiple programs and authorities for the same activity."[67] This includes mitigation under the Endangered Species Act or for Habitat Conservation Plans.[68] A broader-based compensatory mitigation approach of the type discussed in these comments must simply include appropriate compensation for unavoidable impacts to aquatic resources without stacking credits for more than one permitted activity.[69]

In order for a multi-agency, landscape-scale mitigation approach to satisfy the Section 404 program, it will be important that the Corps be directly involved in identifying the general criteria for watershed health that are used to define landscapes and watersheds that are candidates for mitigation investments. The Corps also should be involved, with other key agencies, in the planning processes that apply agreed-upon criteria to specific landscapes. Where states are implementing the program, their involvement also will be critical to develop confidence that watershed health benefits associated with broad-based, landscape-scale mitigation investments will satisfy Section 404 requirements. There may be some infrastructure projects, however, for which additional compensatory mitigation may be required due to particularly direct and serious impacts that such projects have on wetlands resources.

D. Federal Land Policy and Management Act (Bureau of Land Management)

The Federal Land Policy and Management Act of 1976 (FLPMA) provides the underlying authority that the Bureau of Land Management relies upon in crafting resource management plans and issuing individual permits and leases for infrastructure projects under those plans. FLPMA provides BLM with broad discretion to manage

[67] 40 C.F.R. § 230.93(j)(1)(ii).
[68] *Id.* § 230.93(j)(3).
[69] *Id.* § 230.93(j)(1)(i)-(ii). In addition, credits for compensatory mitigation projects on public land must be based solely on aquatic resource functions provided by the compensatory mitigation project, over and above those provided by public programs already planned or in place. *Id.* 230.93(j)(2).

public lands under the principles of multiple use and sustained yield.[70] The Act states that Congress's policy is that "goals and objectives be established by law as guidelines for public land use planning, and that management be on the basis of multiple use and sustained yield,"[71] and that "the public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values."[72]

1. Broad-Based, Landscape-Scale Mitigation is Consistent with the Land Use Planning Criteria the BLM Must Consider Under FLPMA.

In developing resource management plans, FLPMA gives BLM broad discretion to consider a range of factors that focus on the long-term health of landscapes, including landscapes managed by multiple entities. In particular, the BLM must, among other things, consider the following land use planning guideposts: the "relative scarcity of the values involved and the availability of alternative means . . . and sites for realization of those values;" and the "present and potential uses of the public lands;" it must "weigh long-term benefits to the public against short-term benefits;" "coordinate the land use inventory, planning, and management activities of or for [public] lands with the land use planning and management programs of other Federal departments and agencies and of the States and local governments within which the lands are located," to the extent consistent with other public lands laws; and "use a systematic interdisciplinary approach to achieve integrated consideration of physical, biological, economic, and other sciences."[73]

2. The BLM has Authority Under FLPMA to Implement A Broad-Based, Landscape-Scale Approach to Mitigation Through Its Permitting Process.

BLM implements FLPMA's land use plans through its permitting processes. In managing the public lands under FLPMA, BLM "regulate[s], through easements, permits, leases, licenses, published rules, or other instruments as the Secretary deems appropriate, the use, occupancy, and development of the public lands."[74] The BLM also has specific authority to issue rights-of-way for roads, pipelines, and electricity generation and transmission on public lands.[75] Right-of-way permits must include terms and conditions that minimize damage to habitat and protect the environment.[76] If feasible, rights-of-way can be conditioned on locating to minimize damage to the environment.[77] Finally, the BLM has the authority to enter into cooperative agreements with other state and federal

[70] 43 U.S.C. § 1732(a). In addition to its authority to promulgate land use plans, the BLM also has general rulemaking authority under FLPMA. *Id.* § 1740.
[71] *Id.* § 1701(7).
[72] *Id.* § 1701(8).
[73] *Id.* § 1712(c).
[74] *Id.* § 1732(b).
[75] 43 U.S.C. § 1761(a).
[76] *Id.* § 1765(a)(ii).
[77] *Id.* § 1765(b). The permits can also include conditions that that the BLM deems necessary to protect the public interest "in the lands traversed by the right-of-way or adjacent thereto." *Id.*

agencies, nonprofits, and private landowners "for the protection, restoration, and enhancement of fish and wildlife habitat and other resources on public or private land . . . ."[78]

The goals, land use planning policies, and permitting authorities under FLPMA planning are broad enough to authorize BLM to promulgate policies and/or rules that would integrate landscape-scale mitigation planning and off-site compensatory mitigation requirements as a central part of its planning and permitting programs. Likewise, the BLM has the authority to require permit conditions that track FLPMA's broad policy goals, including the statute's expectation that the BLM uses an interdisciplinary, integrated approach in creating land use plans that considers alternative sites, long-term benefits, and opportunities for inter-agency coordination. Thus, FLPMA appears to anticipate the types of interagency coordination of planning and implementation efforts necessary for a comprehensive, multi-agency regional mitigation program.

3. The BLM Has Recognized Landscape-Scale Mitigation as Within Its FLPMA Authority, and is Already Undertaking Regional Mitigation Pilot Projects.

The BLM has acknowledged its authority to require off-site mitigation of the impacts of infrastructure projects. Its June 2013 Draft Regional Mitigation Manual states that "BLM may expressly condition its approval of [a] land-use authorization on an applicant's commitment to perform or cover the costs of mitigation, both onsite and outside the area of impact."[79] The mechanism for enforcing that authority is BLM identification of NEPA alternatives or denial of specific authorization by the BLM land manager.[80] Elsewhere, the BLM has specifically stated that off-site mitigation "may be appropriate for mitigating impacts from large development projects or closely associated smaller projects that could have undesirable cumulative effects, particularly where onsite mitigation is expected to be insufficient and it is unlikely important resource management objectives can be achieved," including both traditional and renewable energy projects.[81] The BLM has also contemplated allowing off-site mitigation to be regional, and even possibly inter-state, in scope.[82]

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[78] 16 U.S.C. § 1011 (the Wyden Amendment); *see also* Offsite Mitigation Q&A, http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2008.Par.12205.File.dat/IM2008-204_att1.pdf, at 1-5.

[79] Draft Regional Mitigation Manual at 1-5 - 1-6.

[80] *Id.* at 1-14. *See also* Instruction Memorandum No. 2008-204, http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/20080/IM_2008-204.html, and accompanying "Offsite Mitigation Questions and Answers," http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2008.Par.12205.File.dat/IM2008-204_att1.pdf. While that document disclaims the authority "to require an applicant to undertake mitigation offsite," it states that BLM may "expressly condition" its approval of a permit on an enforceable commitment to undertake off-site mitigation. Offsite Mitigation Q&A at 1-1.

[81] Offsite Mitigation Q&A at 1-3.

[82] *Id.*

BLM's Draft Regional Mitigation Manual also discusses the possibility of mitigation on non-BLM and non-federal lands, consistent with a regional mitigation program that would target the best prospects for mitigation in a given landscape.[83] That policy could be enhanced by adding a requirement for consideration of or participation in a broad-based, interagency landscape-scale mitigation program. We also recommend that the BLM clarify in its final guidance that off-site mitigation measures may be used to compensate for certain types of on-site effects inherent in infrastructure projects, such as fragmentation.[84] In addition, the Draft Manual's typology of whether "the replacement or substitution of resources or values [] are of the same type and kind as those impacted" should be clarified to allow for preferential treatment in the mitigation hierarchy of measures that positively affect a regional ecosystem over measures that are "in-kind" but have no substantial benefits to an ecosystem or species.[85]

The BLM already has taken steps along the path toward integrating landscape-scale mitigation approaches into its resource management planning process under FLPMA. After developing its Western Solar Plan, which identified solar energy zones and the criteria for forming additional solar energy zones, the BLM has initiated regional mitigation planning activities that match up with specific zones.[86] As discussed further below, the BLM's Dry Lake Solar Energy Zone, the first pilot project under this plan, has generated a draft "Guidance and Framework" document that develops the authority, hierarchy, and possible funding mechanisms for regional mitigation.[87] The regional mitigation plan for the Dry Lake SEZ itself included a stakeholder involvement process,[88] use of the BLM's Rapid Ecoregional Assessment in developing baseline data,[89] and a valuation metric.[90] The guidance clearly suggests that a landscape-scale compensatory mitigation approach is workable within the BLM's existing statutory authority.[91]

E. U.S. Forest Service

The U.S. Forest Service has similar land use planning authority to reference regional landscape-scale planning as compensatory mitigation required for a permit. The Forest Service has the same FLPMA authority as the BLM to issue rights-of-way for

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[83] Draft Regional Mitigation Manual at 1-6 – 1-7.
[84] *See id.* at 1-7 – 1-8.
[85] *See id.* at 1-9.
[86] Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States, http://solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf (Oct. 2012), at 165.
[87] Draft BLM Technical Note: Procedural Guidance and Framework for Developing Solar Regional Mitigation Strategies, http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/dry_lake_sez/april_2013.Par.98856.File.dat/Technical.Note.Draft.April2013.pdf (Apr. 29, 2012).
[88] *Id.* at 11.
[89] *Id.* at 12.
[90] *Id.* at 18.
[91] *See id.* at 6-7 (discussing authority under FLPMA, NEPA, the ESA, and the National Historic Preservation Act).

infrastructure projects.[92] Under existing regulations, Forest Service may condition special use permits for such rights-of-way to protect the environment.[93]

The Forest Service also has limited authority under the National Forest Management Act of 1976's requirement to develop resource and land management plans that provide for multiple use and sustained yield.[94] The Forest Service can update its regulations for the development and revision of plans, and has the authority to specify guidelines which "insure consideration of the economic and environmental aspects of various systems of renewable resource management," and "provide for diversity of plan and animal communities based on the suitability and capability of the specific land area" in order to meet multiple-use objectives.[95] As with BLM permits, USFS permits must be consistent with land management plans.[96]

F. Department of Defense

The Department of Defense also has authority under defense appropriations law and existing regulations that allow it to implement compensatory mitigation through a broad-based, landscape-scale planning exercise. DOD has the general authority "to provide for the conservation and rehabilitation of natural resources on military installations."[97] DOD, in cooperation with FWS, prepares "integrated natural resources management plans."[98] Among other criteria, those plans are expected to provide for habitat "enhancements or modifications" as appropriate and practicable.[99]

DOD Instruction 4715.03,[100] the primary policy guidance for DOD natural resources management, contains language that appears to be broad enough to encompass the use of off-site mitigation through a broad-based, landscape-scale framework. The guidance provides that DOD "shall manage its natural resources . . . in a long-term, comprehensive, coordinated, and cost-effective manner," and "demonstrate stewardship

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[92] 43 U.S.C. § 1761(a).
[93] *See* Final Directives for Forest Service Wind Energy Special Use Authorizations, Forest Service Manual 2720, Forest Service Handbooks 2609.13 and 2709.11, 76 Fed. Reg. 47353 (Aug. 4, 2011) ("Section 501(a)(4) of FLPMA, (43 U.S.C. 1761(a)(4)) authorizes the Forest Service to grant rights-of-way for the use and occupancy of NFS lands for generation, transmission, and distribution of electric energy. Forest Service regulations at 36 CFR part 251, Subpart B, provide for issuance of permits for rights-of-way granted under FLPMA. Both FLPMA (43 U.S.C. 1765(a)(ii)) and Forest Service regulations (36 CFR 251.56(a)(1)(i)(B)) allow the Agency to include terms and conditions that minimize damage to fish and wildlife habitat and otherwise protect the environment.") (response to comments).
[94] 16 U.S.C. § 1604(e). Federal definitions of "multiple use" and "sustained yield" are found in the Multiple-Use Sustained-Yield Act of 1960. *Id.* § 531. Regional mitigation is consistent with the principles of multiple use.
[95] *Id.* § 1604(g).
[96] *Id.* § 1604(i).
[97] 16 U.S.C. § 670a(a)(1)(A).
[98] *Id.* § 670a(a).
[99] *Id.* § 670a(b)
[100] Natural Resources Conservation Program, DOD Instruction 4715.03, *available at* http://www.dtic.mil/whs/directives/corres/pdf/471503p.pdf.

of natural resources in its trust by protecting and enhancing [] resources for mission support, biodiversity conservation, and maintenance of ecosystem services."[101] Instruction 4715.03 also includes guidance on off-site mitigation for compliance with endangered species and wetland protection.[102]

As further evidence of DOD's authority to engage in regional mitigation programs, DOD's plan for implementing E.O. 13604 with respect to renewable energy projects[103] includes an extensive discussion of the opportunities for interagency coordination through the mechanism of the DOD Siting Clearinghouse.[104] On-going interagency coordination projects that are proceeding on a landscape scale include the Western Regional Partnership and DOD's participation in the Desert Renewable Energy Conservation Plan (DRECP), which is proceeding pursuant to a December 2011 Memorandum of Understanding between DOD, California, and other federal agencies.[105]

G. Department of Transportation

Transportation projects that are authorized under federal law, and implemented with federally authorized funds, have environmental impacts that typically trigger mitigation obligations. Indeed, in recognition of this fact and the need to develop a more thoughtful approach to addressing mitigation responsibility, the Department of Transportation (DOT) led an important, multi-agency effort in 2006 to integrate mitigation planning and implementation in a broad-based, landscape-scale framework. A team of federal agencies representatives [106] developed the Eco-Logical Report, a guide that "describes ways to make more efficient and effective the governmental processes needed to advance infrastructure projects – in compliance with applicable laws – while maintaining safety, environmental health, and effective public involvement".[107] The Eco-Logical Report presents a compelling discussion of the need for, and importance of, adopting an integrated planning approach that addresses mitigation options from a multi-agency perspective. The Eco-Logical Report also "attempts to provide a method for the

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[101] *Id.* at 2.
[102] *Id.* at 17-18, 23.
[103] Performance Improvement in the Review and Permitting of Renewable Energy Infrastructure Projects: The Department of Defense's Plan, *available at* http://www.acq.osd.mil/dodsc/library/Agency%20Plan%20-%20final%20may%202013.pdf.
[104] Department of Defense Siting Clearinghouse: Fact Sheet, *available at* http://www.acq.osd.mil/dodsc/library/dodsc-fact-sheet.pdf.
[105] http://www.acq.osd.mil/dodsc/library/drecp-moa-dec-2011.pdf.
[106] Representatives of the following agencies contributed for developing the Eco-logical Report: Bureau of Land Management (BLM), U.S. Environmental Protection Agency (EPA), Federal Highway Administration (FHWA), National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries Service), National Park Service (NPS), U.S. Army Corps of Engineers (USACE), U.S. Department of Agriculture Forest Service (USDA FS), U.S. Fish and Wildlife Service (USFWS), the Volpe National Transportation Systems Center, the Knik Arm Bridge and Toll Authority, and several State Departments of Transportation (DOT), including North Carolina DOT, Vermont Agency of Transportation, and Washington DOT.
[107] JANICE W. BROWN, ECO-LOGICAL: AN ECOSYSTEM APPROACH TO DEVELOPING INFRASTRUCTURE PROJECTS (2006), *available at* http://www.environment.fhwa.dot.gov/ecological/ecological.pdf.

collection, sharing, analysis, and presentation of data contained in agencies' plans," and stresses the importance of utilizing "performance measures, monitoring, and adaptive management" in order "ensure that work is being done eco-logically."

The Department of Transportation's long-standing involvement in mitigation issues flows from Section 4 (f) of the Department of Transportation Act of 1966[108] which required that transportation projects seek to "minimize harm" to any "park, recreational area, wildlife and waterfowl refuge, or historic site." Section 4(f) was subsequently amended in 1968 and 1983, but the most substantive amendment occurred in 2005, through the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU). [109] The provision sets the tone for DOT in emphasizing that environmental and cultural harms to sensitive landscapes should be avoided, and that planning processes should be utilized to address environmental needs:

> "The Secretary may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) [of the United States Code, "Federal Lands Highways Program"] requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if—
> (1) there is no prudent and feasible alternative to using that land; and
> (2) *the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use*."[110]

The most recent DOT authorization was enacted in 2012, through the Moving Ahead for Progress in the 21st Century Act, commonly referred to as "MAP-21," which replaced SAFETEA-LU. Like its predecessor statutes, MAP-21 includes clear obligations that DOT take its mitigation obligations seriously, and that it preferentially seek to develop mitigation plans on a landscape-scale – the same type of approach that is discussed throughout this paper. The statute notes that federal agencies responsible for environmental reviews, permits, or approvals for transportation projects should follow, where possible, "a programmatic mitigation plan" when implementing NEPA's mitigation obligations. According to MAP-21, "programmatic mitigation plans may be developed on a regional, ecosystem, watershed, or statewide scale." Such plans "may be integrated with other plans, including watershed plans, ecosystem plans, species recovery plans, growth management plans and land use plans."[111]

MAP-21 provides further elaboration on its recommendation that agencies integrate planning and environmental reviews for transportation projects. It states that planning analysis should include studies regarding "(…) (E) natural and built environmental

[108] 23 U.S.C. § 138 (2011); 49 U.S.C. § 303.
[109] 23 U.S.C. § 139.
[110] 49 U.S.C. § 303(c).
[111] 23 U.S.C. § 169.

conditions; (F) environmental resources and environmentally sensitive areas; (G) potential environmental effects, including the identification of resources of concern and potential cumulative effects on those resources, identified as a result of a *statewide or regional cumulative effects assessment*; and (H) mitigation needs for a proposed action, or for programmatic level mitigation, for potential effects that the Federal lead agency determines are *most effectively addressed at a regional or national program level."*[112] Planning decisions should include "(…) (E) an identification of *programmatic level mitigation for potential impacts* that the Federal lead agency, in consultation with Federal, State, local, and tribal resource agencies, determines are *most effectively addressed at a regional or national program level*, including (i) system-level measures to avoid, minimize, or mitigate impacts of proposed transportation investments on environmental resources, including regional ecosystem and water resources; and (ii) potential mitigation activities, locations, and investments."[113]

Thus, DOT's statutory authorities provide yet another strong indication that Congress is interested in developing mitigation strategies that embrace broad, landscape-scale level solutions. Governing transportation law calls on DOT to engage in planning exercises that look to implement environmental mitigation on a "programmatic level" that evaluates regional needs, in coordination with other federal and state agencies.[114]

H. The Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) issues permits for natural gas pipeline projects, certain types of electric transmission projects,[115] and licenses private hydropower facilities[116] under the authority of the Federal Power Act, as amended.[117] FERC addresses mitigation requirements through the NEPA process that accompanies its permitting activities. Because many of the infrastructure projects in which FERC plays a role also trigger permitting responsibilities from other agencies, FERC is well positioned to adopt a multi-agency, landscape-scale approach to addressing mitigation requirements, in close coordination with other agencies. Indeed, such an approach may reduce the friction that traditionally has developed between FERC and other resource agencies in connection with environmental reviews of certain infrastructure projects.

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[112] *Id.* § 168 (b)(2).
[113] *Id.* § 168 (c)(1)(E).
[114] Interestingly, MAP-21 includes a number of provisions that reflect Congress' frustration with the time and complexity associated with the permitting of transportation projects, reinforcing its interest in bringing more efficiency into environmental reviews and interagency coordination. Section 1301 states that it is in the national interest to expedite the delivery of surface transportation projects by substantially reducing the average length of the environmental review process. The law establishes deadlines and timelines for the completion of permitting processes. S*ee* 23 U.S.C. § 139(h), (m) (2011).
[115] FED. ENERGY REGULATORY COMM'N, A GUIDE TO THE FERC ELECTRIC TRANSMISSION FACILITIES PERMIT PROCESS, *available at* http://www.ferc.gov/for-citizens/citizen-guides/electric/guide-transmission.pdf.
[116] *Preliminary Permits*, FED. ENERGY REGULATORY COMM'N, *available at* http://www.ferc.gov/industries/hydropower/gen-info/licensing/pre-permits.asp.
[117] Federal Power Act, 16 U.S.C. § 797 (2011).

Concluding Observations Regarding Underlying Legal Authorities

- Over time, permitting and reviewing agencies have tended to develop their own agency-specific approaches for how they approach and address compensatory mitigation requirements.
- As a result, there has been limited coordination among agencies regarding mitigation. Agencies typically "go it alone" when determining what type of mitigation may be appropriate for infrastructure projects, with the Army Corps of Engineers addressing wetlands impacts, the Fish & Wildlife Service addressing species impacts, and the like.
- The agencies' underlying authorities do not mandate this result. To the contrary, because the agencies' mitigation authorities are framed expansively in underlying statutes, a multi-agency mitigation approach based on regional, landscape-scale planning exercises that incorporate broadly applicable environmental criteria, potentially could satisfy all agencies' compensatory mitigation needs.
- The legal analysis indicates that the underlying statutes are not overly prescriptive in how compensatory mitigation should be implemented. Indeed, given the broad language used in the relevant laws, including their emphasis on advancing the health of wetlands, species habitat, and other environmental values, as well as their focus on integrating mitigation with sound planning exercises, it appears that the underlying laws would support a multi-agency, multi-authority planning-based approach to identifying environmentally important landscapes in a region.

> *It may be prudent to develop multi-agency, joint guidance that lays out the policy and legal underpinnings of a comprehensive compensatory mitigation strategy. Alternatively, a separate regulatory path adopting a multi-agency compensatory mitigation approach that adopts broadly applicable environmental criteria could be codified in jointly released regulations under several applicable statutes.*

IV. UNDERTAKING LANDSCAPE-SCALE MITIGATION PLANNING WITH BROADLY APPLICABLE ENVIRONMENTAL CRITERIA

To actuate this innovative approach, it would be ideal if the same group of agencies that are responsible for evaluating the environmental harms associated with infrastructure projects and approving compensatory mitigation remedies would develop and apply broad-based criteria that could be used as the basis for cross-agency mitigation investments on regionally significant landscapes. This section explores the type of criteria that might be developed for such a purpose. It then reviews a number of promising initiatives that are test-driving some of these approaches. The section closes with a recommendation for developing and then applying broad-based criteria that could be used to guide mitigation investments on regionally significant landscapes.

A. Using Multi-criteria Decision Analysis Methods to Create Rigorous, Replicable Decision-making Processes

As noted above, managing landscapes to promote sound social, economic, and environmental outcomes is a goal that is embedded in the authorizing legislation of federal land management and other resource agencies.[118] State and local authorities typically pursue similar goals for lands under their jurisdictions. When implementing these sometime-conflicting goals, land and resource managers have come to appreciate that forward planning exercises can improve the decision-making associated with individual project reviews, both with regard to initial siting decisions and, more recently, with regard to optimizing investments in compensatory mitigation that may be required due to unavoidable negative impacts associated with the development of infrastructure projects.

Determining what landscapes should potentially be avoided when siting infrastructure projects and, alternatively, what landscapes should be prioritized for restoration and/or conservation purposes, requires making decisions based on multiple, often independent criteria of interest, not all of which can be simultaneously optimized.

A common tool for making decisions based on multiple goals is known as "Multi-criteria Decision Analysis," or MCDA. MCDA relies on two major components: a set of criteria that a decision maker seeks to optimize and a set of priority weightings that the decision-maker will use to make tradeoffs in a consistent manner. For example, a land manager might be interested in making a decision that will protect local species and water quality while allowing energy production at a low cost. Then, the criteria are measures of species protection, water quality, energy production, and cost. The priority weightings are explicit measures of how important one measure is over another, often taking the form of either a prerequisite threshold value (that is, a project will be vetoed if a minimum water quality is not met) or a multiplier that emphasizes one criterion over another in a relative manner.

Defining the criteria of interest can be relatively straightforward as long as all relevant actors are involved in criteria selection. For example, a nongovernmental organization focused on protecting a particular species' habitat might propose excellent criteria related to habitat preservation while ignoring environmental justice indicators like concentration of industrial sites in a particular region: in that situation, making decisions based purely on the NGO's recommendations introduces implicit biases about relative value. Often, particularly in nonformalized decision-making processes, these criteria might not be explicitly identified, which makes decision replication and transparency significantly more difficult.

Whether explicitly or implicitly, determining relative value – how to value one type of outcome over another – is very challenging. Often, weighting factors associated with such criteria are not identified or are inconsistently applied. A frequent default outcome is to assume that all criteria are equally important, with additional complications arising from the challenge of comparing criteria measured on different scales to each other. For

[118] *See supra* Part II for a discussion of legal authority.

example, comparing the concentration of heavy metals in water to the number of birds present on a parcel of land requires a value judgment about how those disparate units can be compared. Since priorities often compete with one another, these weightings and value judgments can be critical to land and resource management outcomes.

The academic literature on MCDA is instructive in reviewing issues pertaining to decision-making. Some of these lessons can be considered in light of siting and mitigation decisions by agencies that are pursuing broad-based mandates such as the BLM's, to manage "the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people" in a consistent, defensible manner (FLPMA 1976). For the BLM -- America's largest landowner, -- the (many) multiple criteria that federal land managers must consider are formalized by law.[119] However, the priority that one criterion takes over another and the specific metrics used to establish how well a given option fulfills these criteria is somewhat discretionary and might be able to be informed by prior research and past experiences.

In their review of MCDA in environmental decision making, Kiker et al note that decision-makers tend to use four major types of information: technical studies, risk assessment, cost-benefit analysis, and stakeholder preferences.[120] Typically, these types of decisions are made in multidisciplinary groups that might or might not be fully representative of the range of actors involved with a resource, which creates challenges in determining whether the priorities used are the true public priorities that need to be incorporated into decisions. Additional MCDA-related challenges include how priorities are set,[121] how criteria are converted to a scale that enables direct comparison across highly diverse issues,[122] and how data compression is handled.[123]

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[119] *See, e.g.*, BUREAU OF LAND MGMT., LAND USE PLANNING HANDBOOK (H-1601-1) (Mar. 11, 2005), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/planning/planning_general.Par.65225.File.dat/blm_lup_handbook.pdf ("The public lands must be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use by encouraging collaboration and public participation throughout the planning process. In addition, the public lands must be managed in a manner that recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands.").

[120] Gregory A. Kiker, et al., *Application of Multicriteria Decision Analysis in Environmental Decision Making*, 1:2 INTEGRATED ENVTL. ASSESSMENT AND MGMT 95 (2005).

[121] Setting priorities is often a question not only of who is involved but also of whether decision-makers have sufficient technical information to accurately understand why one issue is prioritized over another.

[122] Directly comparing data on diverse outcomes is also challenging. One common technique is to attempt to express criteria using common units, such as dollars of impact or constructed aggregate units of total environmental or social impact. However, converting to these proxy units requires additional implicit value judgments that are method-, data-, and user-dependent. Another approach is to normalize values in their native units, so that the highest possible value for each

B. Promising Initiatives that are Developing Broad-Based Environmental Criteria on a Landscape Scale

There are a number of significant efforts underway in several agencies to develop Multi-criteria Decision Analysis approaches for compensatory mitigation planning and execution that could provide the basis for a broad-based, multi-agency compensatory mitigation approach. Several prominent case examples are presented in the paragraphs that follow.

1. Bureau of Land Management's Rapid Eco-regional Assessments

The BLM's Rapid Eco-regional Assessments (REA) program, initiated in 2010, focuses on quickly aggregating existing data to categorize land in 13 eco-regions over a period of about 18 months (versus the more typical study length of 36-48 months). REAs collect information about regionally important habitats for fish, wildlife, and species of concern on public lands under BLM management, with specific attention to the likely influences of four major change agents: climate change, wildfire, invasive species, and development. REAs are specifically designed to provide data and background information to decision-makers rather than to express decisions, so they form a partial basis for the parameters but not weightings in a multi-criteria decision analysis framework. Notably, the REAs focus on identifying both areas that should be prioritized for conservation or restoration and areas that should be prioritized for development due to a lack of ecologically important characteristics[124].

REAs rely on existing data, which is partially why they have proceeded more quickly than typical assessments. They are designed to be updated as new data become available.[125] Specific data sets are chosen during the assessment process and therefore

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criterion is expressed equivalently (e.g. a 0 to 1 scale, where 0 is lowest value and 1 is highest value). However, normalizing not only has some of the same value judgment issues as proxying but also appears to eliminate this issue, making results look more objective than they necessarily are. This challenge is due to the nature of sensitivity to different signals: for example, a linear compression that expresses a metric as a fraction of the highest possible value will misrepresent the relevance of values where the important indicator is whether the value exceeds a threshold. Also, it is very difficult to define "highest possible" harms in a consistent way.

[123] Data compression is a problem associated with any decision that ultimately ranks options in terms of preference, essentially reducing a large amount of information about a place or an option to a single value. The problem is often due to a lack of information on how the rich data set was converted to a value, however. A transparent MCDA process where the priority weightings are clear, based on an articulated process, and consistently applied can reduce issues with data compression, but only if it is well designed. In situations where there are real concerns about the quality of decision making and prioritization, it can be useful to consider a criterion like decision reversibility in the process.

[124] *Id.*

[125] *REA Data Disclaimer*, BUREAU OF LAND MGMT., *available at* http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas/datadisclaimer.html.

vary by eco-region, but some examples include LANDFIRE, USGS and other agency data, and academic publications.[126]

While there is limited literature addressing the successes and gaps espoused by the REAs (as the first publication was released in February 2013),[127] the REAs appear to add value by synthesizing existing environmental information about eco-regions without imposing large costs. The BLM explicitly involved federal and state managers and technical experts from individual eco-regions during preparation of the REA,[128] thereby intending to lessen the bias associated with single-agency work.

One acknowledged gap is that REAs address only nonhuman species habitat quality, so they exclude some important social criteria such as cultural resources, environmental justice, and economic potential that can be critical during a real decision-making process. This focus on habitat is very similar to that of The Nature Conservancy (TNC)'s earlier efforts (also called eco-regional assessments, conducted between 1999 and 2004),[129] which follow an approach laid out by its experience-based 2000 handbook "Designing a Geography of Hope: A Practitioner's Handbook to Eco-regional Conservation Planning (Second Edition)."[130] One interesting aspect of TNC's approach is the use of efficiency-weighted prioritization, where alternatives with low economic, socio-political, and land use opportunity cost burdens as defined by an algorithmic suitability index are prioritized for conservation.

Given that the BLM is a public agency dedicated to promoting multiple use rather than an NGO dedicated to habitat preservation like TNC, BLM does note that other criteria need to be considered before management decisions are made.[131] For now, BLM relies on other sources like the Economics Profiling Systems[132] and others for economic considerations and is including cultural resources criteria as pilot efforts in some of the ongoing REAs.[133] Federal or state efforts to mitigate harm to both human and nonhuman ecologies should consider addressing a seemingly unfilled gap in the form of criteria

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[126] *Data Catalog for the Central Basin and Range REA*, BUREAU OF LAND MGMT. (2013), http://www.blm.gov/pgdata/etc/medialib/blm/wo/Communications_Directorate/public_affairs/landscape_approach/documents1.Par.63562.File.dat/CBR_REA_Data_Catalog.pdf.

[127] *Status and Schedule*, *Rapid Eco-regional Assessments*, BUREAU OF LAND MGMT., *available at* http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas.html.

[128] *How REAs are Prepared*, *Rapid Eco-regional Assessments*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas.html.

[129] Center for Science and Public Policy, *Eco-regional Assessment Reports & Data*, THE NATURE CONSERVANCY, http://azconservation.org/downloads/category/eco-regional_assessment.

[130] CRAIG GROVES, ET AL., THE NATURE CONSERVANCY, 1 DESIGNING A GEOGRAPHY OF HOPE: A PRACTITIONER'S HANDBOOK TO ECO-REGIONAL CONSERVATION PLANNING (2d ed. 2000), *available at* http://www.denix.osd.mil/nr/upload/Geography-of-hope-handbook-Vol-I-02-136.pdf.

[131] *Questions and Answers: Rapid Eco-regional Assessments (REAs)*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas/assessmentsqa.html.

[132] *Economic Profile System – Human Dimensions Toolkit*, HEADWATERS ECONOMICS, http://headwaterseconomics.org/tools/eps-hdt.

[133] *Questions*, *supra* note 134.

regarding impacts to existing human communities, like overall environmental burdens from development.

2. Landscape Conservation Cooperatives

Another initiative by the Department of the Interior that could be informative to something like the REA effort is the Landscape Conservation Cooperatives (LCCs) program, launched in 2009. The LCCs focus on landscape management that can facilitate smart oil, natural gas, coal, solar, wind, biomass, and geothermal development decisions while protecting water, land, fish and wildlife, cultural heritage, and tribal lands and resources, all within the context of climate change[134] and other pressures that are affecting the environmental integrity of landscapes -- thus beginning to incorporate both environmental outcomes and non-extractive social outcomes. While the LCCs still do not explicitly focus on broader measures of socioeconomic outcomes, they are based on broad community and stakeholder-based input regarding regionally significant landscapes.

3. Maryland Watershed Resources Registry

The Maryland Watershed Resources Registry (WRR) seeks to moves mitigation efforts away from a stovepipe approach, towards a comprehensive watershed view.[135] It was created from a partnership of agencies (listed below), which developed a framework for integrated watershed management in order to streamline both regulatory and non-regulatory processes to improve permitting efficiency.[136] The WRR was developed to streamline information collection and dissemination for permit processes and to prioritize watershed needs. The WRR interagency team developed a geographic information system (GIS) tool (released in late 2012) to map natural resource areas that are a priority for preservation and to identify sites best suited for ecosystem preservation and restoration.[137]

More specifically, the WRR locates and evaluates the suitability for protection or restoration of wetlands, uplands, streamside areas, and storm water-infrastructure areas. The tool analyzes watersheds and identifies the best opportunities for the protection of high-quality resources, restoration of impaired resources, resource conservation and environmental resource planning, and improvement of storm water management. Through these efforts, the WRR is intended to integrate the Clean Water Act (CWA) authorities by facilitating implementation of CWA Sections 319, 401, 402, and 404, TMDL implementation practices, and multiple state programs. The datasets

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[134] Dep't of Interior, Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources, Secretarial Order 3289 (Sept. 14, 2009), *available at* http://www.doi.gov/whatwedo/climate/cop15/upload/SecOrder3289.pdf.
[135] WATERSHED RESOURCES REGISTRY, http://watershedresourcesregistry.com/home.html (last visited Dec. 4, 2013).
[136] *Frequently Asked Questions*, WATERSHED RESOURCES REGISTRY, http://watershedresourcesregistry.com/faqs.html (last visited Dec. 4, 2013).
[137] *Historical Timeline*, WATERSHED RESOURCES REGISTRY, http://watershedresourcesregistry.com/History.html (last visited Dec. 4, 2013).

include CWA requirements in the scoring rubric for each analysis. For example, Clean Water Act Sections 303 and 305, covering water quality standards, monitoring, and TMDLs, are reflected in the ranking of sites. Locations are scored based on the designated use of nearby streams and on whether or not the site is near an impaired stream. These factors are included in all eight opportunity analyses.

The tool also provides permit applicants an easy way to identify priority natural resource areas in the planning phase before the review process is initiated. Since numerous federal and state agencies have inserted their priorities into the WRR, permit applicants can use the WRR to take these priorities into account when identifying potential development sites.

In addition, the WRR can help identify areas that are good development sites that do not implicate or compromise important watershed values. Hence, private developers can use the WRR to guide their land use decisions and mitigation requirements so that they can make timely and cost-effective decisions based on watershed-specific data. The tool also is intended for use by public land trusts and wetland bankers to target areas for purchasing and preserving. At the local level, the WRR provides access to state and federal natural resource expertise that could otherwise be difficult to compile. County planners can use the tool to inform resource protection measures, open space networks, zoning, and comprehensive land use plans.

The WRR uses science-based criteria to measure ecological health. The interactive-mapping tool uses a five-star scoring system to rate different watershed areas with the goal of channeling conservation efforts toward lands and waters with the highest ecological value. To accomplish this task, the WRR pinpoints specific sites for mitigation based on eight models for different types of ecological opportunities that developers can use to identify mitigation sites (e.g. upland preservation, upland restoration, wetland restoration, riparian preservation). Each of these models, called suitability analyses, has its own set of particular criteria (determined by regional experts) that were used to develop the output. The WRR divides each analysis into absolute factors and relative factors when evaluating a site's potential for mitigation. Absolute factors are required or prohibited physical characteristics. These determine the basic suitability of a location for a given project category. Relative factors are preferred physical characteristics and federal and state agency priority areas. If a site was deemed suitable given the absolute factors, the relative factors were then summed to assign a score to each site.

For example, the upland restoration suitability analysis is designed to map and score those areas where the natural upland ecosystem remains substantially intact and healthy. To accomplish this task, it selects absolute factors regarding which areas to map and score. It only examines those areas that are not already protected, are not wetlands or open water, and do not already contain commercial, institutional, high or medium density residential, or transportation developments. It then assigns scores of 1 to 5 to lands using relative factors, such as whether the land is within 400 feet of a protected area or whether

it is forested. To address ESA concerns, these relative factors include the prioritization of sites with rare or endangered species habitat.

By turning data layers on and off, a developer can determine where a special ecological interest is located within a watershed and identify watershed appropriate mitigation opportunities in the surrounding area. After finding opportunity sites of interest, a developer can export and print the GIS-results to conduct a field visit where she can ground-truth the potential site. Others represent preferred conditions and agency priorities. For instance, to identify upland preservation opportunities, developed land was excluded, but land in a Maryland Tier II/High Quality watershed received one point. Therefore, sites that are physically better are ranked higher, as are those that meet more agency priorities. Other datasets, such as the one identifying areas that drain into a water quality-impaired stream, highlight the needs of a watershed. Incorporating these types of factors allowed for the watershed approach to be considered when prioritizing sites.

The WRR exemplifies how a mitigation tool might be scaled to provide the backdrop for a larger mitigation program. In spring 2010, the WRR team originally restricted its GIS-models to a pilot area consisting of four eight-digit HUCs. By late 2012, the GIS-tool was expanded to cover the entire State of Maryland. EPA is now attempting to determine how the Registry might be expanded for nationwide application. Applying the process nationally is facilitated by the fact that in building the GIS-tool, the WRR collected and amalgamated data from numerous national datasets.

The process for compiling the WRR provides a potential best practice. The development of the WRR arose from an Interagency Group, including: the Baltimore District Army Corps of Engineers, Headquarters Army Corps of Engineers, US Environmental Protection Agency Region 3, US Fish and Wildlife Service, Federal Highway Administration, Maryland State Highway Administration, Maryland Transportation Association, National Marine Fisheries Service, Maryland Department of Natural Resources, Maryland Department of the Environment, Charles and Prince George's Counties, and NGOs (e.g. the Conservation Fund). The WRR thus involved collaboration between regulatory and non-regulatory agencies, as well as between federal and state agencies. The group met to determine the opportunity analyses that could be conducted and which would be most valuable. They also deliberated over which factors would be included in each analysis and how they would be scored. Once the analyses were finalized, the group decided how best to disseminate and display the information. To encourage public input, the WRR created a survey to solicit feedback on its GIS-based tool.[138] The contributions from each agency and from public stakeholders indicate their commitment to developing a robust tool that satisfies all stakeholders' needs.

Two tables illustrating the operation of the WRR are attached as an exhibit to this paper.

4. BLM's Dry Lake Pilot Project

[138] *Feedback*, WATERSHED RESOURCES REGISTRY, http://watershedresourcesregistry.com/feedback.php (last visited Dec. 5, 2013).

Traditionally, the BLM has identified mitigation requirements on a case-by-case basis. For large infrastructure projects, including some large oil and gas projects and transmission, the BLM has tended to discount or overlook certain unavoidable environmental impacts of such projects. It does not have a consistent history, for example, of requiring large footprint projects to compensate for the fragmentation and other unavoidable adverse impacts that the introduction of such projects can have on a landscape.

In recent months, the BLM has been reexamining its approach to mitigation. As noted above, the Agency released a significant new Interim Policy, *Draft - Regional Mitigation* Manual Section - 1794, which seeks to regularize how it will address compensatory mitigation.[139] Also, in connection with the BLM's planning exercise for solar development in the six southwestern states (the "Western Solar Plan," implemented through a Programmatic Environmental Impact Statement and accompanying Record of Decision[140] prepared by the BLM and the U.S. Department of Energy),[141] the BLM recommended that "regional mitigation plans" be developed to facilitate the thoughtful application of mitigation associated with the siting of major solar projects in new "solar energy zones" (SEZs) in the region.[142]

As set forth in the Western Solar Plan, regional mitigation plans should be responsive to the following key questions: (1) What are the unavoidable impacts associated with the development of the SEZ? (2) Which unavoidable impacts should the BLM require off-site mitigation for? (Which impacts represent significant threats in the region? Are there ways to avoid and/or minimize these unavoidable impacts?) (3) What are the mitigation objectives? (4) What mitigation projects/actions will be undertaken to offset the selected impacts, and where will they occur? (5) How will the mitigation actions be implemented? (e.g., What are expected costs of mitigation actions and how will these costs be equitably allocated to streamline and incentivize SEZ solar right-of-way permitting?) (6) How will the outcomes of the mitigation actions be monitored, and what will happen if they are not achieving the desired results?[143]

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[139] Bureau of Land Mgmt., Instruction Memorandum No. 2013-142, Interim Policy, Draft - Regional Mitigation Manual Section – 1794 (June 13, 2013), *available at* http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-142.html.

[140] BUREAU OF LAND MGMT., APPROVED RESOURCE MANAGEMENT PLAN AMENDMENTS/RECORD OF DECISION (ROD) FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES (Oct. 12, 2012), *available at* http://solareis.anl.gov/documents/docs/Solar_PEIS_ROD.pdf.

[141] BUREAU OF LAND MGMT. & U.S. DEP'T OF ENERGY, FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (PEIS) FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES (FES 12-24; DOE/EIS-0403) (July 2012), *available at* http://solareis.anl.gov/documents/fpeis/Solar_FPEIS_Volume_6_Part_1.pdf.

[142] *See id.* at Appendix A.2.5.

[143] Bureau of Land Management, *Solar Regional Mitigation Planning Frequently Asked Questions*, Oct. 2012, http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/dry_lake_sez.Par.3790.File.dat/FAQs%20Oct2012.pdf.

The BLM anticipates that by developing regional mitigation plans for SEZs, it will facilitate the permitting process by enabling the ready identification of compensatory mitigation for new solar projects. Some additional NEPA reviews will be required however, insofar it is not expected that the regional planning will be NEPA-based.[144]

The BLM has initiated a pilot project to develop the first solar regional mitigation plan (SRMP) to accompany a solar energy zone. More specifically, the BLM Southern District of Nevada Office is overseeing this pilot project for the Dry Lake Solar Energy Zone (SEZ) in Nevada, pursuant to the Western Solar Plan's Record of Decision.[145] The Dry Lake SEZ SRMP Pilot Project is an analysis of a Solar PEIS created by the BLM in response to public comments from 2010 to 2012.[146] The Pilot Project will build on the Regional Mitigation Planning Framework and Solar Long-term Monitoring Program.[147]

In addition to developing a regional mitigation plan, the BLM is using the Dry Lake Project to identify lessons learned and best practices that will be applied when developing additional regional mitigation plans to accompany solar energy zones throughout the west. To that end, the BLM expects to use the lessons learned from Dry Lake Project to publish a report entitled "Guidance and Recommendations for SEZ Regional Mitigation Planning"[148] which it is currently in the process of finalizing.[149]

In connection with its development of the Dry Lake plan, the BLM has taken several factors into consideration when determining how unavoidable impacts of development can be most efficiently and effectively mitigated off-site. In particular, the BLM considers the condition and trend of appurtenant ecological, social, and/or economic values and systems, where these systems are most at risk, and the BLM's resource management goals.[150] It then considers the relative risks posed by development occurring in the solar energy zone on these systems. Lastly, it calculates the degree to which lands and resources, if protected and/or restored, would most efficaciously mitigate the unavoidable adverse impacts of development.[151]

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[144] *Id.* at 8.

[145] This is the aforementioned Record of Decision based on the Programmatic Solar Environmental Impact Statement prepared for six southwest states.

[146] Solar Energy Devpt. Programmatic EIS Information Center, *Final Solar Devpt. Programmatic Environmental Impact Statement (Solar PEIS)*, July 2012, *available at* http://solareis.anl.gov/eis/studies/index.cfm

[147] These were proposed and published in the Solar PEIS Appendices 2.4 and 2.5. *See* http://solareis.anl.gov/documents/fpeis/index.cfm

[148] Bureau of Land Management, Framework & Action Plan for developing a Regional Mitigation Plan for the Dry Lake Solar Energy Zone (SEZ), Oct. 2012, http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/dry_lake_sez.Par.25994.File.dat/Framework%20and%20Action%20Plan.pdf

[149]Bureau of Land Management, Dry Lake SRMP Schedule for Stakeholders, Apr. 8, 2013, http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/dry_lake_sez.Par.46273.File.dat/SRMP.Schedule.for.Stakeholders.RevApr.9.2013.pdf.

[150] See Bureau of Land Mgmt., Framework & Action Plan, *supra* 148, at 5.

[151] *Id.*

To increase the transparency of the Pilot Project, BLM Dry Lake has compiled an extensive collection of project data and methodology documents, which it has made available to the general public on its website.[152] The BLM also has been communicating with the public via news releases, as well as e-mails to a Solar PEIS subscriber list and a workshop participant list. The BLM has also engaged stakeholders through various workshops and webinars, which it has published online.[153] The Bureau also plans to consult with Indian tribes, SHPOs, and the ACHP to devise more effective methods to solicit and consider tribal views on the effects of solar energy development on historic properties, traditional cultural properties, landscapes, and resources important in traditional tribal practices and beliefs.[154]

5. Sunrise River Special Area Management Plan

The U.S. Army Corps of Engineers St. Paul District, with technical support from the Corps' Engineering Research and Development Center, is currently developing a participatory GIS Spatial Decision Support System (SDSS) to prioritize compensatory wetland mitigation sites in the Sunrise River, using a watershed approach.[155] The SDSS provides a unique example of how stakeholder input and watershed assessments can be used to determine watershed conservation priorities and priority sites for wetland restoration and enhancement.

The SDSS involves a four-phase process: (1) completion of a baseline assessment of watershed conditions, (2) engagement of a stakeholder group to identify watershed needs and a set of weighted spatial factors that could be used to address those needs based on this assessment, (3) development of a GIS-based model to create maps of priority wetland restoration sites and, (4) development of an implementation strategy for the priority sites identified.[156]

The goal of the project is to construct a weighted GIS map that reflects stakeholder input on watershed priorities and to use feedback from stakeholders on the GIS outputs to generate an implementation strategy.[157] In a series of workshops, a stakeholder team, which includes representatives from EPA, MNPCA, MNDNR, MNBSW, and local agencies responsible for implementing the Minnesota Wetland Conservation Act, collaborated to develop a framework for selecting mitigation sites that would best meet watershed needs. This process, which was administered by the Corps, involved three

[152] Bureau of Land Management, Dry Lake Solar Energy Workshops, May 2013, http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/dry_lake_solar_energy/past_workshops.html.
[153] *Id.*
[154] *See* Record of Decision, *supra* note 140, at B.4.2.6.
[155] Environmental Law Institute, U.S. Army Corps of Engineers St. Paul District Sunrise River Watershed-Based Mitigation Pilot Study Spatial Decision Support System, May 8, 2012, http://www.eli.org/pdf/wetlands/Factsheets/USACE_SRWBMP_FactSheet.pdf
[156] *Id.*
[157] *Id.*

phases.[158] First, the team identified vulnerability priorities for mitigation projects using a baseline analysis that had been prepared by the Corps. It then identified the criteria it considered most important for targeting wetland compensation mitigation efforts within each subwatershed. These criteria included hydrologic connection to tributaries, land costs, potential to reconnect riparian buffers, potential beneficial effects on fisheries, and threats from urban growth. Next, stakeholders completed a survey in which they ranked selected criteria against one another in a series of dyadic comparisons. Survey results were used to assess the overall importance of each criterion to the group as a whole using a type of Multi-Criteria Decision Analysis (see discussion of MCDA, above). These importance ratings were then used to determine the weightings to use for each criterion as part of the SDSS model. The survey was completed online, rather than as a group, to minimize bias and avoid concerns related to groupthink.[159]

The SDSS model is intended to provide state and local agencies with a repeatable approach for watershed planning for compensatory wetland mitigation. The SDSS could additionally inform site selection by applicants to the U.S. Department of Agriculture Natural Resources Conservation Service Wetland Reserve Program and other governmental and non-governmental entities pursuing aquatic resource restoration within the watershed. Ultimately, the pilot project is intended to produce an approach that could be reapplied to watersheds nationally.

The Sunrise River project highlights some of the challenges involved in implementing a mitigation planning exercise with multiple agencies. Several local governments within the watershed administer the state Wetland Conservation Act. Each local government has individual obligations under state law and preferences for mitigation siting within its geographic areas of responsibility. And because the Sunrise River watershed encompasses multiple local jurisdictions that independently implement the state Wetland Conservation Act, creating incentives to apply the prioritization throughout the entire watershed may be difficult unless the federal and state wetland permitting agencies seek to align their regulatory practices.

The Sunrise River project also underscores the difficulty of creating GIS-based tools that directly help developers comply with various federal and state environmental laws governing mitigation. For instance, an original goal of the Sunrise pilot project was to integrate Section 404 CWA mitigation (as the WRR does) with the Sunrise River watershed Total Maximum Daily Load (TMDL) plan. However, the Corps did not receive timely input from the Minnesota Pollution Control Agency regarding selection criteria that the SDSS could use to prioritize wetland mitigation that supported TMDL water quality objectives. Consequently, the current GIS-based tool does not yet integrate CWA Section 404 mitigation requirements.

6. Crucial Habitat Assessment Tool

[158] *Id.*
[159] *Id.*

The Crucial Habitat Assessment Tool (CHAT) is an instrument created by the Western Governors Association (WGA) to identify important habitats and wildlife corridors in the American West. Inherently, these large habitats and corridors lay across political jurisdictions. The practical implication of that geographic fact is that multijurisdictional coordination is necessary to adequately protect those areas. The CHAT tool was created to help relevant jurisdictions and authorities jointly plan to protect these important landscape features.

CHAT is a powerful decision support tool for policy makers to plan infrastructure development in a way that is sensitive to regional ecologies. Different habitats, corridors or other areas are coded visually on a map for policymakers to easily identify which areas are most crucial or least crucial for a given priority. In creating the CHAT tool, states agreed upon broad environmental priorities and submitted relevant data supporting those individual values. The states then hide wide latitude to submit the data to each environmental value category that they felt was most relevant to their lands.

CHAT divides the WGA territory into smaller parcels of land. Based upon the state data for respective land parcels, CHAT weighs the habitat value of that parcel from on a scale of 1-6 (with 1 being the most crucial and 6 being the least crucial). The primary tier, called Crucial Habitat Input Layers, consists of data for the following environmental values: Habitats for Species of Concern, Important Connectivity Zones, Large Intact Blocks, Landscape Condition, Riparian Habitat Distribution and Species of Economic and/or Recreational Importance. Subsequent data layers may provide greater granularity of scientific data including the Boundaries of Watershed and Sub-watershed areas as well as Protected Areas.

Each parcel of land receives a rank for each environmental value, which produces the overall CHAT score of 1-6. Some parcels of land may receive a 1 for being the habitat of an important species of concern, but a 6 for the category of "large intact block" because developments have already cleaved it into two pieces.

As a visual aid, CHAT allows decision makers to toggle through the various environmental values. For example, if siting a specific project, CHAT allows decision makers to display first tier inputs relative to the CHAT score. The benefit of overlaying that information onto the CHAT map is that the decision maker can determine whether that specific project would be particularly well or ill suited to a specific area. Because the states have already agreed upon priorities, the CHAT map displays a collective, data driven, judgment about land parcels and regions. The decision maker then works within that framework, digging deeper and deeper into the data, to reach a result that hopefully comports with the WGA's priorities. This is the power of CHAT.[160]

As we think about how to scale coordination among agencies, CHAT is an excellent model for the sort of tool that could underwrite a common approach for permitting agencies in the process recommended in this document. The specific tier 1 data layer of CHAT may be relevant as environmental inputs for the purposes of advanced mitigation

[160]https://westgov.adobeconnect.com/_a976899620/p4d2r5buu1a/?launcher=false&fcsContent=true&pbMode=normal

planning. For example, the category that measures the intactness of land ("Large Intact Blocks") might reveal areas where mitigation dollars should flow to protect. This could be useful both in determining where to avoid siting projects and where to channel mitigation dollars. Furthermore, "Landscape Condition" represents another important environmental value for the purposes of creating effective environmental mitigation.

It is important, however, to remember that in creating environmental values for the purposes of the CHAT score depended as much upon defining those broad categories as it did upon deciding what data would be used to produce the category itself. This was a decision that was left to the individual states. Therefore, two land parcels with the same score, but in different states may not be fully similar. That may be a good thing since certain states may have distinct ecologies, which make certain data more or less applicable. CHAT would be a powerful tool for permitting agencies for the purposes of developing advanced project mitigation. It should be noted, however, that tools like CHAT have some limitations if they rely completely on the ranking of ecological values, and do not take into consideration other criteria that may be important, including such factors as environmental justice, sociocultural and economic issues. As discussed below, we recommend that a task force of federal scientists and policy experts, working with state authorities and other key stakeholders, develop a set of agreed-upon criteria for identifying landscapes that merit mitigation attention.

C. Developing an Effective Inter-Agency Process to Engage in Advanced Mitigation Planning

For all of the reasons discussed above, well-executed and responsible advanced mitigation planning presents an important opportunity to streamline the multiagency permitting process for large infrastructure projects. Initial efforts are underway, with important initiatives such as BLM's Rapid Eco-regional Assessment Program and the Western Governors' Crucial Habitat Assessment Program.[161] One of the essential elements needed to broaden out the concept of advanced mitigation planning for application across a variety of permitting agencies is an effective interagency planning and implementation effort. The challenge for ex ante mitigation planning is how to scale multiagency coordination and create a durable advanced mitigation process anchored by state and federal agencies.

The core of the challenge is: how can various agencies with different planning, permitting and institutional objectives be encouraged to work together to agree upon, and then apply, common criteria that will identify environmentally important landscapes in regions in which infrastructure projects are moving forward? In addition, how can these federal

[161] In California, authorities have implemented the Regional Advanced Mitigation Program (RAMP). RAMP is a partnership of various agencies, researchers and nongovernmental organizations. These groups gathered to work out a streamlined approach to provide for the compensatory mitigation of environmental impacts from various infrastructure projects. The core logic is that mitigation planning is most effective when conducted on a regional basis. Therefore, the goal of the program is to identify regional environmental needs in order to plan mitigation exercises before specific project development is even underway. The RAMP program envisions using groups of local and state stakeholders to carry out this important task.

agencies reach out to states, communities and other stakeholders and confirm that compensatory mitigation investments are being applied to regionally important landscapes and, where possible, are being leveraged with investments from other sources?

Successful ex ante mitigation requires that permitting and reviewing agencies approach the process with the same analytical framework. The most durable interagency coordination model would draw together influential scientific and policy decision makers from the relevant permitting and reviewing agencies and task them with reaching consensus on criteria that can be used to rate the relevant values of different types of landscapes. Based on this evaluation, priority areas that can be targeted for regional compensatory mitigation dollars can be identified, giving permitting agencies a common playbook upon which to determine mitigation-related permit conditions.

We propose a three-step process for consideration. For step one, we recommend building a small task force of scientific and policy experts from federal agencies supported by some state agency experts and NGOs to identify criteria that may be used to identify environmentally important landscapes, based on broad-based measures of watershed health, species and habitat health, climate change and other vulnerabilities, and other relevant factors. We recommend that the task force select criteria based on approaches that already have been developed and field tested, such as those developed under BLM's Rapid Eco-regional Assessments and, for watershed health, criteria such as those developed for the Maryland Watershed Resources Registry. (It would be helpful if the Fish & Wildlife Service could identify similar, broad-based criteria to identify landscapes that manifest species health through the presence of key habitat, important wildlife corridors, or similar criteria.*) It is important that the criteria not be overly detailed or so data dependent that they are impossible, as a practical matter, to apply on a landscape scale. Also, the exercise should be completed over a limited time period, such as six months, taking full advantage of the many initiatives already underway in this arena.*

Once general criteria are identified by the task force, the second step would be to use a planning process – on a pilot basis -- and apply such criteria to specific landscapes in areas in which infrastructure projects are being, or are expected to be, permitted or reviewed. It would be ideal to piggy-back on existing planning processes that may be underway, but to broaden the focus to a truly multi-agency process involving the key permitting and review agencies. It will be particularly important to include key agencies that have statutorily-specific mitigation obligations, such as the Corps of Engineers for wetlands and the Fish & Wildlife Service for endangered species.

The goal of this second step would be to use planning reviews to identify regionally important landscapes that exhibit important environmental values as defined by the broad criteria that the task force has developed. Investment opportunities that will preserve, restore or increase the resilience of such values should be identified. This is where compensatory mitigation monies should be preferentially directed.

Proceeding on a pilot basis is important for the durability of advanced mitigation planning. The piloting process may expose procedural and substantive issues associated with applying the general criteria to specific landscapes. Piloting the advanced

mitigation framework also would create a benchmark for subsequent projects and hopefully produce concrete examples of success to focus upon.

The third step would be to institutionalize these practices by developing guidance that will enable a consistent application of the agreed-upon criteria to specific landscapes, through a planning process. Following joint agency piloting of the practices on representative landscapes, lead agencies should then be encouraged to incorporate these broad-based criteria into on-going planning processes, providing feedback along the way to other permitting and review agencies, as appropriate.

D. The Role of NEPA in Advanced Mitigation Planning

Undertaking a planning exercise to identify potential landscape scale compensatory mitigation opportunities raises a key legal and policy question, namely, whether such a planning process should be completed under the auspices of the National Environmental Policy Act (NEPA). While there is no question that major infrastructure projects that require federal permits will be required to undergo a NEPA review because the permitting decisions will qualify as "major federal actions" that have the potential to significantly affect the environment, whether a landscape-level planning activity triggers a different NEPA review is not clear. For example, because a regional planning review may not, in itself, lead to a federal decision, NEPA may not be required. Even if the planning activity were viewed as a decision document, preparation of an "environmental assessment" may be enough to provide NEPA coverage for the planning activity insofar as the planning exercise itself will not significantly affect the environment (arguably, only later permitting decisions for individual projects will do so).[162]

Section 102 (2) (C) of NEPA directs agencies to "include in every recommendation or report on . . . . major *Federal actions significantly* affecting the quality of human environment, a detailed statement" describing the environmental effects of the proposed action and alternatives to it.[163] CEQ defines "major federal actions" to include "actions with effects that may be major and which are potentially subject to Federal control and responsibility."[164] "Federal actions" which may trigger a NEPA review include agency approval of specific projects by permit, regulatory decision, financial assistance as well as adoption of new or revised agency regulations, plans, programs, or policies.[165] "[F]ederal actions have been interpreted to include a wide range of activities: such as approval of specific projects (e.g., construction of a road in a national park), approval of

[162] In a somewhat analogous circumstance, DOI's Bureau of Ocean Energy Management determined that when evaluating what offshore blocks it would offer to lease for potential offshore wind development in the Atlantic Ocean, based on an analysis of potential conflict areas and other environmental and logistical considerations, it concluded that the planning exercise and the related lease sales only required the preparation of an environmental assessment, rather than an EIS, because the granting the lease itself would not significantly affect the environment. It would be the submittal of a specific project proposal under the lease that would trigger full NEPA review.
[163] 42 U.S.C. § 4332(2)(C) (2010) (emphasis added).
[164] 40 C.F.R. § 1508.18 (2011).
[165] *Id.*

rules, regulations, and other official policies (e.g., adoption of a new set of regulations for concessionaires in national parks), adoption of formal plans or programs to guide agency decisions (e.g., a plan to permit local rangers greater discretion over their parks), and permitting or funding of private projects (e.g., approval of a river crossing for a power line)."[166] CEQ defines "significantly" by looking at "context" and "intensity" of environmental impacts.[167] To be specific, the term "effects" involves direct, indirect, and cumulative effects and 10 detailed factors that should be considered in evaluating intensity.[168]

In this context, *Kleppe v. Sierra Club*, a leading case on whether agency consideration of a project or program is included in the concept of a "proposal" in the CEQ regulations,[169] also provides grounds and logic regarding this issue (whether a landscape-level planning activity triggers a different NEPA review).

Kleppe v. Sierra Club is instructive on this issue. *Kleppe* dealt with coal development policy on federal lands in the Northern Great Plains area. While there was an ongoing plan to lease major areas in the Northern Great Plains region to coal mining interests during the Ford Administration in the 1970s, there was no official plan or announcement. In this context, the Department of Interior (DOI) prepared EISs for its national coal leasing program and for individual leases. However, DOI had not prepared an EIS that focused on coal development within the region as a whole. The Sierra Club sued to force DOI to conduct a regional EIS, insisting that the national EIS was too general and the project-specific EISs were too narrow to assess regional impacts. DOI objected, arguing that "there were many levels of decision making at which one could reasonably prepare an EIS, and it was unreasonable to demand an EIS at every level."[170] The Supreme Court held that DOI was not required to prepare a regional EIS, stating that an EIS is required only where there is an actual report or recommendation on a proposal for major federal action, however there was no proposal for regional coal development. And the court emphasized that mere "contemplation" of an action is not sufficient to trigger an EIS and an EIS is not necessary until an actual proposal has been made.

Alternatively, because a regional planning review may provide the basis for both siting and mitigation decisions, the more directive or specific the planning exercise becomes, it arguably may be advisable to follow NEPA when undertaking such planning activities, perhaps via a programmatic EIS. Preparation of programmatic EIS's that evaluate regional/landscape-level issues also may reduce the scope of project-specific NEPA reviews by enabling subsequent environmental reviews to "tier" off of the analysis included in a programmatic EIS.[171]

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[166] JAMES SALZMAN AND BARTON H. THOMPSON, JR., ENVIRONMENTAL LAW AND POLICY 325 (2010).
[167] 40 C.F.R. § 1508.27 (2011).
[168] *Id.*
[169] *Kleppe v. Sierra Club*, 427 U.S. 390 (1976).
[170] SALZMAN AND Thompson, *supra* note 166, at 329.
[171] A programmatic EIS is designed to analyze and identify the environmental impacts on a regional basis as a whole so that an agency needs to continue its analysis of a specific project

Additional NEPA Considerations

Because compliance with NEPA often is perceived as elongating the infrastructure permitting process, it is useful to consider other aspects of NEPA compliance in the context of regional mitigation planning and individual project reviews.

For purposes of dealing with mitigation issues arising out of project approvals, advanced planning should enable permitting reviews to go more quickly because mitigation issues will no longer be dealt with on the back end of individual project reviews, where late consideration of mitigation requirements may require supplemental environmental analysis, causing delays in decision-making. Instead, mitigation decisions can be made earlier in process, utilizing an already-established regional mitigation framework.

Although it is not a primary focus of these comments, we also note that NEPA reviews for infrastructure projects can proceed in a more timely and efficient basis when permitting agencies engage at an early stage with project proponents and major stakeholders, obtaining early input that anticipates and takes into account potential points of contention before the NEPA process gets officially underway. This has been a key to the successful completion of NEPA work on major renewable energy projects in the first term of the Obama Administration.

Ironically, some of CEQ's regulations seem to suggest that the NEPA process should begin at a very early stage, before projects have been well defined. By way of example, CEQ has stated that "an EIS must be considered before the agencies decide on an action, early enough that it can meaningfully contribute to the decision making process."[172] Elsewhere, CEQ regulations emphasize preparation of an EIS "as close as possible to the time the agency is *developing* or is presenting with *a proposal* so that it can be completed in time for the final statement to be included in any report or recommendation on the proposal."[173] These general statements that NEPA should begin early in the formulation of a project potentially can lead to a more inefficiently and elongated NEPA process. A worst case situation arises when NEPA work has begun before there has been an early, effective scoping of project impacts and a revision of project design to accommodate potentially-fatal flaws that are identified at the initial stage of project reviews. It arguably is better to promote early consultation with all interested parties, and to provide

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through the "tiering" process. Tiering is "the procedure by which an agency that has prepared a broad programmatic EIS can subsequently develop a narrower analysis (project-specific EIS) of an action that is included within the broader program." 40 C.F.R.§1508.28 (2011). Accordingly, a "programmatic EIS can facilitate successive project-specific EISs, specifically, and the subsequent EISs only need to summarize the issues already analyzed in the programmatic EIS, and may concentrate on the issues specific to the subsequent action." Given this function of a programmatic EIS, agencies have to more rigorously conduct a programmatic EIS so as to provide robust documents. In this context, the BLM's "Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States" might be a good example. *See* JOHN F. SHEPHERD, HADASSAH M. REIMER, ET AL., THE NEPA LITIGATION GUIDE 95 (2012).

[172] James Salzman and Barton H. Thompson, *ibid*, 328.

[173] Environmental Impact Statements, 40 C.F.R. § 1502.5 (2011) (emphasis added).

an opportunity for a project proponent to recraft its project design to take into account – and therefore avoid – environmental issues that otherwise may require the project proponent to later reconfigure the project and potentially prepare a supplemental EIS covering the revised project.

V. ESTABLISHING NEW MECHANISMS TO MATCH COMPENSATORY MITIGATION OBLIGATIONS WITH REGIONAL LANDSCAPE SCALE NEEDS AND OPPORTUNITIES

By taking the steps identified above – undertaking planning exercises that identify important regional landscapes by applying broad criteria of environmental health – the stage will be set for a more efficient permitting process that matches compensatory mitigation obligations with regional landscape scale needs and opportunities.

The key to completing the mitigation-related permitting and review processes more efficiently and effectively, however, depend upon three final factors:

(1) When matching up compensatory mitigation obligations with regional landscape scale needs and opportunities, project-related unavoidable environmental harms should be matched up with landscape-scale needs on a "equivalence" basis that focuses on relative degrees of environmental impacts and landscape scale benefits;
(2) Private conservation banks and other reliable third parties should be encouraged to facilitate productive investments in landscape-scale environmental benefits; and
(3) Landscapes that receive compensatory mitigation investments must be monitored and expected improvements must be confirmed.

After addressing these key issues, these comments close with a final subsection which addresses the potential to utilize landscape scale evaluations to identify voluntary, early action opportunities for private parties to undertake conservation actions that could provide them with banked credits for use in addressing future infrastructure siting needs. The current attention being devoted to landscape level habitat needs for sage grouse provides a timely case example of such a potential voluntary program.

A. Using an "Equivalence" Basis to Match Relative Degrees of Environmental Impacts with Landscape Scale Benefits

As discussed above, there is strong interest in unifying and reforming the approach that various agencies take in identifying and requiring compensatory mitigation for unavoidable infrastructure project impacts. The reform concept is based on the proposition that the current approach for identifying mitigation is inefficient and relatively ineffective because it tends to be agency-centric, focusing narrowly on issues identified on an agency-by-agency basis – as opposed to more general environmental harms and benefits. In addition, the agency-centric nature of the exercise typically leads to one-off projects that address one type of environmental harm (such as wetlands or species-related harms), rather than investing in projects that have more broad-based environmental benefits on a landscape. In order to break this agency-centric, one-off

project approach to mitigation, the discussion above has focused on a multi-agency process that involves the development of broad based criteria for environmental health, followed by the identification of landscapes that are particularly important to invest in because of their environmental importance.

In order to make this new approach "go" from a permitting perspective, the same general philosophy – which resists an agency-centric, one-off project approach in favor of a multi-agency process that invests compensatory mitigation dollars in high-return, environmentally well-rounded projects on important landscapes – needs to be incorporated into the infrastructure permitting process. This will require permitting and reviewing agencies to view environmental harms through a broader lens that focuses on the relative seriousness of the environmental degradation caused by the project – as opposed to minute, project-specific impacts on specific resources. The relative seriousness of the harms should then, in turn, trigger "equivalence"-based investments in environmentally beneficial mitigation opportunities that have been identified through the planning process in nearby, regionally significant landscapes.

Using a broader lens to structure compensatory mitigation obligations around relative environmental harms, and benefits, requires a significant shift from today's laser-like focus on more narrow impacts and on the one-off, narrowly-based mitigation strategies that typically address those specific impacts – such as wetlands (Section 404 of the Clean Water Act) and endangered species (Sections 7 and 10 of the Endangered Species Act) compensatory mitigation commitments. It is certainly appropriate to do so, particularly if the broader-based criteria that replace the agency-centric evaluations bow deeply toward watershed health and species/habitat health, in addition to addressing the types of environmental harms that today get short shrift – such as fragmentation of intact landscapes, and the like. In this way, mitigation would address *all* of a project's true environmental harms, including those identified through the NEPA process and other non-Clean Water Act or non-ESA authorities.[174]

When applying an "equivalence" test of an infrastructure project's unavoidable environmental harm to the environmental benefit associated with a compensatory mitigation investment in a landscape-scale need, it may be appropriate to require a "net benefit" metric (rather than a "no net loss"-type metric) to the equivalency test. As a general matter, a net benefit test should not be difficult to demonstrate, given that the planning exercise will have identified an important landscape-scale opportunity that inherently should generate a significant benefit.

B. Private Conservation Banks and Other Reliable Third Parties Should Be Encouraged to Facilitate Productive Investments in Landscape-scale, Environmentally Beneficial Projects

1. Private Conservation Banks

[174] As noted above, however, there may be some infrastructure projects in which particularly serious wetlands or species impacts may require supplemental mitigation that addresses those unique impacts.

A permitting system that uses private mitigation banks can harness the power of the free market to simplify permitting and encourage successful, advanced offsets of project impacts. These banks could be built on private land in landscapes identified in regional planning and be used alongside mitigation on public lands. Banks would allow infrastructure developers to more efficiently navigate the permitting process by facilitating the purchase of credits to meet the compensatory mitigation conditions of their permits.

A mitigation bank is generally a privately owned and operated parcel of land that is environmentally restored, enhanced, preserved, and/or protected by mitigation bankers. The bankers seek approval from a government agency to sell credits in their bank. Developers buy credits from those banks to offset damage done to the landscape they build on. A permitting agency could require purchase of such credits as one method for compensating for the environmental harm caused by infrastructure projects.

Mitigation banks have been successful in implementing the Clean Water Act's protection of wetlands. Under the approach proposed in these comments, mitigation banking would be expanded to cover broader-based indicia of landscape and watershed health, potentially ushering in a more expansive concept of "conservation banking"[175] that could be utilized to meet compensatory mitigation needs. In addition, conservation banking potentially could provide a mechanism to absorb conservation-related investments from other sources, including philanthropy, state and local environmental bonds, the Land & Water Conservation Fund, etc.

Private conservation banks have several potential advantages when used as a mechanism to implement compensatory mitigation. First, they provide an efficient way for project sponsors to discharge their compensatory mitigation responsibilities. Banks are efficient for developers because they can simple purchase the prescribed number of credits and be done with mitigation. Second, because banks typically focus on keeping large, contiguous tracts of land healthy and intact, they tend to deliver sound environmental results.

Third, environmental rehabilitation and remediation should be less likely to fail at a mitigation bank than when undertaken on-site by a permittee.[176] This is because mitigation banks can be developed in areas where they will have the greatest impact, and credits cannot be sold until the bank is up and running and approved. On-site mitigation,

[175] The USFWS has used the term "conservation banking" to refer to banking practices associated with endangered and threatened species and related habitats. However, the Fish & Wildlife Service's concept of conservation banking is based on guidance that is generally considered outdated and inadequate and, in any event, is nearly as well developed as wetlands banking. These comments propose to appropriate the term "conservation banking" to refer to broader-based conservation criteria that focus on balanced indicia of landscape and watershed health that we propose will be developed by an inter-agency team of technical and policy experts, as discussed above.

[176] *See, e.g.*, Phillip H. Brown and Christopher L. Land, *The Effect of Wetland Mitigation Banking on the Achievement of No-Net Loss*, 20 Environmental Management Vol. 3, pp. 333-45 (1999) (noting "[h]igh rates of failure on small, on-site mitigation projects" as one reason to favor mitigation banking).

on the other hand, is often undertaken by a project sponsor that may have little relevant experience and limited incentive to stay involved after the project has been completed. Mitigation banks are also easier to monitor and protect in the long term than discrete projects such as on-site mitigation or smaller off-site projects.

Recognizing the positive environmental outcomes of mitigation undertaken in advance and by experts, in 2008 the EPA and Army Corp of Engineers issued a new joint rule moving away from their longstanding preference for on-site mitigation.[177] The 2008 rule has a flexible preference for compensation options in the following order: "1) use of credits from a mitigation bank, 2) use of credits from an in-lieu fee program, 3) permittee-responsible compensatory mitigation developed using a watershed approach, 4) on-site/in-kind permittee-responsible mitigation, and 5) off-site/out-of-kind permittee-responsible mitigation."[178]

The potential success of a broader-based, multi-agency "conservation" banking system may turn on the agencies' commitment to use such banks when identifying permit-related compensatory mitigation requirements. If banks form where regional planning exercises have identified important indicia of environmental health, agencies should steer permittees toward the use of such banks. It may be prudent for agencies to explicitly state a preference for addressing project-related environmental harms through conservation banks as the EPA and Corps of Engineers did in their 2008 rule.

Implementing a new "conservation" banking program that grows out of regional planning activities and focuses on broader indicia of environmental health—while addressing watershed, species, and habitat health—will require the development of clear rules and expectations. In order to kick-start this effort, we recommend that leading agencies reach out to the private mitigation banking community, along with interested state and tribal officials, NGOs, and other interested parties, and engage in a structured dialogue around several key issues that must be clearly delineated in order to achieve a smoothly operating banking system. Examples of the type of issues that should be included in the dialogue are:

Method for determining credits. A clear, quantitative formula should be developed to determine how many conservation credits an infrastructure developer will be required to purchase to offset impacts. The determination of credits should work hand-in-hand with indicia of landscape health developed by technical and policy experts, and the concepts of "equivalence" and net benefit, as discussed above. It is important that the system be straightforward and easy to administer.

[177] Compensatory Mitigation for Losses of Aquatic Resources; Final Rule, 73 Fed. Reg. 19594 (Apr. 10, 2008); 33 C.F.R. 325; 33 C.F.R. 332; 40 C.F.R. 230.

[178] Environmental Protection Agency, "Compensatory Mitigation Rue: Improving, Restoring, and Protecting the Nation's Wetlands and Stream. Questions and Answers," Mar. 28, 2008, *available at* http://water.epa.gov/lawsregs/guidance/wetlands/upload/2008_03_28_wetlands_Mit_rule_QA.pdf.

Regional Scope. Conservation banking rules will need to identify the allowable proximity between an infrastructure project and the site for compensatory mitigation. Because the bank will key off of landscape-scale opportunities and will therefore be able to leverage more substantial environmental benefits than if the mitigation was occurring in a more isolated area, additional leeway should be given regarding the location of the mitigation bank. Presumably, the bank would be located in the same region and same, or nearby, watershed as the infrastructure project.

Permitting Authority. To be successful, a new conservation banking program will need to be administered by an accountable governmental entity that can write clear rules and oversee its implementation. The question of how to administer the program should be the subject of discussion with the agencies involved and other interested parties. Agencies with on-the-ground permitting and operational experience, such as the Corps of Engineers and the Department of the Interior, should be involved in some meaningful way. One option may be to form a cross-agency conservation banking unit that is jointly staffed with employees from both agencies, supported by permit-related fees. For the sake of efficiency and clarity, there should ultimately be a clear authority for this program.

Durability. Durability of the banks after they are built and credits are sold is one of the keys to the success of a compensatory mitigation banking system for infrastructure projects. Better siting of banks on the front end will help. Some early wetland banks failed because they were built on upland areas that were ill suited for wetlands.

There are several important steps to ensuring durability that can be illustrated by what is required of wetland banks. First, bankers need approval from the Army Corps of Engineers and, if relevant, state authorities before selling credits.[179] Second, the land must be protected by a conservation agency or organization or a conservation easement. And third, adequate financial assurances must be established. These can include an environmental performance bond, escrow account, or other endowment. Generally, the assurances must guarantee five-years of post-construction monitoring and long term management of the site.[180]

Finality/Liability. A key element in the success of mitigation banks is the certainty and finality that they provide to project developers. The assumption is that project sponsors can purchase credits early in the permitting process and have confidence that their mitigation responsibilities have been discharged. In order for this system to work, of course, mitigation banks must provide assurances that they will implement the contracted-for mitigation services, and that mitigation measures will be, and remain,

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[179] *See* Larry Devroy, et al., Oregon Department of State Lands, *Wetland Mitigation Banking Guidebook for Oregon* (2000), <http://www.oregon.gov/dsl/permits/docs/mitbank_guidebk.pdf>. This is a helpful guide to the federal requirements for wetland banks as well as additional state requirements in Oregon.

[180] *US Wetland Banking Market Features and Rules*, ECOSYTEM MARKETPLACE http://www.ecosystemmarketplace.com/pages/dynamic/web.page.php?section=biodiversity_market&page_name=uswet_market.

durable. This is another set of issues that should be the subject of robust discussions, and which needs to be clearly spelled out in banking rules.

Credit Stacking. If a unified concept of environmental health is agreed upon and used as the basis for defining a "conservation bank" credit, credit "stacking" may not be an issue insofar as conservation credits would not be subdivided into various environmental media such as wetlands, habitat protection, or the like. It would be important, however, to confirm that a conservation bank would not be expected to "unbundle" conservation bank credits into submits that could then be amenable to "horizontal or spatial" credit stacking.[181]

2. In-Lieu Mitigation Option

Conservation banks can sometimes take several years to develop. In the meantime, and as a general alternative, in-lieu fee programs (ILFs) can provide a useful mechanism to implement compensatory mitigation obligations. An ILF program is a compensatory mitigation scheme under which the project proponent pays a fee to an approved third party in-lieu of taking on the responsibility itself to conduct the mitigation, or other potential options. For example, a developer filling 10 acres of wetlands in an area with no wetland bank might pay might pay a local conservation agency $50,000 as a condition of getting a permit. The conservation agency would use that money to restore and protect wetlands in the watershed.

ILFs are flexible; they can operate anywhere and take on a wide variety of projects. The major drawback of ILFs is that they do not undertake mitigation until after they have been paid, whereas mitigation bank credits must be developed in advance. Additionally, because ILFs are approved on a more ad hoc basis, they do not always have the same financial and performance assurances as mitigation banks.

Designing a Conservation Banking Market

In creating a market for conservation banking the steering committee should consider:

- *Method for Determining Credits*- a clear, largely quantitative formula for determining how many credits a bank may sell and a permittee must purchase
- *Regional Scope*- the size of the region in which a bank can sell its credits
- *Durability*- how to ensure long-term environmental quality
- *Finality/ Liability*- how to absolve permittees of mitigation liability and shift that liability to bankers
- *Credit Stacking*- can multiple credits be sold on the same land?
- *Permitting Authority*- who will oversee these matters in practice?
- *In-Lieu Fee Mitigation*- a system wherein agencies or approved non-profits can mitigate on behalf of permittees where conservation bank credits are unavailable.

[181] Adam H. Lentz et al., *Water Quality Trading with Lumpy Investments, Credit Stacking, and Ancillary Benefits*, Journal of the American Water Resources Association (JAWRA) 1-18 (2013).

3. Other Reliable Third Parties – Public Lands

In addition to private banks, and the use of in-lieu payment options, other third parties can step in and accept responsibility to implement an infrastructure sponsor's compensatory mitigation obligations. Indeed, where mitigation is targeted on public lands within a checker boarded landscape, the operational purview of private banks and other private players may be limited.

For public lands, the agencies that are themselves issuing permits can, under some circumstances, accept mitigation dollars and the responsibility to apply them toward mitigation projects. By way of example, the BLM has the authority to accept mitigation dollars directly from permittees.[182]

Another option is to utilize quasi-governmental entities that have the authority to accept funds and the responsibility to oversee the implementation of mitigation activities. Such organizations include the Fish & Wildlife Foundation ("NFWF"), National Forest Foundation ("NFF") and National Parks Foundation ("NPF"). These entities may have more hands-on mitigation experience, richer data at their disposal, and more available resources to accomplish mitigation goals when compared to permitting agencies. Furthermore, these entities have the requisite legitimacy – their creation being the result of Congressional action -- and their actions are bound by statutory accountability controls.

This approach reduces transaction costs in a general sense. These support organizations have greater tools at their disposal and are more experienced undertaking actual mitigation measures and deciding where such funds are most effectively spent. Arguably, increased efficiency in the usage of mitigation monies could translate to a lower monetary contribution by permittees. Furthermore, accountability and lower mitigation costs to permittees increases the incentive of project sponsors to simply make a mitigation compensation payment rather than attempt to undertake mitigation efforts on their own. As noted above, mitigation efforts undertaken by developers have had a mixed record of success. Sending mitigation payments to a support entity, rather than undertaking mitigation on piecemeal basis, allows the administrative entity (e.g. NFWF) to not only have greater funds at its disposal but also to exercise flexibility in how those funds are applied to larger endangered landscapes.

4. Third Party Accountability

Project sponsors who are required to provide mitigation payments, and the agencies that approved them, have a vested interest in ensuring that such investments are effective. In Entities receiving such funds need to be held accountable for their conduct with regards to the administration and spending of mitigation dollars. NFWF is particularly attractive

[182] *See* BUREAU OF LAND MANAGEMENT, Regional Mitigation Section Manual Draft MS-1794 § 1.6 (19). Note that § 1.6 (19) defines a "mitigation fund" as "a natural resource management agency, foundation, or other appropriate organization for the performance of mitigation that addresses the impacts of the land-use authorization."

from an accountability standpoint, not only because of its respected reputation[183] and rigorous reporting procedures but also because of its statutory obligations under the Federal Funding Accountability and Transparency Act (PL-109-282).[184] There is significantly less accountability when asking individual developers or the permitting agency itself to provide strong oversight of the process.

Accountability, including monitoring and the reporting of performance data are inextricably linked, and in transferring receipt of mitigation payments to entities like NFWF for administration and implementation, the permitting agency is also able to have more confidence that required monitoring and reporting of the success of mitigation efforts will be undertaken. More importantly, permitting agencies are able to benefit from the existing evaluation programs and frameworks in place at these entities,[185] which in turn will foster trust and increased involvement among stakeholders in the future since they are finally being consistently provided with data that accounts for the impact of their mitigation payments in a transparent and regular fashion.

Furthermore, permitting agencies that are transferring receipt of these mitigation payments to entities like the NFWF[186] have the ability to include conditions that could bind the receiving NFWF-type organization to comply with certain conditions in its use of the funds.[187] This ability should be taken advantage of, particularly in the domain of performance reporting requirements. For instance, permitting agencies demanding that

[183] NFWF was recently entrusted with overseeing Gulf Coast restoration with funds from B.P.'s two billion dollar criminal settlement.

[184] This statute demands that the NFWF publicly report on grants of $25,000 or more in federal funds and include specific pieces of information. However, funds paid directly from developers to NFWF would not necessarily trigger this binding obligation because they are not "federal funds."

[185] NFWF's reporting structure is particularly thorough.

[186] The permitting agency could also use this same methodology to influence less experienced (in this domain) entities like the NFF and NPF to adopt and implement certain accountability measures or reporting requirements that it currently does not have in place. Furthermore, the permitting agency could also seek to have the NFWF, NFF and NPF all harmonize their reporting practices to further streamline the process and increase stakeholder satisfaction and accessibility to data even further.

[187] Permitting agencies can influence the conduct of these entities by either (1) placing conditions in the permit itself, or (2) having the NFWF-type organization agree to certain "blanket" contractual terms (in advance) that will govern the entity's general use of all mitigation funds directed their way by the permitting agency. Since it is likely that NFWF-type entities will be reticent to accept individual mitigation dollars should the permit include some form of responsibility back to the permitting agency and difficulties surrounding the enforcement of such permit-included conditions, the creation of an overarching contractual scheme where NFWF-type entities that wish to be considered by permitting agencies to receive these mitigation dollars agree to stipulated terms in advance is preferable. For instance, interested entities would have to apply and agree to be bound by certain contractual monitoring and reporting requirements that would bind the entity's conduct regarding all future mitigation dollars directed their way by the permitting agency – this type of foundational agreement ensures uniformity, makes it worthwhile for entities to agree and comply, and creates the requisite privity in order to ensure enforcement.

permittees make mitigation payments to NFWF-type organizations could include language rendering receipt of the mitigation funds contingent on the adoption of increased or more stringent reporting requirements. Permitting agencies should leverage the value of the significant monetary contributions it is directing to these government-related entities to achieve a meaningful reporting norm in the domain of mitigation that stakeholders can readily consult and confide in. By attaching strings to mitigation funds, permitting agencies have the ability to shape the overall structure of certain elements of the mitigation process, like data collection and reporting, as well as harmonize the methodologies employed by varying support organizations (i.e. NFWF, NFF, and NPF) to achieve some level of reporting/data homogeneity.

5. Durability and Public Lands

Although regional planning exercises are likely to confirm that some public lands have significant environmental values that could be strengthened by compensatory mitigation investments, questions about the "durability" of mitigation investments on public lands potentially could hold back making such prudent and otherwise-justifiable investments. At issue is whether the public landlord could later "undo" a mitigation investment that is made on public lands. This is not an issue that arises – at least in similar degree – on private lands.[188]

We recommend that the Administration initiate a public dialogue on this question because of its importance. For some projects that are predicted to have a transitory, non-permanent negative impact on the environment, there may be less concern about the longevity of the effectiveness of mitigation expenditures on public lands. For permanent or extended impacts, however, the question is how to ensure that mitigation investments on public lands will match those periods.

It appears that there may be several strategies for dealing with these issues, ranging from requesting Congressional set-asides for key mitigation public lands strongholds[189], potentially hard-wiring mitigation areas (similar to BLM's categorization of "Areas of Critical Environmental Concern") into formal, publicly-reviewed Resource Management Plans, and stipulating that lessees seeking future access to lands upon which mitigation activities have been undertaken must make comparable mitigation investments as a condition of obtaining access to such lands. Also, because FLPMA notes that right-of-way grants can "include an easement, lease, permit, or license to occupy, use, or traverse public lands granted for the purposes" listed in Title V of the Act, and given that

[188] Ensuring appropriate durability on private lands is not particularly troublesome as conservation easements are now well recognized as a reasonably permanent protection mechanism. In dealing with mitigation measures undertaken on private land, the possibility of purchasing the land and placing it in a land trust offers another durable alternative. Conservation banks on private lands also tend to have similar durability mechanisms in place.

[189] Through its history, Congress has identified and designated specific landscapes for protected purposes. Thus, seeking Congressional action would not a logical solution to this issue, particularly given the planning process that will have identified the environmental significance of the landscape and the fact that private funds have been invested in the lands.

compensatory mitigation falls within the purposes of FLPMA, as discussed above, it may be possible to secure mitigation lands through the right-of-way process. *See* 43 U.S.C. 1702(f).

C. Landscapes That Receive Compensatory Mitigation Investments Must Be Monitored And Expected Improvements Must Be Confirmed

In line with the common adage that 'you can't manage what you can't measure,' well-functioning monitoring programs are critical to any effective, adaptive conservation planning effort.

This section provides an overview of current research on effective habitat monitoring programs, followed by an overview of how monitoring programs for wetland banking has operated, in hopes of informing the development of an effective monitoring system for landscape-level conservation/mitigation programs on public lands. Similar to other sections in these comments, we recommend that the Administration initiate a dialogue with key stakeholders to discuss how to strengthen the monitoring of compensatory mitigation projects. Monitoring programs currently are a weak link in the mitigation world.

1. Existing Mitigation Projects Have Weak Administrative & Ecological Performance Records

While mitigation banking holds promise as a tool to avoid net-ecological losses, several studies indicate that it frequently has fallen short of that promise to date. Studies dating as far back as 2001 have shown that while many wetland mitigation projects are not compliant with their permit conditions, wetland mitigation projects have an even spottier record in achieving ecological effectiveness, i.e. in supporting a compensatory wetland that replaces lost aquatic resources. Researchers have shown that not only have compensatory wetlands frequently failed to meet regulated acreage requirements, in most studied cases, only the minority of sites met ecological equivalency tests to compensate for functions in lost wetlands.[190]

In addition, studied cases demonstrate that regulatory performance does not necessarily correlate to ecological performance. Finally, even when monitoring is required, in 2005, the Government Accountability Office found that 30% of wetland mitigation projects failed to submit annual reports; and the Corps' inspection program has been spotty, covering between 13-78% of mitigation banks.

In addition, although wetland mitigation programs have existed the 1980s and have been the subject of both much regulatory and scholarly analysis, limited research exists on the

[190] Rebecca L. Kihslinger, *Success of Wetland Mitigation Projects*, 30 National Wetlands Newsletter vol 2, p. 14 (2008), http://www.tetonwyo.org/compplan/LDRUpdate/RuralAreas/Additional%20Resources/Kihslinger%202008.pdf; Florida Department of Environmental Protection, *An evaluation of the effectiveness of mitigation banking in Florida: ecological success and compliance with permit criteria* (2007) http://www.dep.state.fl.us/water/wetlands/docs/mitigation/Final_Report.pdf.

effectiveness of conservation banking programs.[191] This seems to suggest that conservation management could benefit from dedicated funding for effectiveness evaluations, so as to allow for adaptive actions.

A 100% success rate for landscape level conservation initiatives may not be necessary to yield higher ecological outcomes than the current, piece-meal permitting and mitigation process. However, the limited record of administrative and ecological effectiveness suggest that monitoring should be made an easier and more integral part of project development and execution.[192] It also suggests that more regular monitoring and feedback– supported by dedicated budgets– could help facilitate adaptive management practices and possibly generate better ecological outcomes at lower costs.

To improve monitoring in ways that enhance ecological effectiveness, new programs should consider how to integrate and implement at least the following: (1) clear, science-based criteria for assessing habitat/ecological performance; (2) administrative and ecological performance benchmarks, i.e. require the verification of ecological performance before (re-) authorizing permits; (3) monitoring protocols to identify opportunities for more cost-effective, integrated oversight of ecological performance; and (4) techniques to ensure the availability of dedicated funding to support on-going monitoring. A possible first step in addressing these issues could include hosting a stakeholder workshop to identify state-of-the-art and experientially-based approaches for each of these items.

2. Effective Restoration May Require More Time Than Current Monitoring Practices

The typical monitoring duration for wetland mitigation hovers around five years.[193] However, many restoration experts consider a scale of 5-10 years to be relatively rapid for ecological restoration,[194] and many restoration projects will require even more time – if they can ever be restored at all. Accordingly, we recommend that a dialogue group explore ways to cost-effectively lengthen the duration of monitoring programs, so that they better match expected restoration timelines.

3. Wetland Mitigation Bank Monitoring Requirements May Be A Useful Starting Point for new or modified monitoring programs

[191] The smaller numbers of conservation banks, and related shorter histories may explain part of this difference.
[192] Mark M. Brinson & S. Diane Eckles, *U.S. Department of Agriculture conservation program and practice effects on wetland ecosystem services: a synthesis*, Ecological Applications 21:S116–S127 (2011) http://dx.doi.org/10.1890/09-0627.1.
[193] Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, 60 Fed. Reg. 58605-58614 (Nov. 28, 1995).
[194] Food and Agriculture Organization of the United Nations, Fisheries and Aquaculture Department, *Habitat rehabilitation for inland fisheries Global review of effectiveness and guidance for rehabilitation of freshwater ecosystems*, § 2, *available at* http://www.fao.org/docrep/008/a0039e/a0039e05.htm.

Wetland mitigation bank development includes a few monitoring requirements that can be useful starting points for developing conservation monitoring program. Relevant, stylized highlights from the mitigation bank lifecycle are featured below.[195]

During a bank's establishment:

- The Corps of Engineers and the bank funders negotiate the schedule for releasing permits, according to specified performance metrics. This goes into the "instrument."
- Interagency review teams (usually with the U.S. Corps, US EPA, among others – called the Mitigation Bank Review Team) provide technical reviews of mitigation bank proposals/instruments.
- Adaptive management may be recommended in case of non-performance.

After a bank's establishment, banks must report to the Corps on the performance of the bank annually – though unclear the extent to which this results in adaptation, and the Corps' districts conduct site visits to monitor bank performance.

In practice, monitoring does not always occur; and some evidence exists that the Corps monitors on-site, piece-meal mitigation projects less frequently than mitigation banks.

Three particular recommendations that may prove valuable to adjusting monitoring programs for landscape-level conservation initiatives include: (1) Assess how a mitigation portfolio that includes more large-scale conservation projects could facilitate easier, more regular monitoring - without neglecting small parcels required for some species' survival; (2) Assess opportunities to more easily monitor smaller projects in the conservation mitigation portfolio; and (3) Consider an interagency team to evaluate the performance agreements of conservation initiatives, akin to the wetland mitigation banking review team.

4. Mitigation Implies Restoration, Although Conservation *Could* Yield More Benefits At Lower Cost

Research has frequently shown the difficulty of restoring lands to their previous functionality over any time duration. In addition, among existing restoration efforts, many come at high costs.

These points seem to run at odds with the Corps of Engineers' required ratios for compensatory mitigation types, which require lower acreage compensation ratios for stream and wetland restoration, enhancement, and creation, than for preservation (on an order of 2 or 3 to 1 versus 10:1). This preference potentially over-values costly restoration efforts at the expense of identifying and protecting potentially imperiled, intact habitats. For landscape scale initiatives, this seems to suggest that further analysis

[195] Further information on wetland mitigation bank development can be found on the EPA's website here: http://water.epa.gov/lawsregs/guidance/wetlands/mitbankn.cfm.

of a species condition and habitat is appropriate to determine whether preservation can be achieved at lower cost, and with higher environmental outcomes, than restoration.

Consider the costs of purchasing an easement over a currently undeveloped property in an ecologically sensitive area as one way to contribute to habitat contiguity and function. Depending on the particular property in question, this kind of option – essentially considering the location of prime, priority conservation areas prior to permitting various development options – may prove less expensive in meeting ecological objectives than trying to restore the same property later, after it is subdivided and the watershed and wildlife corridors are compromised.

It is not clear that the apparent preference to spend mitigation dollars on active restoration activities, as opposed to spending mitigation dollars on conservation activities (such as purchasing easements to protect environmentally valuable, working landscapes) leads to better environmental outcomes. If established and monitored/managed appropriately, conservation investments could potentially yield more cost-effective results than active restoration activities.

One likely reason for the preference for active restoration over preservation or conservation is an "additionality" concern. Additionality refers to whether or not a particular outcome would have occurred absent an intervention, i.e. whether it is "additional" above the baseline level of activity. A conservation project would not be "additional" if it leads to an outcome that is legally required or otherwise part of a business-as-usual scenario for reasons like economics, remoteness, opportunity costs, and others.[196] Land managers seeking to create lasting, additional environmental benefits can prioritize protection in areas at high risk of damage from known or potential threats, and in doing so, will more likely deliver real conservation value than projects not facing such threats. [197]

A team of scientists lead by Professor David Naugle at the University of Montana have developed an accounting approach for measuring a mitigation project's value that may prove a helpful starting point for future mitigation and/or offset programs. The key metrics that their approach considers - additionality, probability of success, and time lag to conservation maturity – can help form the foundation for new mitigation offset ratios that could more likely deliver real conservation benefits over current approaches. [198]

Because of the importance of this issue, we recommend that the relative merits of investing compensatory mitigation dollars in active restoration activities, as opposed to conservation activities, be the subject of a structured dialogue. In particular, should

[196] EPA uses the phrase "supplemental to plans or programs already in place" as a way of discussing additionality within the context of wetland mitigation banking. *See supra*, note 193.
[197] Keith Greer & Marina Som, *Environmental Reviews And Case Studies: Breaking the Environmental Gridlock: Advance Mitigation Programs for Ecological Impact*,. 12:03 ENVIRONMENTAL PRACTICE 227-36 (2010).
[198] DAVID NAUGLE ET AL. ENERGY DEVELOPMENT AND WILDLIFE CONSERVATION IN NORTH AMERICA: MAKING MITIGATION WORK FOR CONSERVATION AND DEVELOPMENT (2011).

government officials explore opportunities to preserve critical yet imperiled habitats before incentivizing functionally equivalent restoration? Also, what metrics might be used to ensure that all mitigation projects – whether conservation or restoration – can demonstrate "additional" benefits beyond business-as-usual outcomes?

5. Emerging Spatial Analysis Tools May Help Improve Ecological Monitoring & Performance

While rapid, eco-regional assessments may help in identifying areas prime for conservation, on-the-ground ecological assessments may prove difficult or cost-prohibitive to conduct continuously at scale across the U.S. for threatened and endangered species and their habitats. However, when coupled with field data, emerging remote sensing methods may help address the growing ecological assessment need. With high-quality data inputs, remote sensing methods (e.g. Very High Resolution (VHR) satellite imagery, hyperspectral imagery) may help indicate changes in habitat area, habitat degradation, species diversity and distribution, and pressure/threat trends.

Some U.S. government programs already use remote sensing methods (e.g. the USGS, the National Park Service, and U.S. Fish and Wildlife Service each have programs to monitor invasive species populations and wildlife movements;[199] a joint university, Department of Defense and U.S. EPA effort uses remote sensing for determining chemical composition of the Chesapeake Bay[200]) to manage the health of their jurisdiction's resources, though current research indicates remote sensing has underutilized potential to aid conservation monitoring. [201]

In addition, as species distribution and land jurisdictions warrant, coordination among agencies may yield better outcomes for tracking critical ecosystem health. Resources such as the Geospatial Data Platform and the Federal Geographic Data Committee may aid in combining spatial knowledge of species distribution and habitat within specific interest regions. [202]

To tap into underutilized potential of remote sensing in conservation monitoring, it seems worthwhile to explore the role of emerging remote sensing tools to supplement field assessments for more robust species monitoring; *(2)* continue developing capacity to comfortably conduct and consume high-quality spatial analysis across relevant agencies *(3)* facilitate interoperability of relevant ecological datasets across government agencies and researchers, possibly by encouraging use of the Geospatial Data Platform.

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[199] A few examples of how GIS, remote sensing, and GPS have been used in conservation applications – along with some data on selected species populations in South Florida can be seen at FWS: South Florida Ecological Services Field Office, "Geographic Information Systems (GIS)" http://www.fws.gov/verobeach/GIS.html.

[200] Background on the Chesapeake Bay remote sensing effort can be viewed at Chesapeake Bay Remote Sensing Program, http://www.cbrsp.org/index.html.

[201] Paola Mairota et al.,*Using landscape structure to develop quantitative baselines for protected area monitoring*, 33 ECOLOGICAL INDICATORS, 82-95 (2013).

[202] Federal Geographic Data Committee, http://www.fgdc.gov/.

A GIS-based workshop for relevant agencies – possibly hosted by the Federal Geographical Data Committee – may be a helpful starting point for ensuring interoperability.

Summary of monitoring recommendations

- Host a structured dialogue to explore:
  - How to cost-effectively lengthen the duration of monitoring programs so that they better match expected restoration timelines
  - How to develop and implement the following into new or modified monitoring programs:
    1. clear, science-based criteria for assessing habitat/ecological performance
    2. administrative and ecological performance benchmarks, i.e. requiring the verification of ecological performance before (re-) authorizing permits;
    3. monitoring protocols to identify opportunities for more cost-effective, integrated oversight of ecological performance; and
    4. techniques to ensure the availability of dedicated funding to support on-going monitoring.
  - Whether or how to pursue opportunities to preserve critical yet imperiled habitats before incentivizing functionally equivalent restoration
  - Metrics to ensure that mitigation projects – whether conservation or restoration – can demonstrate "additional" benefits beyond business-as-usual outcomes
  - The continuing or expanded role of emerging remote sensing tools to supplement field assessments for more robust species monitoring
- Continue developing capacity to comfortably conduct and consume high-quality spatial analysis across relevant agencies
- Facilitate interoperability of relevant ecological datasets across agencies and researchers, possibly by encouraging use of the Geospatial Data Platform, and/or by having a relevant group (e.g. Federal Geographical Data Committee) host a GIS-based workshop for relevant agencies.

D. The Potential Use Of Landscape Scale Evaluations To Identify Voluntary, Early Action Opportunities For Private Parties To Undertake Conservation Actions That Could Provide Them With Banked Credits For Use In Addressing Future Infrastructure Siting Needs

The focus on landscape scale planning to identify environmentally significant mitigation opportunities to compensate for infrastructure-related environmental harms has potential applicability to *future* infrastructure permitting needs, as well as current permitting processes. Individuals who can anticipate that they are likely to want to install infrastructure on sensitive landscapes, for example, may be interested in making voluntary, anticipatory compensatory mitigation investments if they could receive a banked credit for the investment that they could apply to a later project.

The current interest in landscape scale habitat needs for the greater sage grouse provides a timely context for this type of potential program. The greater sage-grouse is known as

a landscape-scale bird[203] because it needs large expanses of land to provide habitat components for the various stages of its lifecycle.

The prospect of a potential listing of the sage grouse under the Endangered Species Act in 2015 fiscal year has attracted significant interest from the eleven western states that would be affected by a listing, and by companies whose future infrastructure investments could be impacted by a listing, such as oil and gas companies and wind energy companies.

Currently, significant efforts are underway to inventory important habitat for the greater sage grouse on a landscape scale. The eleven affected states, industry interests, and a number of federal agencies (primarily through the Bureau of Land Management, the Fish & Wildlife Service, the Forest Service, and the Natural Resources Conservation Service) are all deeply engaged in the exercise. Relevant state wildlife and resource agencies also are actively engaged in the effort. The exercise is identifying important habitat strongholds for the species, some of which may be insufficiently protected and are vulnerable to being lost.

Although the "conservation" banking program discussed in these comments is designed to facilitate the permitting of new infrastructure projects that are going through the permitting process, there is no reason why the structure could not potentially be employed to enable interested companies to make early investments, which might be credited to future infrastructure projects. If a clear set of rules to incentivize voluntary action were put in place, infrastructure developers may be encouraged to invest in large-scale voluntary action entailing more habitat benefits than a quilted, small parcel approach. Indeed, the identification of important landscape needs and opportunities for the sage grouse, followed by early voluntary investments into protecting, enhancing and/or restoring such habitats, potentially could provide double benefits: providing a stronger record upon which a sage grouse listing decision can be made, and providing companies with some "insurance" that early investments in protecting habitat will give them credits that they can apply to future infrastructure projects.[204]

This paper's suggestion that a "net benefit" test could be used when evaluating infrastructure-related environmental harms against conservation credits may be particularly appropriate for a voluntary investment in credits that might later be applied to future permitting decisions. If, however, before adopting "net benefit" as a new general standard for compensatory mitigation, there is the need to run a test with the new policy standard, voluntary action could be an appropriate field to do so. Indeed, a policy statement concerning voluntary action could represent an opportunity to review the no net loss rationale, by potentially measuring net benefits entailed by voluntary initiatives - - metrics are particularly important here -- and incentivizing such initiatives by making

[203] John A. Crawford et al., *Ecology and management of sage-grouse and sage-grouse habitat*, 57(1) SOCIETY FOR RANGE MANAGEMENT: RANGELAND ECOLOGY & MANAGEMENT, 2-19 (2004).

[204] This paper's proposal that a "net benefit" test be used when evaluating infrastructure-related environmental harms against conservation credits would be particularly appropriate for a voluntary investment in credits that might later be applied to future permitting decisions.

sure that the accrued benefit will be fully taken into account as credits should there be a need for further action.[205]

[205] The surplus created by the net benefit approach for voluntary action could be accounted for as a premium when the offset is done, as a means to make up for the fact that the prevailing rationale for mandatory mitigation is the lower standard of no net loss. Consider, for instance, that certain voluntary measures are undertaken in order to preempt listing of a species under the ESA. By definition, applying the no net loss standard to such an initiative may not be appropriate, since the expected outcome of successful preemptive action implies improvement of the *status quo* situation. Supposing that the voluntary measures have attained an increase in the number of individuals – a net benefit, therefore – but not to the extent necessary to avoid listing, such net benefit could be fully credited if further, mandatory measures are required. A policy statement in that sense would incentivize early, voluntary action rather than encouraging the adoption of a passive, wait-and-see attitude purely to benefit from the current lower (no net loss) standard.

APPENDIX

Table 1: Sample Spatial data used in the WRR opportunity analyses.[206]

Layer	Source	Description	Date
Land Use/Land Cover	Maryland Department of Planning	Land use/land cover designations	2008
National Hydrography Dataset	U.S. Geological Survey and Environmental Protection Agency	Streams and waterbodies	1999
DNR Wetlands	Maryland Department of Natural Resources – Geographic Information Services Division	Maryland wetlands	1993
National Wetlands Inventory	U.S. Fish and Wildlife Service	Nationwide wetlands	2009
Floodplain	FEMA Q3 Digital Flood Plain Data	Floodplain	Various
Soil Type	U.S. Department of Agriculture – Natural Resources Conservation Service	Soil types and characteristics	Unknown
Impervious Surfaces	Maryland	Impervious and pervious surfaces	Unknown
Protected Lands	Maryland Department of Natural Resources - Wildlife and Heritage Division	Federal and state-owned lands	2002

Table 2: Sample Scoring rubric for the eight WRR's opportunity analyses[207]

Factors (Either absolute or relative. Points are listed for relative factors.)	Preserving Wetlands	Restoring Wetlands	Preserving Uplands	Restoring Uplands	Preserving the Riparian Zone	Restoring the Riparian Zone	Preserving Natural Stormwater Infrastructure	Restoring Compromised Stormwater Infrastructure
Wetlands	Required	Prohibited	Prohibited	Prohibited			+1	x0.3
Water			Prohibited	Prohibited		Prohibited	Prohibited	
Protected land	Prohibited		Prohibited		Prohibited		Prohibited	
Developed			Prohibited	Prohibited				
Karst geology								x0.3
Forested	+1	Prohibited	+1	Prohibited	+1	Prohibited		x0.3

[206] Karin R Bencala, *Integrating Priorities and Achieving a Sustainable Watershed Using the Watershed Resources Registry in the Mattawoman Creek Watershed* (Aug. 2011) http://www.potomacriver.org/publicationspdf/ICPRB11-03.pdf.
[207] *Id.* at 10.

Forested (not farmed, urban)							+1	
Forested within 125 feet, 250 feet, or 500 feet of a stream or waterbody							125: +1 250: +2/3 500: +1/3	