Lessons From Areawide, Multiagency Habitat Conservation Plans in California

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Summary

Through the Endangered Species Act's Habitat Conservation Plan (HCP) program and California's Natural Community Conservation Planning program, endangered species conservation in the United States has evolved considerably. In particular, areawide, multiagency HCPs, many of which developed in California, introduced the possibility of a more comprehensive, adaptive, and collaborative approach to conservation. Synthesizing research, interviews, and dialogue sessions, this Article aims to instruct future areawide, multiagency HCP efforts about the potential trade offs of particular design alternatives, particularly in light of emerging challenges such as climate change. It concludes that regulators and applicants must clearly engage stakeholders about the underlying trade offs among plan scale, depth, duration, cost, certainty, and efficacy to better promote effective, multijurisdictional, large-scale, and adaptive conservation planning.

In thinking about the future of habitat conservation planning, it is important to appreciate and assess its legacy. In this Article, we discuss the experience with habitat conservation planning in the United States and explore its future. Our particular focus is on lessons from large-scale, multiagency Habitat Conservation Plans (HCPs) in California. The Article is the product of research and interviews[1] conducted by the University of California, Irvine Law Center for Land, Environment, and Natural Resources (CLEANR), as well as dialogue sessions[2] co-convened by CLEANR and the nonprofit Center for Collaboration in Governance (CCG).[3]

Through the Endangered Species Act's (ESA's)[4] HCP program and California's Natural Community Conservation Planning (NCCP) program, endangered species conservation in the United States has evolved considerably, and

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1. In addition to multiple dialogue participants, CLEANR interviewed and received comments on this Article from the following: Tom Adams, retired attorney for the City of Brisbane and the Committee to Save San Bruno; Chris Beale, Resources Law Group; Kim Delfino, Defenders of Wildlife; David Hayes, Stanford Law School; Jake Li, Defenders of Wildlife; Shannon Lucas, California Department of Fish and Wildlife (CDFW); Milan Mitrovich, Nature Reserve of Orange County; Elizabeth O'Donoghue, The Nature Conservancy; Tom Reid, TRA Environmental Sciences; Ron Rempel, former program administrator of the San Diego Management and Monitoring Program; Holly Sheradin, CDFW; Cassidee Shinn, CDFW; Dan Tarlock, Illinois Institute of Technology, Chicago-Kent College of Law.
2. Dialogue participants included: Trish Adams, U.S. Fish and Wildlife Service (FWS); David Aladjem, Downey Brand; Michael Allen, U.C. Riverside; Lisa Belenky, Center for Biological Diversity; Therese Bradford, U.S. Army Corps of Engineers; Alejandro Camacho, U.C. Irvine; Greg Costello, Wildlands Network; Dan Cox, FWS; Joe Edmiston, Santa Monica Mountain Conservancy; Manley Fuller, Florida Wildlife Federation; Jennifer Garrison, CDFW; Alan Glen, Sedgwick LLP; Armand Gonzales, CDFW; Keith Greer, San Diego Association of Governments (SANDAG); Denny Grossman, Strategic Growth Council; Jordan Henk, Redlands Institute; John Hopkins, California HCP Coalition; Susan Hori, Manatt, Phelps & Phillips, LLP; Randy Jackson, The Planning Center; Brenda Johnson, CDFW; Melissa Kelly, U.C. Irvine; John Kopchik, East Contra Costa Habitat Conservancy; Charles Landry, Western Riverside Regional Conservation Authority; Jaimee Lederman, U.C.L.A.; Lindell Marsh, Center for Collaboration in Governance (CCG); Steven Mayo, San Joaquin Council of Governments; Jeff Opdycke, San Diego Zoo Global; Monica Parisi, CDFW; Kristen Pawling, Southern California Association of Governments; Christy Plumer, The Nature Conservancy; Michael Robinson-Dorn, U.C. Irvine; Ed Sauls, The Sauls Company; Melanie Schlotterbeck, Conservation Clarity; Ken Schreiber, Santa Clara Valley Habitat Plan; Gian-Claudia Sciara, U.C. Davis; Dan Silver, Endangered Habitats League; Sean Skaggs, Ebbin Moser + Skaggs, LLP; James Sulentich, Nature Reserve of Orange County; Elizabeth Taylor, U.C. Irvine; Melissa Thorme, Downey Brand; Greg Vail, Selva Partners; Martin Wachs, U.C.L.A.; Paul Weiland, Nossaman LLP; Douglas Wheeler, Hogan Lovells; Jill Yung, Paul Hastings.
3. The February 2014 dialogue and December 2014 dialogue each culminated in summary documents. CLEANR, The Future of Habitat Conservation Planning (2014) [hereinafter February Dialogue]; CCG & CLEANR, Outcomes of the Finance Structure of Habitat Conservation Planning and Implementation (2014) [hereinafter December Dialogue].
4. 16 U.S.C. §§1531-1544, ELR Stat. ESA §§2-18.

a number of lessons can be gleaned from this development. Some scholars have asserted that HCPs have undermined the ESA by compromising species and habitat conservation for economic gain and efficiency.[5] Others have contended that HCPs have made the ESA workable by avoiding its otherwise inflexible prohibitions and prolonged political and legal conflicts over resource use.[6] Whether deemed a positive or negative development, it is clear that the HCP program has fundamentally changed the ESA and wildlife conservation in the United States.

In particular, areawide, multiagency HCPs, many of which have developed in the state of California, introduced the possibility of a more comprehensive, adaptive, and collaborative approach to conservation. As some of the first attempts at interagency problem solving, areawide multiagency HCPs have served as useful prototypes for exploring the challenges and possibilities of interjurisdictional coordination. Our Article aims to instruct future areawide, multiagency HCP efforts about the potential trade offs of particular design alternatives, particularly in light of emerging challenges such as climate change that are likely to reshape and even fundamentally transform habitat conservation in the United States. Consideration of the experience with these regulatory innovations is especially timely in light of the imminent overhaul by the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) (collectively the Services) of their HCP Handbook, adopted 20 years ago.[7] More broadly, our analysis also should inform the many proliferating governmental arrangements toward landscape conservation, seeking to reconcile development with ecological conservation, manage change and uncertainty, and plan across scales and jurisdictions.

The Article delves into several topics that provide significant lessons for future habitat conservation planning: (1) planning for and managing habitat conservation at the appropriate ***scale***; (2) promoting effective ***interjurisdictional*** habitat conservation; (3) providing adequate and reliable ***funding*** for habitat acquisition and throughout the planning (and implementation) process; and (4) planning and managing for ***change*** and ***uncertainty*** (of particular import in light of the projected effects of ***climate change*** on species migration and habitat loss). In assessing these pioneering arrangements, we consider not only the efficiency of their formation and implementation processes, but also their effectiveness in advancing valuable conservation goals. The Article concludes that regulators and applicants must clearly engage stakeholders about the underlying trade offs among plan scale, depth, duration, cost, certainty, and efficacy to better promote effective, multijurisdictional, large-scale, and adaptive conservation planning.

I. Development of Areawide Multiagency Habitat Conservation Planning

A. *The Endangered Species Act*

The ESA was a watershed statute in its assertion of federal wildlife protections on private lands.[8] It was enacted in 1973 with a broad prohibition on the "take" of any listed endangered species.[9] The ESA identified its primary purposes as the protection of endangered species and the conservation of the ecosystems upon which such species depend.[10] To fulfill these goals, the statute imposes restrictions on human activity that affect species listed as threatened or endangered. Section 7 prohibits any federal action that would "jeopardize the continued existence" of any listed species or destroy or adversely modify[11] its "critical habitat."[12] Section 9 bars the take of any endangered species by any person, public or private.[13] These initially strict prohibitions, however, did not acknowledge that simply preventing further human development "did little to make endangered species and fragile ecosystems recover once in a steep decline."[14]

B. *The 1982 ESA Amendments*

The ESA was amended in 1982 to depart from the strict and broad prohibition on harming any threatened or endangered species. Section 10(a) authorizes the Services to issue incidental take permits (ITPs) that allow protected species or their habitat to be harmed if carried out in conjunction with an approved HCP.[15] To grant an ITP, the Services must, after affording opportunity for public comment, find that:

5. *See, e.g.*, Craig W. Thomas, *Habitat Conservation Planning*, *in* IV Deepening Democracy: Institutional Innovations in Empowered Participatory Governance 144, 163 n.55 (Archon Fung & Erik Olin Wright eds., 2003).
6. *Id.* at 144. *See also* Laura C. Hood, Frayed Safety Nets: Conservation Planning Under the Endangered Species Act vi (1998).
7. U.S. Fish & Wildlife Serv. (FWS) & Nat'l Marine Fisheries Serv. (NMFS), Habitat Conservation Planning Handbook (1996) [hereinafter HCP Handbook]. E-mail from Dan Cox, Habitat Conservation Planning Coordinator, FWS, to author (Jan. 8, 2016, 5:16 PST) (stating FWS expects to release a draft for formal public comment of its proposed new Handbook in February 2016).
8. Holly Doremus, *The Endangered Species Act: Static Law Meets Dynamic World*, 32 Wash. U. J.L. & Pol'y 175 (2010).
9. 16 U.S.C. §1532(19).
10. *Id.* §1531(b).
11. *Id.* §1536(a)(2).
12. *Id.* §1533(b)(2).
13. *Id.* §1538(a)(1).
14. Alejandro E. Camacho, *Can Regulation Evolve? Lessons From a Study in Maladaptive Management*, 55 UCLA L. Rev. 293, 301 (2007).
15. 16 U.S.C. §1539(a).

> (i) the taking will be incidental; (ii) the applicant will, to the maximum extent practicable, minimize and mitigate the impacts of such taking; (iii) the applicant will ensure that adequate funding for the plan will be provided; (iv) the taking will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and (v) the measures ["that the Secretary may require as being necessary or appropriate for purposes of the plan"[16]] will be met.[17]

As evident from such open terms as "practicable," "adequate," "appreciably," and "appropriate"—and as reinforced by the Services' interpretive guidelines[18]—the requisite findings give those parties involved in the formation of the HCP considerable flexibility to shape it.

Section 10(a)'s provisions were modeled after conservation efforts on San Bruno Mountain in California.[19] The San Bruno HCP was a major innovation in the governance of land and natural resources.[20] The process was a departure from the conventional hierarchical and prescriptive model of governance, anticipating greater collaboration among the public agencies and organizations and private-sector interests in both the implementation of their separate mandates and authorities and in the development of policy.[21] The HCP agreement provided an alternative to the prior practice of conditioning permits, instead allowing for flexible contractual practices and provisions to be included in the resulting implementation of governance policies and programs, including assurances regarding mitigation and development.[22] The San Bruno HCP promoted the cross-jurisdictional integration of planning for projects and other actions, foreshadowing the development of regional multispecies HCPs (MSHCPs) that focused on ecosystems, regions, and landscapes. It was a pioneering effort that sought to focus on a system and transcend the many narrow regulatory boundaries with jurisdiction over the area.[23]

C. California's NCCP Program

Even with the 1982 ESA Amendments in place, there were growing concerns that the statute was ineffective in meeting its goals and that listings were taking a toll on the economy.[24] Many were demanding an overhaul of the ESA and some even wanted it repealed. In 1991, with the potential federal listing of the coastal California gnatcatcher and its implications for the rapidly developing coastal sage scrub region of southern California, the state created an extensive habitat conservation planning legislation that paralleled yet expanded on the HCP program.[25] This NCCP program was initiated through the state's NCCP Act of 1991 as a pilot program to test a new approach to conservation in southern California,[26] and was expanded statewide by the NCCP Act of 2003.[27] The program is, as the California Department of Fish and Wildlife (CDFW) stated, "an unprecedented effort" that "takes a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity."[28]

The program currently includes 23 active planning areas covering more than 9.5 million acres.[29] (See the Appendix for a map of these 23 NCCPs as well as other regional California HCPs.) Landowners and local governments voluntarily enroll in the program under an agreement to protect critical habitat areas and monitor the ecosystems within them.[30] NCCPs are designed to conserve natural communities at the ecosystem level by focusing on their long-term stability while accommodating compatible land use.[31]

Under CDFW's interpretation, the conservation standard under the NCCP Act[32] is higher than that required to approve an HCP permit.[33] The NCCP Act requires actions that contribute to the *recovery* of the species,[34] as opposed to the HCP standard, which only requires minimization and mitigation of the impacts of incidental take "to the maximum extent practicable" and that the authorized actions "not appreciably reduce the likelihood of the survival and recovery of the species."[35] Currently the acreage included in NCCP and regional HCP plan areas in California comprises more than 25% of the total land and water area in the state.[36]

D. Evolution of the HCP Program

From the HCP program's inception, there have been differing views of the function and effects of HCPs. To many, the HCP program has been viewed as a "habitat development agreement"—a way for developers to obtain a permit to take species that were in danger of extinction without adequate conservation.[37] Alternatively, many landowners and developers viewed the HCP program as

16. *Id.* §1539(a)(2)(A)(iv).
17. *Id.* §1539(a)(2)(B).
18. The Services' HCP Handbook provides that any mitigation mandated in an HCP must be "commensurate with the impacts," and based on a "sound biological rationale." HCP Handbook, *supra* note 7, at 3-19, 7-3.
19. H.R. Rep. No. 97-835, at 31 (1982) (Conf. Rep.), *reprinted in* 1982 U.S.C.C.A.N. 2860, 2872.
20. Telephone Interview with Tom Adams, Retired Att'y for City of Brisbane & Comm. to Save San Bruno Mountain (Dec. 4, 2014).
21. *Id.*
22. Robert Thornton, *Searching for Consensus and Predictability: Habitat Conservation Planning Under the Endangered Species Act*, 21 Envtl. L. 605, 624-25 (1991).
23. Telephone Interview with Tom Adams, *supra* note 20.
24. Daniel Pollak, Cal. Research Bureau, Natural Community Conservation Planning 5 (2001).
25. *Id.* at 3, 11-12.
26. *Id.* at 32.
27. Natural Community Conservation Planning Act, Cal. Fish & Game Code §§2800-2835 (2014).
28. Cal. Dep't of Fish & Wildlife (CDFW), *Natural Community Conservation Planning (NCCP)*, https://www.wildlife.ca.gov/Conservation/Planning/NCCP (last visited Dec. 21, 2015).
29. *Id.*
30. *Id.*
31. *Id.* Telephone Interview with John Hopkins, Dir., Cal. Habitat Conservation Planning Coal. (Nov. 3, 2014).
32. Cal. Fish & Game Code §2820(b)(9) (2014).
33. Pollak, *supra* note 24, at 33.
34. *Id.*
35. 16 U.S.C. §1539(a)(2)(B)(ii), (iv) (2014).
36. CDFW, *supra* note 28.
37. Graham M. Lyons, *Habitat Conservation Plans: Restoring the Promise of Conservation*, 23 Environs Envtl. L. & Pol'y J. 83, 105 (1999).

a way for environmental interests to block development and thereby "take" their land.[38] Still others saw the HCP program as a way to mediate the growing conflict between wildlife conservation and development, with some sense that it would take the momentum out of growing efforts to defang the ESA.[39]

The legislative history of the ESA's §10(a) amendment makes clear that HCPs were intended to rely on "creative partnerships between the public and private sectors and among governmental agencies" in developing broader, flexible ways for managing species and their relation to their surrounding ecosystems.[40] The HCP program was thus an "earl[y] experiment[ ] . . . [in] transforming administrative law from its traditionally static and inflexible command-and-control regulatory model into a negotiated process that better addresses public goals through both collaborative and adaptive decisionmaking."[41]

The number of HCPs has multiplied over the past three decades. Less than 15% are areawide HCPs,[42] though areawide HCPs make up virtually all the acreage subject to HCPs.[43] Despite the legislative history accompanying the §10(a) amendment references to the multiparty San Bruno HCP, ESA §10(a) does not include any specific provisions that require HCPs or ITPs to be either collaborative or adaptive. As a result, two broad types of HCPs generally have emerged as the program has matured: those more akin to conventional, smaller project-specific permits; and those that are more regional, multipermittee, managing multiple species, and often more collaborative.[44]

In the first decade following the approval of the San Bruno HCP, only 14 HCPs were adopted. However, FWS' development of draft HCP guidelines in 1990 provided significant guidance on possible uses of HCPs, and during the William J. Clinton Administration, approximately 300 HCPs were approved.[45] Many attribute this surge in HCP creation to the Services' adoption of the "No Surprises" policy[46] in 1994 and the assurances for landowners that came with it, as further discussed below in Section V.B.[47] Most of the HCPs were adopted in areas experiencing substantial development pressure and where biodiversity was the most threatened, such as California, Florida, and Texas. In 2000, the Services published a five-point policy as an addendum to its HCP Handbook, with the intent of clarifying existing regulations and the No Surprises policy.[48]

Although the HCP program was given relatively less attention under the George W. Bush Administration, by the end of 2007, approximately 200 additional HCPs had been approved.[49] Nonetheless, there were fewer proposals for larger, more ambitious HCPs.[50] In contrast, while the numbers of HCPs have declined, the Barack Obama Administration has broadened consideration of habitat conservation, including working on efforts to promote conservation in connection with other objectives, such as renewable energy, and to address conservation at a landscape level.[51] As of December 2015, FWS reports the approval of at least 705 total HCPs, with 826 ITPs.[52]

II. Managing the Scale, Scope, and Duration of Planning

Early in development of the HCP program, it was understood that for HCPs to lead to effective habitat conservation, plans needed to expand their scope from a single-species focus to a more comprehensive multispecies focus. At the same time, many actors recognized significant benefits from planning at a broader geographic scale, and over a longer duration. However, expansion of the geographic, ecological, and temporal scales substantially increases the complexity of planning. Particularly given the resource constraints of government authorities, these trends create the risk of HCPs becoming so deep and broad as to make the initial plan formation process very challenging and even more difficult to implement.

For areawide multiagency HCPs, there is a tension between the breadth of multispecies, ecosystem conservation, and the depth required to adequately provide for the habitat needs of all species. Many plans have attempted to find a middle ground between an HCP that is narrow and deep at one extreme and an HCP that is broad and shallow at the other. Despite these efforts, there has been very little review of what has and has not proved successful. After 32 years, areawide multiagency HCPs and their evolution over the past three decades provide valuable lessons for improving HCPs moving forward. The HCP program, with its various successes and limitations, also serves as a model to

38. *See* Craig Anthony Arnold, *Conserving Habitats and Building Habitats: The Emerging Impact of the ESA on Land Use Development*, 10 Stanford Envtl. L.J. 1 (1991).
39. *See* Oliver A. Houck, *On the Law of Biodiversity and Ecosystem Management*, 81 Minn. L. Rev. 869, 959 (1997).
40. H.R. Rep. No. 97-835 (1982) (Conf. Rep.), *reprinted in* 1982 U.S.C.C.A.N. 2860.
41. Camacho, *supra* note 14, at 295.
42. Shira A. Bergstein & April Mo, Univ. of Cal. Transp. Ctr., The Role of Habitat Conservation Plans in Facilitating Transportation Infrastructure 18 (2012).
43. *See* David Callihan et al., Mgmt. Sys. Int'l, An Independent Evaluation of the U.S. Fish & Wildlife Service's Habitat Conservation Plan Program 12-13 (2009).
44. *See id.*
45. David A. Dana, *Reforming Section 10 and the Habitat Conservation Plan Program*, *in* Rebuilding the Ark 32, 34-35 (Jonathan H. Adler ed., 2011).
46. 50 C.F.R. §§17.22(b)(5), 17.32(b)(5), 222.307(g) (2014) (placing the financial burden on the Services and not applicants if unforeseen circumstances during implementation of the HCP require a change in management strategy).
47. *See, e.g.*, Hood, *supra* note 6, at 5.
48. Notice of Availability of a Final Addendum to the Handbook for Habitat Conservation Planning and Incidental Take Permitting Process, 65 Fed. Reg. 35242 (June 1, 2000) [hereinafter HCP Handbook Addendum].
49. Dana, *supra* note 45, at 4.
50. *Id.*
51. *See, e.g.*, U.S. Dep't of the Interior (DOI), Secretarial Order No. 3330, *Improving Mitigation Policies and Practices of the Department of the Interior* (2013), http://www.doi.gov/news/loader.cfm?csModule=security/getfile&pageid=380602.
52. FWS, *Conservation Plans and Agreements Database*, http://ecos.fws.gov/conserv_plans/PlanReportSelect?region=9&type=HCP (last visited Dec. 21, 2015) [hereinafter Database].

be built upon by the more recent landscape-level planning initiatives discussed below.

A. Lessons From Broadening the Scope

1. Advantages of a Multispecies Approach

Many of the HCPs that developed shortly after the enactment of ESA §10(a) were single-species focused,[53] despite the references to the multispecies San Bruno HCP in the legislative history of §10(a). However, this single-species approach was heavily criticized for its neglect of ecosystems that depend on the interactions of a variety of species, not only listed species, and for leading to species' survival in "only very small, fragmented populations."[54]

Increasing urbanization added to the pressure to change the ESA's single-species focus, with developers and agencies eager to create large MSHCPs in an attempt to protect development projects from future listings of additional species.[55] Particularly in southern California, with population tripling between 1950 and 1990, urban sprawl was taking a toll on the coastal California gnatcatcher and its habitat.[56] The NCCP program was created in an attempt to prevent the listing of the gnatcatcher,[57] and was intended to respond to criticisms of the HCP program by adding flexibility and an explicit multispecies focus.[58] In the years that followed, the Orange County Central and Coastal Subregion MSHCP, the San Diego Multiple Species Conservation Program (MSCP), and the Western Riverside MSHCP, among others, were approved, and the idea of MSHCPs was established.

Today, the Services do not require, but strongly endorse, a multispecies approach to HCPs, with the objective of conserving biological communities at the ecosystem scale.[59] A multispecies approach "both increases certainty for the permittee in case of future listings and increases the 'biological value' of the plans by providing for 'ecosystem planning' and early consideration of the needs of unlisted species."[60] Concentrating efforts on the conservation of multiple species necessitates a habitat or ecosystem-based approach, which many claim better facilitates the protection of biodiversity.[61]

The NCCP program is a well-regarded habitat-based approach that groups species according to the habitat communities they require.[62] The NCCP program promotes a focus on overall ecological health and the idea that adequate protection for each species can be gained through protection of each habitat type, as opposed to focusing conservation efforts on preventing future harm to a single constituent species.[63] Thus, the 11 subregional plans that make up the NCCP pilot program's planning area were designed around a type of habitat, coastal sage scrub, instead of around the location of specific incidental take activities or a single species.[64] With this habitat-based focus, the plans could potentially protect a broader range of species that might otherwise be overlooked in a conventional HCP[65] by avoiding habitat fragmentation and allowing for the interactions of a wide variety of plant and animal species, not just those that are listed.[66]

2. Challenges of a Multispecies Approach

While a multispecies approach has its advantages, it also carries risks related to the increased complexity, uncertainties, and costs of managing more species.[67] Adding more species potentially raises the number of components to monitor and manage, and can increase planning and implementation costs.[68] A number of commenters have stated that multispecies plans can be more expensive and time-consuming to prepare and administer than single-species plans.[69] If resources for planning and implementation are not increased, a multispecies approach raises the risks that come from distributing planning resources more thinly.[70] The increased complexity of the multispecies approach places an increased burden on ensuring extensive and accurate scientific data and analyses that serve as the basis for the plan.

The multispecies approach may be worth the additional implementation costs if the plan is more effective at ecological conservation. However, multispecies plans that rely on generalized management of habitat types, rather than species-specific conservation actions, have been criticized in the scientific literature for being less effective than single-species plans.[71] This limited analysis of effectiveness fails to take into account that single-species HCPs do not attempt to manage any other species. Thus, the criticism does not factor in the benefits to the other ecosystem components that a multispecies focus may offer over single-species HCPs.[72]

53. *See* Econ. & Planning Sys., Inc., Economic Effects of Regional Habitat Conservation Plans 1, 2 (2014).
54. *See* Pollak, *supra* note 24, at 8-9.
55. John Buse, *Can a Multi-Species Habitat Conservation Plan Save San Diego's Vernal Pool Species?*, 6 Golden Gate U. Envtl. L.J. 53, 67 (2012).
56. Pollak, *supra* note 24, at 5.
57. Hood, *supra* note 6, at 10.
58. Pollak, *supra* note 24, at 11.
59. HCP Handbook, *supra* note 7, at 1-14 to 1-15.
60. Matthew E. Rahn et al., *Species Coverage in Multispecies Habitat Conservation Plans: Where's the Science?*, 56 BioScience 613, 613-14 (2006).
61. J. Alan Clark & Erik Harvey, *Assessing Multi-Species Recovery Plans Under the Endangered Species Act*, 12 Ecological Applications 655, 655 (2002).
62. Peter Kareiva et al., Using Science in Habitat Conservation Plans 36 (1999).
63. *See id.*
64. Daniel Pollak, Cal. Research Bureau, The Future of Habitat Conservation? 3-4 (2001), http://cdm16254.contentdm.oclc.org/cdm/ref/collection/p178601ccp2/id/2166.
65. HCP Handbook, *supra* note 7, at 3-37.
66. *See* Pollak, *supra* note 24, at 8.
67. Callihan et al., *supra* note 43, at 9, 17-18.
68. *Id.* at 17; *see* Christian Langpap & Joe Kerkvliet, *Endangered Species Conservation on Private Land: Assessing the Effectiveness of Habitat Conservation Plans*, 64 J. Envtl. Econ. & Mgmt. 1, 14 (2012).
69. Telephone Interview with Thomas Reid, Principal, TRA Envtl. Sciences (Dec. 7, 2014).
70. Langpap & Kerkvliet, *supra* note 68, at 14.
71. Rahn et al., *supra* note 60, at 618 (citing P. Dee Boersma et al., *How Good Are Endangered Species Recovery Plans?*, 51 BioScience 643 (2001); and Martin F. J. Taylor et al., *The Effectiveness of the Endangered Species Act: A Quantitative Analysis*, 55 BioScience 360 (2005)).
72. *See* Pollack, *supra* note 24, at 8; Callihan et al., *supra* note 43, at 9, 17-18.

Nonetheless, these studies do demonstrate that there often is a trade off between expanding the number of ecological components managed in an HCP and the costs or effectiveness of plan implementation. Though there may be significant advantages to a multispecies approach, California's experience with areawide multiagency HCPs suggests that those benefits may only be realized if they are accompanied with funding, monitoring, and research commensurate to the plan's increased complexity.

B. Lessons From Widening the Scale

1. Advantages of Larger Scale HCPs

There are no limitations placed on the size of an HCP.[73] The Services' Handbook only recommends that "HCP boundaries should encompass all areas within the applicant's project, land use area, or jurisdiction within which any permit or planned activities likely to result in incidental take are expected to occur," and that "applicants should be encouraged to consider as large and comprehensive a plan area as is feasible and consistent with their land or natural resource use authorities."[74] However, the trend among areawide multiagency HCPs and throughout conservation management has been to broaden the horizon for planning.

Since the enactment of the ESA, and increasingly with the shift toward MSHCPs and their expanded scope, there has been a steadily growing conviction that the conservation of multiple species and ecological resources more generally requires larger-scale approaches[75] that go beyond traditional project-by-project mitigation for impacts resulting from development.[76] Project-by-project mitigation typically takes the form of a "'mitigation hierarchy': avoid, minimize, restore, or offset," but its project-by-project application is limited in flexibility and ultimately can result in underestimating cumulative development impacts, extending permitting time lines, and creating confusion with other agencies' mitigation requirements.[77]

Habitat fragmentation often resulted from or was exacerbated by early HCPs that were single-species, single-project-focused and provided only piecemeal protection.[78] For example, the 1986 Coachella Valley HCP that was created to protect the fringe-toed lizard was criticized for the relatively small portion of native habitat it protected,[79] and its failure to protect the sand source areas and transport corridors.[80] The HCP has also been criticized for excluding other important habitat, including designated critical habitat.[81]

The experience of areawide multiagency HCPs is that larger-scale, ecosystem planning enables participants to avoid a piecemeal approach to conservation, better address cumulative impact concerns, and avoid habitat fragmentation.[82] Larger-scale conservation approaches at the regional or landscape level are arguably better-suited for addressing conservation challenges that inevitably transcend "the legal and geographic reach of existing jurisdictions and institutions."[83]

Assessing mitigation and planning together on a larger scale accounts for cumulative impacts of regional development projects, provides regional context to best determine whether mitigation or offsets can be applied, and allows for an optimal choice of offsets to address threatened ecosystems or species.[84] A larger geographic scale can more accurately factor in landscape connectivity and corridors to facilitate species' movement among preserve areas.[85] Broadening the geographic scale reduces the risk that unoccupied yet vital land will be overlooked. Habitat unoccupied at the time the plan is designed may still need to be included to ensure that it remains in an occupiable state should the species need to colonize the area in the future.[86]

Areawide multiagency HCPs must address conservation issues on a scale large enough to accurately assess trends and relationships within the preserve area. In fact, some contend that larger-scale approaches are "the *only* way to conserve the overwhelming mass—the millions of species—of existing biodiversity."[87] For example, organisms such as invertebrates, fungi, and bacteria perform critical ecosystem functions that may not be readily apparent, and such organisms are likely only to be conserved as the scale is broadened to conserve entire ecosystems.[88] Additionally, although areawide multiagency HCPs may be more complex and costly initially, a broader scale may provide a better opportunity for streamlining later management decisions in the long term.

There is a recent trend toward even larger landscape-level conservation planning both in and out of the HCP program.[89] Landscape-level conservation, generally, comprises combining the mitigation hierarchy typical in the project-by-project approach with conservation planning.[90] It involves multijurisdictional, multipurpose, multistakeholder efforts to address conservation challenges.[91] Outside

73. HCP Handbook, *supra* note 7, at 3-11.
74. *Id.*
75. Jerry Franklin, *Preserving Biodiversity: Species, Ecosystems, or Landscapes?*, 3 Ecological Applications 202 (1993); *see* Matthew McKinney et al., Large Landscape Conservation: A Strategic Framework for Policy and Action 5 (2010), *available at* http://www.lincolninst.edu/pubs/dl/1808_1037_Large Landscape Conservation final.pdf.
76. Joseph Kiesecker et al., *Development by Design: Blending Landscape-Level Planning With the Mitigation Hierarchy*, 8 Frontiers Ecology Env't 261, 261 (2010).
77. *Id.*
78. *See* Hood, *supra* note 6, at 7, 9.
79. Timothy Beatley, *Balancing Urban Development and Endangered Species: The Coachella Valley Habitat Conservation Plan*, 16 Envtl. Mgmt. 1, 12, 16 (1992).
80. Telephone Interview with John Hopkins, *supra* note 31.
81. Beatley, *supra* note 79, at 16.
82. Hood, *supra* note 6, at 9, 11.
83. McKinney et al., *supra* note 75, at 2.
84. Kiesecker et al., *supra* note 76, at 262.
85. Beatley, *supra* note 79, at 16.
86. *Id.* at 14, 16.
87. Franklin, *supra* note 75, at 202.
88. *Id.*
89. *See, e.g.*, McKinney et al., *supra* note 75.
90. Kiesecker et al., *supra* note 76, at 262.
91. *Id.*

the HCP program, the federal government and many state governments have undertaken a variety of measures to promote landscape-scale habitat conservation. Three notable federal initiatives include:

- *FWS' Strategic Habitat Conservation Approach.* FWS endorsed strategic habitat conservation in 2006 as its fundamental conservation approach for the 21st century in response to the unprecedented scale and complexity of challenges facing natural resources. FWS characterizes it as a new landscape-scale scientific method that also seeks to foster collaborative relationships in the conservation delivery process.[92]
- *DOI's Landscape Conservation Cooperatives Network*. In 2009, U.S. Department of the Interior (DOI) Secretarial Order 3289 called on DOI bureaus and agencies to develop a network of 22 collaborative Landscape Conservation Cooperatives, each forming a regional network of land, water, wildlife, and cultural resource managers, scientists, and interested public and private organizations seeking to share scientific information and promote interjurisdictional conservation planning.[93] However, there is at best limited integration of individual HCPs and the HCP program itself into this burgeoning interjurisdictional landscape-level planning effort.
- *DOI's Energy and Climate Change Task Force Strategy*. In 2013, Secretarial Order No. 3330 established the mandate for DOI's Energy and Climate Change Task Force to put landscape-level planning and mitigation measures at the forefront of future large-scale infrastructure development projects.[94] In response, the Task Force issued an April 2014 strategy report[95] containing 10 guiding principles for landscape-level planning.

The proposed Desert Renewable Energy Conservation Plan (DRECP)[96] reflects the magnitude of scale that the landscape-level approach represents. As illustrated in the map in the Appendix, the proposed DRECP's 22.5 million acres would be larger than all of southern California's existing HCPs combined. The proposed Great Plains Wind Energy HCP would seek to address potential impacts of wind energy development on several listed avian species for approximately 268 million acres in the central United States.[97] The vast size is intended to allow for the "identification of the most strategic areas for development and mitigation efforts, instead of a project-by project approach that does not incorporate a strategic view of landscape-level impacts and planning."[98]

2. The Challenges of Breadth

As beneficial as a broad plan can be, according to dialogue participants, the experience of areawide multiagency HCPs is that a larger scale is not without cost. First, the broader the plan is—whether geographically or in terms of resource concern—the more jurisdictional boundaries that are crossed, and the more private, local, state, and federal agencies that have an interest in and/or authority over the outcome. At a minimum, this likely increases the initial cost of plan formation and implementation, and/or likely dilutes the quality of the plan's analysis.

Perhaps more importantly, this increased breadth also amplifies the difficulty of reconciling a broader set of important but often competing resource goals, and thus raises the likelihood that the plan is less effective at achieving its management goals. For example, the Bay Delta Conservation Plan (BDCP) was proposed as a joint HCP/NCCP with the coequal goals of providing a more reliable water supply and protecting, restoring, and enhancing the delta ecosystem.[99] However, the proposed BDCP failed to meet HCP and NCCP conservation standards and was replaced with the California WaterFix, which lacks a habitat conservation plan.[100] The BDCP has been identified as representative of the difficulties in reconciling diverse local and regional interests when plans take on large-scale conservation efforts.[101]

As the scale of planning extends even more broadly, the difficulties of expanding scale and breadth become more evident. The draft DRECP, for example, is attempting to establish an areawide, multiagency, multispecies conservation effort that is unprecedented in scope and scale.[102] Its purpose is to utilize both an NCCP and an HCP to provide for the development of renewable energy projects in coordination with the conservation of habitat for 37 different plant and animal species.[103] Some involved with the initial draft plan's formation have expressed doubt as to whether it will be able to achieve the level of species protection necessary to qualify as an NCCP.[104]

92. FWS, *National Conservation Training Center*, http://training.fws.gov/courses/roadmaps/shc/ (last visited Dec. 30, 2015).
93. DOI, Secretarial Order No. 3289, *Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources* (2009), *available at* http://www.doi.gov/whatwedo/climate/cop15/upload/SecOrder3289.pdf.
94. DOI Secretarial Order No. 3330, *supra* note 51.
95. Joel P. Clement et al., A Strategy for Improving the Mitigation Policies and Practices of the Department of Interior: A Report to the Secretary of Interior From the Energy and Climate Change Task Force (2014), *available at* http://www.doi.gov/news/upload/Mitigation-Report-to-the-Secretary_FINAL_04_08_14.pdf [hereinafter DOI Mitigation Strategy].
96. Desert Renewable Energy Conservation Plan (Proposed), http://www.drecp.org (last visited Dec. 30, 2015).
97. Great Plains Wind Energy Habitat Conservation Plan (Proposed), http://www.greatplainswindhcp.org (last visited Dec. 30, 2015).
98. *Id.*
99. Bay Delta Conservation Plan, http://baydeltaconservationplan.com (last visited Dec. 28, 2015).
100. *Id.*
101. Rachael E. Salcido, *The Success and Continued Challenges of the Yolo Bypass Wildlife Area: A Grassroots Restoration*, 39 Ecology L.Q. 1085, 1128 (2012).
102. Desert Renewable Energy Conservation Plan (Proposed), *Plan Area and Covered Activities*, *supra* note 97.
103. *Id.*
104. Telephone Interview with Kim Delfino, Cal. Program Dir., Defenders of Wildlife (Dec. 10, 2014).

The initial proposed plan alone was a more than 8,000-page document that received considerable backlash due to its unwieldy "size, complexity and heavy use of jargon."[105] The Bureau of Land Management and the California Energy Commission decided to delay "the non-federal portion of the plan after officials received more than 12,000 public comments," in order to address the comments and refine the proposed plan.[106] The renewable energy industry raised concerns about the "'extremely complex' permitting process for development projects" and how it is "in conflict with the idea of streamlining."[107] The DRECP's independent science panel has also criticized the plan, noting that it lumps diverse habitats with distinct ecological characteristics into the same categories and proposes to manage them identically,[108] and that the plan fails to address a number of species of concern that will likely be affected by desert renewable energy development.[109] Thus, though the trend has been to expand the scale and scope of HCPs, that movement is beginning to experience some pushback as plans like the DRECP grapple with the complexity of planning on a landscape level.

To reduce the manageability challenges of broadening scale, some plans have sought to focus the planning analysis and conservation management on a single issue. For example, the Great Plains HCP tackles conservation of endangered and threatened species over an enormous area of land. However, it only addresses a single issue—the impacts from wind energy development. By limiting the landscape-scale planning to a single issue, such landscape-level, areawide, multiagency HCPs are trading plan depth for breadth.

C. Lessons on Duration

In conjunction with trends to expand the scale and scope of species conservation planning and management, areawide multiagency HCPs also have had to consider the additional complexities and uncertainties of extending a permit's duration. The Services' five-point policy provides factors to consider in determining permit duration.[110] However, the Services do not set a maximum permit duration, instead providing that "the allowable duration of a permit is flexible but an expiration date must be specified."[111] As a result, permit durations have ranged anywhere from several months to as long as 100 years.[112] Larger-scale, areawide, multiagency HCPs generally have longer duration permits, on average about 30-50 years.[113] With the trend toward larger-scale HCPs, a greater number of plans are tackling conservation issues over greater time horizons.[114]

1. The Advantages of a Longer Term

Some contend that areawide multiagency HCPs necessitate planning over longer time horizons.[115] Some dialogue participants who have been working on HCP implementation noted the desirability of longer-term permits for larger plans. Participants identified one of the values of landscape-level planning as its emphasis on the management of dynamic ecological systems. A longer time horizon, coupled with planning on a landscape level, allows a prospective analysis of a broad range of habitats with certain species in mind, and an evaluation of the most desirable in the area for those species over time. Such an approach can promote dynamic ecosystem planning, which is critical to areawide multiagency HCPs and their increasing need to adapt to changed circumstances, discussed in Section V.

Longer-duration permits may also be preferable for permittees because of the expense and time consumed in preparing a plan and because these permits may provide greater land use regulatory certainty.[116] Further, some commentators have noted that a longer permit term may be necessary in order to meet the stricter "beyond mitigation" conservation standard of NCCPs because significant time and money are required to put protections in place that enable the recovery of each of the covered species.[117]

2. The Challenges of a Longer Term

On the other hand, longer-duration permits may be less desirable because of the inherent complexity and uncertainty that comes with managing dynamic species and habitats over extensive time horizons and the difficulty of projecting impacts of development many years out. As with moving to deeper, multispecies planning and landscape-scale analysis, lengthening the time horizon raises the costs and uncertainties of the plan's initial analysis and/or the risks that the original planning is flawed and inadequate, particularly in light of the No Surprises policy discussed in detail in Section V.B. A study that assessed the adequacy of scientific analysis at each stage of the HCP process found that shorter-duration permits have better estimates of take that will occur under the HCP.[118] Some assert a shorter time horizon is more appropriate for the DRECP because information gaps are inevitable for such a large plan area,

105. Sammy Roth, *DRECP Strategy Full of Complexities, Some Say,* Desert Sun (Nov. 7, 2014, 11:28 PM), http://www.desertsun.com/story/tech/science/energy/2014/11/08/drecp-strategy-complex-say/18704431/.
106. Scott Streater, *BLM, State to Rework Calif. Desert Solar Plan After Public Criticism*, Energy & Env't Rep., Mar. 10, 2015, http://www.eenews.net/greenwire/2015/03/10/stories/1060014774.
107. *Id.*
108. Initial Recommendations of the DRECP Independent Science Panel (2012), *available at* http://www.drecp.org/documents/docs/Independent_Science_Panel_2012_Initial_Recommendations.pdf.
109. *Id.*
110. HCP Handbook Addendum, *supra* note 48, at 35255-56.
111. HCP Handbook, *supra* note 7, at 6-25.
112. Kareiva et al., *supra* note 62, at 2.
113. Paola Bernazzani et al., *Integrating Climate Change Into Habitat Conservation Plans Under the U.S. Endangered Species Act*, 49 Envtl. Mgmt. 1103, 1104 (2012).
114. *See* Database, *supra* note 52.
115. Bernazzani et al., *supra* note 113, at 1105.
116. Kareiva et al., *supra* note 62, at 33.
117. Telephone Interview with John Hopkins, *supra* note 31.
118. Kareiva et al., *supra* note 62, at 4.

and predicting renewable energy development in the desert more than 25 years out is extremely difficult.[119]

Moreover, if a plan with a longer-duration permit does not incorporate an effective strategy for adjusting conservation measures to integrate new data or ecological changes, the plan may not be able to meet its conservation goals.[120] Thorough up-front scientific analyses and effective adaptive management measures may help address the challenges of lengthening the permit term in the face of uncertainty, addressed in detail in Section V. Nonetheless, a longer permit term places increased pressure to ensure that the initial analysis is scientifically sound and that subsequent implementation measures are sufficiently well-formulated and adaptive to manage the increased likelihood of new information or changed circumstances altering the appropriate management strategies.

D. Reconciling Scope, Scale, and Duration

As illustrated above, a successful areawide multiagency HCP requires an express understanding of the interplay of the tensions among scope, scale, and duration. Increasing any of these three features inevitably incorporates greater complexity and uncertainty into the planning process. With the parallel trends toward plans designed at even larger, landscape scales to monitoring and managing multiple species and ecosystems, and over long time horizons, the challenge of promoting efficient, manageable, and effective areawide multiagency HCPs becomes even greater.

1. Clear and Candid Consideration of Trade Offs

When designing areawide multiagency HCPs and similar large-scale ecosystem-based conservation planning initiatives, deliberate consideration of the trade offs among scope, scale, and duration is likely to be invaluable. Interested authorities may need to explicitly decide whether to concentrate primarily on scope or scale. The more extensive the scope of the HCP, the more modest in scale the plan area may need to be to promote better plan manageability and the likelihood of effective conservation. Similarly, if a larger landscape scale is the authorities' focus, a reduction in the number of issues and species addressed may provide for a more effective and manageable plan.

Political realities will also play a role in balancing scope, scale, and duration with effective planning. The pilot NCCP Scientific Review Panel would have preferred to plan the entire NCCP region as a single entity, but recognizing that this was politically and administratively unfeasible, the Panel recommended division into subregions reflecting the locations of the largest areas of habitat.[121] Ultimately, the subregional boundaries reflected a mix of habitat locations and political realities.[122] Nonetheless, to the extent possible, trade offs among wider scale, scope, and duration should be clearly and candidly considered and addressed at the outset of the scoping of issues for the plan, and choices that escalate the complexity by expanding one dimension are more likely to be effective if accompanied by choices that reduce the complexity for others.

2. Resources That Match Complexity

As explained above, though the advantages are significant, the increased complexity from expanding the scale, scope, and duration is also considerable. The experience of areawide multiagency HCPs is that insufficient attention and resources are given to providing the funding, monitoring, and research commensurate to a plan's increased complexity. Though the provision of sufficient resources for plan implementation is an issue for all HCPs, the problem is particularly acute as complexity increases. In this sense, a plan such as the DRECP can choose to plan over a broad scope and wide scale, but can only do so effectively if it commits extensive resources proportionate to the scale and breadth of the planning task.

3. Reliance on Robust Scientific Apparatus

The increased complexity of managing a large scope of issues over long time horizons in areawide multiagency HCPs requires a robust information-gathering method from the very beginning of the planning process and its continuation throughout the development of the HCP. The CDFW encourages front-loading the planning process with "a strong scientific foundation" and requires early consultation with independent science advisors.[123] Gathering "biologically relevant" information regarding, inter alia, types of habitat occupied by endangered species, the species' habitat requirements with respect to foraging and breeding, and natural and human threats to the species[124] facilitates informed decisions when it comes to determining the appropriate scope, scale, and duration of the HCP.

4. Clear Adaptive Management Protocols

Relatedly, as a plan's complexity increases, so does the extent of uncertainty; as a permit's duration increases, the likelihood of changed circumstances increases. Accordingly, the trends toward increased scale, scope, and duration intensify the pressure for effective adaptive management processes to account for new information and adjust to changed circumstances. Unfortunately, as detailed further in Section V, areawide multispecies HCPs have paid insufficient attention to integrating and encouraging the use of such protocols.

119. Telephone Interview with Chris Beale, Att'y, Res. Law Grp. (Jan. 14, 2015).
120. *See* Kareiva et al., *supra* note 62, at 33.
121. Pollak, *supra* note 64, at 17.
122. *Id.*
123. CDFW, *Guidance Documents*, *supra* note 29.
124. Hood, *supra* note 6, at 13-15.

5. Tiering of Management Decisions

Finally, employment of strategic tiering of planning and management that matches decisionmaking to the planning stage can help deal with complexity and serve to integrate information obtained by ongoing monitoring into the management process. The tiered approach would involve establishing a broad plan in the initial planning stages of the HCP that could then be built upon as more concrete information became available over the time horizon of the plan.[125] Development and implementation of tiered information-gathering and decisionmaking mechanisms to reconcile a longer time horizon with a large scope or scale requires significant and stable resources and an effective mechanism for interjurisdictional problem solving.

III. Promoting Interjurisdictional Problem Solving

Areawide multiagency HCPs are some of the first and most prominent regulatory experiments in interjurisdictional problem solving and coordination. These plans and the California NCCP program developed, at least in large part, as mechanisms for addressing transjurisdictional problems by encouraging the various public authorities to work together and with private stakeholders to develop a common plan for habitat conservation. Yet, allowing for or promoting a more multilateral and participatory process is not without its costs, and the HCP program has certainly experienced those as well.

This section explores the possible benefits and costs of increased communication, collaboration, and/or coordination of private and public parties in habitat conservation planning, management, and implementation. It also reviews the experience of areawide multiagency HCPs to consider the potential circumstances under which more-intensive, multiparty governance processes (such as areawide multiagency HCPs) are likely to be effective.

A. The Benefits of Multiagency Governance

The U.S. Congress intended a flexible HCP program that would encourage "creative partnerships between the public and private sectors."[126] Congress had indicated that HCPs should facilitate comprehensive planning that would encompass multiple landowners, multiple jurisdictions, and multiple species.[127] However, the lack of any express requirements or other incentives to motivate the initial and sustained participation of the full range of potentially interested public and private parties resulted in two general tracks of HCPs: a small number of large-scale, multijurisdictional HCPs actively seek to promote participation and collaboration; and a large number (the vast majority) of HCPs rely on a traditional bilateral form of regulatory decisionmaking.[128]

The conventional bilateral HCP approach has been criticized frequently as leading to patchy, ad hoc mitigation measures that limit the ability to plan for species recovery or prevent species from declining.[129] These two-party agreements between the applicant and the Services, created to mitigate a single project or development, are not designed to prevent habitat fragmentation or foster a comprehensive planning process consisting of diverse interests.[130] In addition, some have contended that the many separate, piecemeal, and duplicative reviews of each development project can create costly delays and uncertainty for local governments, landowners, and developers, and enforcement of the project-by-project approach can be contentious and litigious.[131] For these reasons, the conventional approach has been judged unsatisfactory both to conservation advocates and to development interests.[132]

In contrast to bilateral plans, the San Bruno HCP and the other multijurisdictional MSHCPs were early prototypes of how collaborative planning and implementation can occur. Local or state bodies have developed many areawide multiagency HCPs that outline conservation initiatives and mitigation requirements for identified activities in a specified area.[133] These multipermittee HCPs have adopted a more multilateral, regional approach that seeks to promote the participation of the various affected agencies and interests to develop a comprehensive, coordinated plan.[134]

This evolution was part of a broader trend in the United States seeking to promote interjurisdictional planning and governance. A wide range of scholars and policymakers have suggested that institutional reforms are necessary to achieve the type of creative regulatory responses needed for effective governance in general and endangered species protection and ecosystem management in particular.[135] These proponents asserted that hybrid public/private governance structures, based on information sharing, performance monitoring, and collaborative problem solving, were necessary to promote integrated ecosystem management at the scale discussed above.[136] In this view, parties representing diverse interests at multiple, nested spatial scales can collaborate to develop locally or regionally tailored solutions within broader structures of coordination and public accountability.[137]

125. However, it should be noted that the plan must still have sufficient detail at the initial stage to meet permit issuance requirements, which some assert may be lacking under a "tiered" approach. E-mail from Brenda Johnson, Former Program Manager, Cal. Dept. of Fish & Wildlife, to author (Feb. 19, 2015; 12:15 PST).
126. H.R. Rep. No. 97-835, at 30 (1982) (Conf. Rep.), *reprinted in* 1982 U.S.C.C.A.N. 2860, 2871.
127. Lyons, *supra* note 37, at 102-03.
128. *See, e.g.*, Camacho, *supra* note 14, at 355.
129. Pollak, *supra* note 24, at 8.
130. Karin P. Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heel of the Endangered Species Act*, 6 N.Y.U. Envtl. L.J. 279, 300 (1998).
131. *Id.*
132. Pollak, *supra* note 64, at 7.
133. Jaimee Lederman & Martin Wachs, Transportation and Habitat Conservation Plans 6 (2014).
134. *See* Hood, *supra* note 6, at 41-42.
135. *See, e.g.*, Camacho, *supra* note 14, at 357-58.
136. Bradley C. Karkkainen, *Collaborative Ecosystem Governance: Scale, Complexity, and Dynamism*, 21 Va. Envtl. L.J. 189, 193-94 (2002).
137. *Id.*

Proponents assert that these multiparty processes can lead to better decisions with a higher likelihood of implementation, while simultaneously preparing agencies and stakeholders for potential challenges.[138] Information sharing that occurs in these contexts can build a better understanding of the issues, which allows agencies to educate the public and manage uncertainty[139]; moreover, proponents claim, these collaborative processes can lead to wiser decisions by solving common problems, resolving disputes, and building support for decisions.[140]

Other asserted benefits in the context of areawide multiagency HCPs include reduced planning time, increased quality and quantity of information gathering based on the best available science, enhanced working relationships, increased likelihood of HCP approval and implementation, and decreased likelihood of litigation.[141] Dialogue participants agreed that areawide multiagency HCPs offer the opportunity to increase the connectivity not only among fragmented lands and disparate plans, but also among fragmented regulatory and management institutions.

To further encourage interjurisdictional planning, the California Legislature established the NCCP program as one of the first comprehensive frameworks for regional integrated ecosystem management. A key goal of California's NCCP program was to overcome the limitations of the conventional bilateral approach and encourage interagency cooperation and agreements among local, state, and federal agencies, along with private parties.[142] State and federal wildlife agencies collaborate in overseeing the planning process so that plans can be approved simultaneously under the state NCCP Act and the federal HCP law.[143] By using the NCCP program as a proving ground, FWS could choose to incorporate some of its innovations into policies and regulations governing the federal HCP process.

This experiment in decentralized habitat conservation planning and management is exemplified in the San Diego MSCP,[144] which subdivides the large subregion into 11 planning subareas to implement the broad subregional program. Emphasizing local land use control, the umbrella HCPs are structured to remove regional land use policy from FWS control and give it back to local government.[145] Each jurisdiction within a subarea has the authority to issue its own permits, and the San Diego Association of Governments (SANDAG), the area's Metropolitan Planning Organization (MPO), coordinates land use among all the jurisdictions and works with all area HCPs.[146] Some dialogue participants suggested expanding this experiment with possible pilot efforts, such as coordination among California MPOs and Regional Transportation Planning Agencies, to create a regional integrated planning approach for conservation in the context of infrastructure/development and local, regional, state, and federal planning, policy, and regulation.

B. Challenges and Limitations of Multiagency Governance

Despite the potential benefits of multiagency regional HCPs, these more multilateral and participatory processes also have notable trade offs. The literature and participants in the dialogues identified numerous constraints to collaborative planning for areawide multiagency HCPs.

1. Persistent Regulatory Fragmentation

As the experience of areawide multiagency HCPs has demonstrated, there are barriers to effective implementation of cross-agency planning due to the tension with decentralized land use planning regimes. The HCP program and various areawide multiagency HCPs have been criticized for their fragmented approach to regulation,[147] and the dialogues further reinforced the view that there is a tendency toward agency inertia and operating within defined silos despite the existence of interjurisdictional governance regimes. Moreover, "as U.S. environmental law has ripened over the past few decades, most ecological communities have become subject to a clutter of government programs with limited jurisdiction and information and thus limited capacity to learn and adapt."[148] Such fragmentation creates barriers to intergovernmental learning and the development of responses to large-scale conservation problems.

2. Process Costs and Manageability

Because such interjurisdictional planning arrangements rely on the sustained involvement of virtually all of the relevant, interested parties, they often can take substantial amounts of time and resources to work effectively.[149] Even regional HCPs with more elaborate participatory measures struggle with the competing goals of being responsive to multiple constituents and efficiency.[150] Excessive bureaucratic review and approval processes have resulted in time

138. Julia M. Wondolleck & Steven L. Yaffee, Making Collaboration Work: Lessons From Innovation in Natural Resource Management 23 (2000).
139. *Id.* at 24-30.
140. *Id.* at 30-35.
141. Lederman & Wachs, *supra* note 133, at 84-98; Camacho, *supra* note 14, at 318-19.
142. Pollak, *supra* note 64, at 7.
143. *Id.*
144. Robert L. Fischman & Jaelith Hall-Rivera, *A Lesson for Conservation From Pollution Control Law: Cooperative Federalism for Recovery Under the Endangered Species Act*, 27 Colum. J. Envtl. L. 45, 105-06 (2002).
145. Lederman & Wachs, *supra* note 133, at 19-20.
146. *Id.*
147. Camacho, *supra* note 14, at 357.
148. Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure*, 59 Emory L.J. 1, 26 (2009).
149. Michael McCloskey, *Problems With Using Collaboration to Shape Environmental Public Policy*, 34 Val. U. L. Rev. 423, 429 (2000).
150. Jeremy Anderson & Steven L. Yaffee, Balancing Public Trust and Private Interest: Public Participation in Habitat Conservation Planning 27 (1998).

delays[151] and some participant dissatisfaction.[152] With these delays, there is an increased likelihood that elected official and staff turnover will negatively impact support for the plans and compound process inefficiencies.[153]

As plans grow in size and complexity, time and costs were identified as particularly significant constraints by dialogue participants. Some development interests argue that plans do not go far enough in streamlining the regulatory process.[154] More concretely, the length of time needed to complete the planning process may exceed the amount of time allotted.[155] The lack of adequate funding for plan formation and implementation, discussed in Section IV.C., is a chronic problem. Relatedly, dialogue participants identified manageability issues associated with multilateral approaches. It is difficult to convene working groups of a size that is manageable as well as sustained for potentially interested public and private actors to participate on an ongoing basis. This is particularly difficult in light of the growing trend toward landscape-level planning and even broader geographic scales for areawide multiagency HCPs.

3. Information Deficits and Discrepancies

Dialogue participants also identified the lack of shared information and data as a major hindrance to meaningful participation.[156] A mechanism to facilitate information sharing across jurisdictions and with all interested parties is necessary, as is promoting information comprehension.

4. Legitimacy

Though not of particular concern to dialogue participants, critics of multilateral governance approaches have claimed that such power-sharing arrangements are vulnerable to treating governments as simply stakeholders and can upset traditional models of representative democracy by giving more weight to vocal, well-resourced minorities.[157]

5. Agreement Quality

Some critics have asserted that multilateral governance processes can lead to lowest-common-denominator compromises rather than quality decisions.[158] Given the large number of parties and diverse interests involved, there is a risk that the collaborative process may result in a plan that may represent consensus, but does not reflect the complexities inherently involved in this type of ecosystem management.[159] Relatedly, a consensus, multiparty agreement embodies a bias toward the status quo.[160] Some critics assert that localized conservation collaboration cannot effectively address the magnitude of ecosystem-scale management that implicates multiple jurisdictions, agencies, parties, and remedies.[161] It is important to note that though many participants in areawide multiagency HCPs give favorable reviews, some participants from both industry and environmental organizations are critical.[162]

C. Conditions for Success

Areawide multiagency HCPs provide a range of lessons regarding the possibilities and challenges of cooperative, interjurisdictional habitat conservation. As discussed at the dialogues, there are a number of important factors that are likely to increase the likelihood that interjurisdictional, problem-solving initiatives such as areawide multiagency HCPs will bear fruit.

1. Clear and Efficient Organizational Structure

There is a tension between the decentralized land use planning regime that empowers local governments, and large-scale regional planning that transcends local jurisdictions.[163] There is also a tension between the new model of hybrid public/private governance structures, based on information sharing and collaborative problem solving, and traditional hierarchical governance structures. Successful governing structures for areawide multiagency HCPs typically provided clear and concrete avenues for coordination among many stakeholders in the HCP planning process.[164] Successful implementation requires both a local administrative structure and effective coordination with state and federal partners.[165]

In California, common implementation structures are joint powers authority, private nonprofits, and intergovernmental and interagency committees. For example, the parties to the Western Riverside MSHCP formed a joint powers authority, the Western Riverside County Regional Conservation Authority, for implementation and management of the MSHCP. This "Cooperative Organizational Structure" facilitates collaboration among the permittees and the wildlife agencies and ensures that monitoring and management is consistent across jurisdictional boundaries.[166]

151. Telephone Interview with Jake Li, Dir. of Endangered Species Conservation, Defenders of Wildlife (Dec. 22, 2014) (explaining that demands on the Services' limited resources have resulted in the Services turning away HCP applicants).
152. Anderson & Yaffee, *supra* note 150.
153. Telephone Interview with Trish Adams, Nat'l Habitat Conservation Planning Coordinator, FWS (Dec. 10, 2014).
154. Pollak, *supra* note 64, at 27.
155. Callihan et al., *supra* note 43, at 20.
156. Some participants mentioned that they often have to file Freedom of Information Act requests in order to obtain information.
157. McCloskey, *supra* note 149, at 426, 431.
158. *Id.* at 429.
159. *Id.*
160. *Id.* at 430-31.
161. George Cameron Coggins, *Of Californicators, Quislings, and Crazies: Some Perils of Devolved Collaboration*, *in* Across the Great Divide: Explorations in Collaborative Conservation and the American West 163 (Philip Brick et al. eds., 2001).
162. *See* Karkkainen, *supra* note 136, at 230; Pollak, *supra* note 64, at 28.
163. February Dialogue, *supra* note 3.
164. Lederman & Wachs, *supra* note 133, at 98.
165. *Id.*
166. *Id.*

Streamlining to minimize redundancy and promote learning can mitigate some of the difficulties of interjurisdictional interaction. For example, some commenters have concluded that greater efficiency can be achieved through dedicating a specific FWS staff member in the local office to HCP planning and development, and encouraging that staff member to "triage" and prioritize tasks that cause the greatest delays in the process.[167] This also avoids problems associated with high turnover, lost institutional knowledge, and lack of leadership that occurs when agencies place inexperienced staff in charge of plan development.[168] For federal transportation projects, the Federal Highway Administration (FHwA) has successfully funded a liaison position for HCP development within FWS offices.[169]

However, there may be benefits from allocating independent authority to portions of the regulatory process,[170] or even leveraging private parties to promote more effective implementation.[171] For example, some assert that dividing responsibility for plan implementation from management and monitoring between two distinct entities can result in better data and better-informed management decisions.[172]

San Diego area HCPs have developed an expedited plan implementation process, holding monthly interagency and stakeholder meetings to discuss upcoming projects, set deadlines, and decide on actions for plan implementation.[173] Mitigation activities are streamlined because SANDAG, as the recipient of TransNet funds, works with all area HCPs to coordinate mitigation. This revenue stream makes it both a mitigation tool and an implementation mechanism for the regional plan.[174]

2. An Integrative Approach

In many circumstances, greater efficiency may be achieved through interagency coordination and integrating the disparate permitting requirements according to ecological boundaries such as watersheds. This integration, combined with the mitigation streamlining discussed above, can ameliorate the time and money constraints often associated with large-scale regional planning. For example, several northern California HCPs are pioneering efforts to coordinate permitting for impacts to endangered species and aquatic resources by working with the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency.[175]

3. Open Participation

Particularly for areawide multiagency HCPs, participation and transparency are necessary to promote collaborative planning and implementation. Successful planning processes typically incorporated stakeholder participation, with wildlife agencies, local agencies, development interests, and environmentalists meeting and negotiating over the plans.[176] A well-managed public participation process has the potential to provide significant benefits to applicants, agencies, outside stakeholders, and affected species,[177] as well as broader social benefits such as where to zone open space and how to manage growth.[178] Increased participation by diverse parties is more likely to produce a durable plan because effective public participation and deliberation is one of the most important elements to a plan's ultimate success.[179] At least one court has struck down an ITP for a lack of public deliberation on appropriate mitigation measures and funding assurances.[180]

Though undoubtedly there are challenges with promoting meaningful and broad participation, areawide multiagency HCPs must be designed to be open, transparent, inclusive, and accessible, and to strive for balanced representation. A full range of relevant and diverse interests should be invited and encouraged to contribute to the process with meaningful opportunities for participation.[181] When present, participants generally found the working group process beneficial in enhancing understanding and effective communication, and that it helped environmental representatives in particular accept the reasoning behind the complex decisions being made.[182]

4. Initial Scoping of Issues and Disagreements

HCP processes that were more successful at promoting collaboration often integrated an initial scoping of the issues that identifies the proposed action, concerns, issues, opportunities, considerations, alternatives, impacts, and recommendations.[183] Some encourage use of a neutral facilitator during the process.[184] To the extent there is disagreement among those involved, the intent would be to include an articulation of those disagreements, which may be in the words of those who disagree.[185] Finally, recognizing the

167. *Id.* at 101.
168. *See* Callihan et al., *supra* note 43, at 62.
169. Lederman & Wachs, *supra* note 133, at 101.
170. *See, e.g.*, Callihan et al., *supra* note 43, at 28.
171. *See, e.g.*, *id.*
172. Telephone Interview with Ron Rempel, Former Program Adm'r, San Diego Mgmt. & Monitoring Program (Jan. 16, 2015).
173. Lederman & Wachs, *supra* note 133, at 85.
174. *Id.* at 101-02.
175. *See generally* Alejandro E. Camacho et al., *Emerging Regulatory Experiments in Permit Process Coordination for Endangered Species and Aquatic Resources in California*, 45 ELR 10131 (Feb. 2016).
176. Pollak, *supra* note 64, at 18-19 (noting the San Diego MSCP working group included FWS, the Navy, CDFW, Caltrans, SANDAG, the County Water Authority, the County, five cities, seven conservation organizations, landowners, the Building Industry Association, the County Farm Bureau, SDG&E, and various development companies).
177. Anderson & Yaffee, *supra* note 150, at 4.
178. Thomas, *supra* note 5, at 163.
179. Lederman & Wachs, *supra* note 133, at 84-95.
180. Southwest Ctr. for Biological Diversity v. Bartel, 470 F. Supp. 2d 1118, 1123 (S.D. Cal. 2006).
181. Thomas, *supra* note 5, at 164; Lederman & Wachs, *supra* note 133, at 93-95.
182. Pollak, *supra* note 64, at 19.
183. February Dialogue, *supra* note 3.
184. Callihan et al., *supra* note 43, at 59.
185. *Id.*

need for local input so that plans can be tailored to fit the unique circumstances of the region is critical.

5. Managing Complexity Through Information-Sharing Mechanisms

For some HCPs, participants felt that their ability to influence policy decisions was hindered by the technical complexity of the issues and limited ability to bring technical experts to the table.[186] These planning processes often prove to be more complex than anticipated, perhaps not surprisingly given the many stakeholders and the scope of the plans. Multiagency HCPs tend to be thick documents because they stipulate a diverse range of actions that are allowed or required across multiple ownerships and jurisdictions.[187] However, given the complexity of areawide ecosystem management, regulators and stakeholders will always be working from a chronic shortage of information.[188] The increased expertise offered by the larger number of participants is more likely to produce a plan capable of managing for resilient ecosystems, as climate change and other threats impact species and their habitat.[189]

Accordingly, the key is the integration of a well-funded mechanism to facilitate information sharing across jurisdictions and with all interested parties. An accessible library of HCPs and related documentation, including findings from monitoring programs and implementation evaluations, would enhance participation, transparency, and accountability.[190] Moreover, the Services should facilitate the dissemination of innovative ideas employed by specific HCPs, including perhaps a yearly summary of HCP developments across the country.[191]

6. Resources and Timing

As plans increase in size and complexity, the costs, both transactional and administrative, and time requirements are much greater for areawide multiagency HCPs. Dialogue participants corroborated that this is due to the larger number of parties involved, the inherent costs involved in coordinating and collaborating with multiple agencies and stakeholders, and the volume of information and resources necessary to produce and implement the plan. There is a risk that some applicants will simply choose not to participate in the HCP process given the greater costs involved.

However, a cooperative multiparty approach, as opposed to a potentially more adversarial bilateral approach, may actually reduce time delays and costs by increasing the level of resources available and reducing the likelihood of litigation.[192] Providing sufficient training sessions and resources for parties at the outset of a collaborative planning and implementation process can improve the likelihood of participation and effective problem solving.[193]

7. Strong Incentives to Work Together

The threat of the gnatcatcher listing in southern California and enforcement of the ESA's prohibition on "take" of a listed species destabilized the existing regime of land use and development law.[194] This created an incentive for all parties to engage in genuine collaboration toward a new bargained-for solution that would both protect species and habitat and allow for development to occur.[195] Relatedly, a number of dialogue participants identified the value of strong leadership that encouraged participating authorities to develop an inclusive process but provided sufficient discretion to participants to allow for creative solutions.[196]

Processes also tended to bear fruit when the managing authorities attended to participants' incentives to promote relationship building, institutionalize good behavior, and find common ground. Dialogue participants emphasized that relationship building in areawide HCPs served to promote not only social capital, but more-effective and resilient habitat conservation. This may be the case especially as the duration of plans lengthens, requiring agencies and interested participants to work together over the course of many years.[197]

IV. Funding for Habitat Conservation and Planning

Since the inception of the HCP program, there has been a critical need to find revenue to acquire and manage land for habitat conservation. Funding has often been identified as a significant concern that restrains the effectiveness of the HCP program[198] and inhibits habitat conservation more generally. The inadequacy of funding has plagued all major stages of HCP development, from preparation and planning to long-term implementation, management, and oversight, including monitoring and adaptive management protocols. At least two HCPs have been struck down by courts because of inadequate funding mechanisms.[199]

Beyond the HCP program, funding for habitat conservation often has been provided on a very ad hoc basis, and revenue streams are often not guaranteed.[200] Observers identify funding as a key challenge for the future because many funding mechanisms for habitat conservation have

186. Pollak, *supra* note 64, at 19.
187. Thomas, *supra* note 5, at 153.
188. Karkkainen, *supra* note 136, at 205.
189. *Id.*
190. Thomas, *supra* note 5, at 167.
191. Lederman & Wachs, *supra* note 133, at 89.
192. *Id.* at 94.
193. *Id.* at 89.
194. Bradley C. Karkkainen, *Getting to "Let's Talk": Legal and Natural Destabilizations and the Future of Regional Collaboration*, 8 Nev. L.J. 811, 816-17 (2008).
195. *Id.*
196. *See* Callihan et al., *supra* note 43, at 59.
197. Telephone Interview with Ron Rempel, *supra* note 172.
198. *See, e.g.*, Thomas, *supra* note 5, at 155.
199. Sierra Club v. Babbitt, 15 F. Supp. 2d 1274, 1280-82 (S.D. Ala. 1998); National Wildlife Fed'n v. Babbitt, 128 F. Supp. 2d 1274, 1278 (E.D. Cal. 2000).
200. Robert L. Fischman, *Predictions and Prescriptions for the Endangered Species Act*, 34 Envtl. L. 451, 471-75 (2004).

been susceptible to failure.[201] As such, in addition to providing insights for improving the HCP planning and implementation process itself, a review of funding under the HCP program and other related efforts to fund habitat conservation offers lessons for the future in developing effective methods for providing funding for habitat conservation in other resource management programs as well.

A. *HCP Funding Requirements and Stages*

Under the ESA, an HCP submitted in support of an ITP application must specifically detail the funding that will be made available to undertake monitoring, minimization, and mitigation of likely impacts resulting from the proposed take of the species for which permit coverage is requested.[202] The applicant must demonstrate an ability to provide the requisite level of funding for these activities prior to permit approval.[203] However, while funding obligations for HCP implementation must be met after permit issuance, actual possession of the funds is normally not required prior to permitting.[204]

Adequate funding is needed for each of the three main stages of the HCP: planning and agreement formation; initial implementation of the HCP agreement (primarily land acquisition); and long-term implementation and adaptive management.[205] Dialogue participants emphasized that funding must be tailored to each stage, as each has distinct challenges and opportunities.[206] Costs associated with the initial planning stage include research of biology, social impacts, and economics, as well as meetings, preparation, negotiation of documents, and regulatory processing.[207] Inadequate funding in the planning stages may cause the HCP to fail before permitting ever occurs.[208]

Participants in the dialogues were particularly concerned with implementation funding. The short-term and long-term implementation stages include land acquisition, habitat management, biological monitoring, monitoring for compliance and naturally occurring changed circumstances, reporting, and agency/organization oversight (the institution responsible for implementing the HCP). Funding requirements typically include onsite measures during project implementation and onsite and offsite measures required after completion of the project.[209] As detailed below, the funding of adaptive management during the long-term implementation stage has been difficult to address and too often neglected.[210]

201. Hood, *supra* note 6, at 50.
202. 16 U.S.C. §1539(a)(2)(A)(ii) (2014); HCP Handbook, *supra* note 7, at 3-10, 3-33.
203. 16 U.S.C. §1539(a)(2)(B)(iii).
204. *Id.* Michael J. Bean et al., Reconciling Conflicts Under the Endangered Species Act: The Habitat Conservation Planning Experience xii (1991).
205. Bean et al., *supra* note 204, at 15.
206. December Dialogue, *supra* note 3.
207. Bean et al., *supra* note 204, at 15.
208. Lederman & Wachs, *supra* note 133, at 51.
209. HCP Handbook, *supra* note 7, at 3-33 to 3-34.
210. Emily Gardner, *Adaptive Management in the Face of Climate Change and Endangered Species Protection,* 40 Ecology L.Q. 229, 232 (2013).

B. *Types and Examples of HCP Funding*

While the ESA requires proof of funding for HCPs, it does not specify *how* HCPs will be funded; consequently, a variety of mechanisms have been developed from private and public sources.[211] The Services do not explicitly endorse one funding method over another; the applicant(s) must determine the most appropriate source of HCP funding and then adequately demonstrate that the funding is assured in order for the Services to approve the funding mechanism.[212] Primary sources of funding for HCPs include the following categories and mechanisms.

1. Direct Landowner/Developer Funding

Because the ESA requires the applicant to demonstrate adequate funding, direct landowner/developer funding ultimately serves as a backstop to all other types of HCP funding.[213] While much scholarship regarding areawide multiagency HCPs focuses on multiple-payer HCPs, the single landowner/developer HCP presents at least as many challenges because it focuses all burden for maintaining funding on a single source. During the planning stage, the main drawback for the single landowner/developer funding model is the potential for bankruptcy or the need to sell off holdings before the plan period ends.[214] Implementation with a single landowner/developer presents its own challenge, as it requires the developer to remain connected to the project long after all transfers of land interests are completed.[215]

2. Local Government Funding

Local government funding for planning of HCPs may come from the city or county's general fund, landfill tipping fees, contributions from special districts, or other local agencies. Local funding has also come from voter-approved increases in local sales taxes to fund conservation measures. In the Western Riverside MSHCP, a condition for local agencies to access funds from a voter-approved transportation bond measure was to "participate" in the HCP; this "participation" equals $121 million in HCP funding.[216]

In San Diego County, a half-cent sales tax (TransNet) was renewed in 2004 for funding HCP mitigation.[217] To offset impacts caused by the construction of transportation projects, the TransNet Environmental Mitigation Program (EMP) set aside $40 million for the first 10 years for implementation, management, and monitoring of the San Diego HCPs.[218] In addition, the EMP buys large parcels of land

211. Hood, *supra* note 6, at 47.
212. E-mail from Dan Cox, Habitat Conservation Planning Coordinator, FWS, to author (Jan. 5, 2015, 3:46 PST).
213. Hood, *supra* note 6, at 47.
214. *Id.*
215. *Id.*
216. Lederman & Wachs, *supra* note 133, at 76.
217. TransNet, *Environmental Mitigation Program*, http://www.keepsandiego-moving.com/EMP/EMP-intro.aspx (last visited Dec. 23, 2015).
218. *Id.* (click on "Management & Monitoring" tab).

early at lower prices, resulting in cost savings that are then put toward management and monitoring of the HCPs.[219] The TransNet EMP serves as a model for other cities and counties looking to build a permanent revenue stream for HCP mitigation, monitoring, and management.[220]

3. State Funding

On the state level, funds may come from a diverse range of sources. For conservation plans in which the permittee is a government agency, funding may be appropriated by the state legislature every year.[221] State-level agency funding for HCPs in California has come from various agencies, including the state Department of Transportation (CalTrans), which contributed funds toward the East Contra Costa and Butte County HCPs and participates as a paying permittee in the Western Riverside and Coachella Valley MSHCPs.[222]

State grant funding, including grants made available through voter approval of state bonds, is another potential source of funding. The California Wildlife Conservation Board utilizes a portion of state bond funding to implement NCCPs, with an emphasis on land acquisition.[223] The California Department of Parks and Recreation's Habitat Conservation Fund also provides annual grant funding for wildlife conservation.[224] CDFW also sponsors the NCCP Local Assistance Grant Program, which "provides state funds for urgent tasks associated with implementation."[225]

Cap-and-trade auction revenue, pursuant to the 2006 California Global Warming Solutions Act (AB 32), may be a future source of conservation planning funding. In 2013, the California Air Resources Board released an investment plan that recommends providing funding to "develop and implement NCCPs to maximize conservation and carbon sequestration benefits."[226]

4. Federal Funding

FWS administers the Cooperative Endangered Species Conservation Fund (ESA §6 funding) for planning and implementing HCPs.[227] Since 2003, the program has been funded through the Land and Water Conservation Fund (LWCF), and funds are awarded on a nationwide competitive basis.[228] For planning purposes, states may apply to the HCP Assistance Fund, while the purchase of HCP lands may be funded in part through the HCP Land Acquisition Fund.[229] For land acquisition, §6 funding is limited to acquisition of land that goes beyond compensation (furthering the mitigation required by the HCP and/or contributing to species recovery), and cannot be used for compensatory mitigation (land acquisition that offsets effects of covered projects).[230] Section 6 grants are one of the most common sources of funds for HCP planning. However, even though the number of approved HCPs needing funding continues to grow, annual Cooperative Endangered Species Conservation Fund appropriations have decreased dramatically over the past decade.[231]

Since 2001, FWS has also awarded state wildlife grants (SWG) for the "development and implementation of programs for the benefit of wildlife and their habitat."[232] In 2008, Congress established the SWG Competitive Grant Program with a special focus on promoting and advancing cooperative partnerships that result in large-scale landscape conservation.[233] FWS also administers the Partners for Fish and Wildlife Program, which provides technical and financial assistance to private landowners to help meet the habitat needs of federal trust species.[234]

Other less-known federal funding opportunities exist for habitat conservation more generally.[235] Beginning in 2012, the Community Forest and Open Space Conservation Program offers funds through the 2008 Farm Bill for habitat acquisition.[236] Launched in 2004, the Readiness and Environmental Protection Initiative allows the U.S. Department of Defense to foster innovative land conservation partnerships to preserve buffer zones around military bases.[237] The Healthy Forests Reserve Program was established in 2003 to promote the recovery of endangered species and increase carbon sequestration.[238]

5. Energy, Sales, and Development Taxes

With this funding model, HCP and other conservation programs are funded by local, regional, state, and federal taxes on energy (electricity, oil, gas), water, utilities, sales (general, real estate), and development. The San Diego TransNet funds are an example of this funding

219. *Id.*
220. Telephone Interview with Dan Silver, Exec. Dir., Endangered Habitats League (Dec. 1, 2014).
221. Hood, *supra* note 6, at 48.
222. Lederman & Wachs, *supra* note 133, at 73-75.
223. Funding for the Wildlife Conservation Board comes from Propositions 40, 50, and 84. Cal. Wildlife Conservation Bd., *Wildlife Conservation Board Funding*, https://www.wcb.ca.gov/Funding-Sources (last visited Dec. 28, 2015).
224. Cal. Dep't of Parks & Recreation, *Habitat Conservation Fund*, http://www.parks.ca.gov//?page_id=21361 (last visited Dec. 28, 2015).
225. CDFW, *Grants for NCCPs and HCPs*, *supra* note 28.
226. Cap and Trade Auction Proceeds Investment Plan (2013), *available at* http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/final_investment_plan.pdf.
227. FWS, *Endangered Species Grants*, http://www.fws.gov/endangered/grants/ (last visited Dec. 23, 2015).
228. *Id.*
229. *Id.*
230. *Id.*
231. Cal. Habitat Conservation Planning Coal., Conserving Natural Resources Facilitating Economic Development 2 (2014).
232. FWS, *Wildlife & Sport Fish Restoration Program*, http://wsfrprograms.fws.gov/Subpages/GrantPrograms/SWG/SWG.htm (last visited Jan. 26, 2015).
233. *Id.*
234. FWS, *Partners for Fish and Wildlife Program*, http://www.fws.gov/partners/ (last visited Dec. 23, 2015).
235. Andrew Dillon & Andrew du Moulin, The Trust for Pub. Land, Under-Recognized Federal Programs for Habitat Conservation, *available at* www.eoearth.org/files/198801_198900/198836/under-recognized-federal-programs-for-habitat-conservation.pdf.
236. *Id.* at 7.
237. *Id.* at 9.
238. *Id.* at 19.

type.[239] Most state fish and wildlife agencies derive the bulk of their budget from the sale of hunting and fishing licenses and matching federal dollars from the Wildlife and Sport Fish Restoration Program.[240] At the federal level, the Pittman-Robertson Act imposes an excise tax on hunting equipment, and revenues are used toward wildlife habitat.[241]

The LWCF is a primary source of federal funding for states and federal agencies to conserve habitat. LWCF revenue is primarily generated from annual royalties paid by energy companies drilling for oil and gas on the outer continental shelf, and collection is authorized up to $900 million, subject to congressional appropriations.[242] However, nearly every year, Congress diverts much of this funding to nonconservation purposes, resulting in a substantial backlog of federal and state land acquisition projects.[243]

6. Development Assessments

Development assessments are used in HCPs by single and multiple landowners for acquiring habitat and ongoing management measures. Beginning with the San Bruno HCP, development assessments have been the standard method of funding HCP implementation.[244] These assessments may apply across an entire HCP area regardless of whether affected species are present on a given parcel, or they may apply only (or at an increased amount) when particular land includes affected species habitat.

Density bonuses are a new type of assessment introduced for the Western Riverside MSHCP, where developers acquire the right to develop an additional 25% increase in density by providing enhancements to their projects and by paying a "Density Bonus Fee" of $3,000-$5,000 per additional unit.[245] The MSHCP assumes that 10-20% of the residential units built in the unincorporated county area will participate in density transfers; due to the recession that began in 2008, less development has meant less developer impact fees and thus reduced funding for the HCP.[246]

7. External Private Funding

Foundations and nonprofit organizations have been particularly useful in securing funding for the planning stage of HCP preparation. The Nature Conservancy has also pioneered conservation-related impact investing, launching a division that will deploy $1 billion in conservation funding over the next three years.[247]

8. Mitigation Banks

Mitigation banking is a mechanism for implementing compensatory mitigation where public or private institutions acquire and hold habitat for conservation purposes and provide mitigation credits to a developer who is required to provide such mitigation as an incident of its project.[248] These arrangements take a variety of forms and include projects managed by national nonprofit organizations as well as smaller nonprofit and for-profit mitigation banks. An HCP mitigating in excess of its own requirements could sell the excess as credits to other projects, so that mitigation itself serves as a source of HCP funding.[249] Banks may be particularly effective if they are used when compensatory mitigation is carried out in advance of foreseeable future projects, or when a single large mitigation action compensates for the impacts of multiple future development projects.[250]

C. Challenges for Funding

The ESA's HCP program does not establish a comprehensive regime for the funding of habitat conservation, including habitat acquisition, planning, and implementation. Accordingly, there are considerable challenges for areawide multiagency HCPs, especially for those that seek to promote more comprehensive habitat conservation beyond the mitigation of the direct habitat effects of planned development. The LWCF (used for ESA §6 grants) has not been fully funded, and the use of LWCF funds has changed little since its inception in 1964.[251] Moreover, most governmental agencies have insufficient funding to conduct major long-term planning for habitat conservation, and the growing number and magnitude of HCPs has exacerbated the problem of locating adequate funding.[252] Participants at the dialogues identified the following additional hurdles.

1. Lack of Broad Political Support Historically

As discussed during the dialogues, it is difficult to garner the broad legislative support necessary for national or even state funding because HCPs largely have been focused within a few biodiversity hot spots, including California, Florida, and Texas. In addition, development interests and even some public entities have treated habitat

239. TransNet, *supra* note 217.
240. FWS, *Wildlife & Sport Fish Restoration Program*, *supra* note 132.
241. Wildlife Restoration Act (Pittman-Robertson Act), 16 U.S.C. §669; Dillon & Moulin, *supra* note 235, at 15.
242. Land and Water Conservation Fund, *What Is the Land and Water Conservation Fund?*, http://lwcfcoalition.org/about-lwcf.html (last visited Dec. 23, 2015).
243. *Id.*; Fischman, *supra* note 200, at 473.
244. Thornton, *supra* note 22, at 622.
245. Western Riverside Multiple Species Habitat Conservation Plan (2003), *available at* http://www.wrc-rca.org/Permit_Docs/mshcp_vol1.html.
246. Michelle Ouellette & Charles Landry, *The Western Riverside County Multiple Species Habitat Conservation Plan: Looking Forward After Ten Years*, 29 Nat. Resources & Env't 1 (2015).
247. Telephone Interview with Elizabeth O'Donoghue, Dir. of Infrastructure & Land Use, The Nature Conservancy (Jan. 23, 2015); NatureVest & EKO, Investing in Conservation: A Landscape Assessment of an Emerging Market (2014).
248. DOI Mitigation Strategy, *supra* note 95, at 3.
249. *Id.*
250. *Id.*
251. Ken Salazar et al., America's Great Outdoors: A Promise to Future Generations (2011), *available at* www.doi.gov/americasgreatoutdoors/documents/upload/AGO-Report-With-All-Appendices-3-1-11.pdf.
252. Fischman, *supra* note 200, at 474.

conservation as a regulatory hurdle to oppose, and they often have been reluctant to support funding for wildlife agencies and conservation that might reduce funding for urbanization and infrastructure.[253]

2. Increased Complexity, Uncertainty, and Costs

As HCPs and habitat conservation efforts have grown in size and complexity, the time and cost required to complete and implement projects has increased dramatically, in part because of the growth in the number and diversity of agencies and interests involved and the increasing technical competence required (which includes increases in the information required). Though there are clear benefits to this larger-scale multilateral approach, the increased complexity is accompanied by increased planning, implementation, and monitoring costs. The initial focus of mitigation funding was on the acquisition of habitat to be conserved and less on the costs of monitoring, ongoing management, restoration of habitat, or adaptive management to account for changed circumstances or new information. As reflected in the dialogues, these post-acquisition costs are now being consistently acknowledged, especially where the lands that were acquired and managed comprise small fragmented parcels, which are relatively more expensive to manage.

Further, lack of funding often significantly hinders the development and implementation of adaptive management plans,[254] which are of crucial importance as they address the possibility of new information or changed circumstances. This stage is too often overlooked and not provided for sufficiently in the crafting of an HCP.[255] If included and made a condition of every permit, it would require increased funding commitments. However, it is vital for advancing long-term habitat and species conservation through the planned management of both foreseeable and unforeseeable ecological changes, particularly in light of climate change.

D. Lessons for Addressing Identified Funding Challenges

The recent trend toward areawide multiagency HCPs has illustrated the importance of reliable funding for this type of cross-agency, multifaceted ecosystem planning. As the plans grow in size and complexity, so do the challenges, particularly the challenge of securing adequate funding to accomplish the myriad goals identified in the plans. Several lessons from recent and current HCP planning efforts are identified below.

1. Seek Diverse and Innovative Funding Sources

A diverse and growing array of funding sources exists at the local, state, and federal level, as well as from private sources. Agencies and organizations working to conserve priority habitat areas have traditionally only tapped into the well-known federal conservation programs such as the LWCF and the Forest Legacy Program, yet a recent presidential report lists 150 federal programs that in varying degrees address habitat conservation.[256] California HCPs have made some effort to seek diverse funding sources, using state water bond and parks bond funding, local tax revenue, private donations, and in-lieu land donations,[257] and considering tapping into private impact investment.[258] Additionally, revenue from California's cap-and-trade auctions may be available in the future for HCPs/NCCPs in California that help reduce or mitigate greenhouse gas emissions.[259]

As discussed at the December 2014 dialogue, to address the need for a reliable funding source that would enable the Western Riverside County Regional Conservation Authority to complete land acquisition while prices are relatively low, proponents of the Western Riverside MSHCP have lobbied Congress for a federal revolving fund to provide loans that are repaid over time with proceeds from local sources, including taxes and exactions.[260] FHwA and the Secretary of Transportation also expressed interest in facilitating areawide HCPs because the plans enable the prompt delivery of large-scale infrastructure, particularly transportation projects.[261] The lesson from Western Riverside is that local governments may be able to access new financing sources at reduced borrowing costs by integrating HCPs with long-range comprehensive planning—including transportation planning and general plans.[262]

2. Build a Broad Coalition

A broad coalition of diverse interests, such as infrastructure agencies and industries that rely on natural resources and amenities (beaches, resorts, nature tourism), is invaluable for achieving the level of funding needed for successful areawide, multiagency HCPs. Dialogue participants emphasized that incentivizing land developers and public agencies to support habitat conservation will help build this alliance both regionally and nationally.

A prominent example of a broad coalition is the California Habitat Conservation Planning Coalition (Coalition), which consists of over 30 federal, state, and local agencies, conservation organizations, and businesses. Formed in 2009, one of their goals is to increase funding for HCPs and

253. February Dialogue, *supra* note 3.
254. Gardner, *supra* note 210, at 240.
255. Camacho, *supra* note 14, at 328-35.
256. Salazar et al., *supra* note 251, at 5.
257. December Dialogue, *supra* note 3.
258. Telephone Interview with Elizabeth O'Donoghue, *supra* note 247.
259. Cap and Trade Auction Proceeds Investment Plan, *supra* note 226.
260. Legislation introduced by Sen. Dianne Feinstein (D-Cal.) and Rep. Ed Royce (R-Cal.), the Infrastructure Facilitation and Habitat Conservation Act of 2013, H.R. 2280, 113th Cong. (2013), would provide loans and loan guarantees for HCP land acquisitions.
261. Telephone Interview with Douglas Wheeler, Consultant for Western Riverside County Regional Conservation Authority (Dec. 18, 2014).
262. Douglas P. Wheeler & Ryan M. Rowberry, *Habitat Conservation Plans and the Endangered Species Act*, *in* Endangered Species Act: Law, Policy, and Perspectives 221, 234-40 (Donald C. Baur & Wm. Robert Irvin eds., ABA Section of Environment, Energy & Resources, 2d ed. 2010).

NCCPs. To further this goal, they have recently worked at the state level to promote funding in the Water Bond bills and Park Bond legislation, and have sought funding for regional conservation plans through the annual budget allocation of cap-and-trade auction revenue under California's Global Warming Solutions Act (AB 32).

The Coalition stresses the importance of highlighting the economic benefits of conservation in order to gain greater support.[263] At the national level, the Coalition is working to build broad bipartisan support in Congress for HCP funding.[264] Various dialogue participants identified the value of a coalition in increasing funding for acquisition and implementation efforts, and suggested the possibility that a broader network would be beneficial. As a result, the Coalition has helped establish a national coalition of large-scale HCPs.

3. Potential for Statewide Habitat Conservation Funding

Though dialogue participants recommended that those developing and implementing HCPs should be creative and seek out the diverse suite of available sources of funding, these participants also expressed concern that HCP funding is divided in a dizzying array of "piecemeal" and "ad hoc" private, federal, state, and local sources.[265] Some also were troubled that certain HCPs rely too heavily on local sources, anticipating that at least 50% of conservation planning funding will come from nonfederal and nonstate sources, and identifying this as a particularly serious issue for some of the rural areas in which conservation planning occurs.[266] Accordingly, many are advocating for the need for broader, more stable sources of funding for habitat acquisition, conservation planning, and plan implementation. The development of statewide funding programs that leverage broad funding streams to promote habitat conservation, such as Florida's recently approved constitutional amendment,[267] can considerably boost funding certainty and promote more comprehensive approaches to habitat conservation.

4. Front-Load Costs and Advance Mitigation

One proven approach to funding challenges, particularly for areawide multiagency HCPs, is to front-load the funding requirements to the greatest extent possible. This strategy anticipates long-term fluctuations in the value of land to be purchased as HCP mitigation lands, while minimizing the risk that various stakeholders will be unable to meet their long-term commitments. As dialogue participants highlighted, greater assurances of funding at earlier stages would allow for comprehensive planning that better integrates the different stages of the HCP. Given the Services' No Surprises policy, the use of performance bonds or other contingency funding mechanisms (where the funds would be used if additional mitigation became necessary) is recommended, particularly for plans that are in effect for multiple decades.[268]

During the dialogues, advance mitigation was identified as an efficient approach for many areawide multiagency HCPs. Advance mitigation is the "proactive acquisition and restoration of lands for mitigation in advance of anticipated future impacts."[269] It may potentially reduce HCP funding requirements through reduced overall permitting time, lower permitted mitigation ratios, and reduced monitoring costs achieved through economies of scale.[270] Mitigating in advance allows for more-efficient project approvals, more certainty to cost estimates, and takes advantage of conservation opportunities before important land is lost to conversion.[271] Advance mitigation can also provide greater predictability and certainty in the design, development, and implementation of projects by avoiding the need for late project revisions and analyses and by providing for coordination and consistency among agencies.[272] This can serve to reduce project costs and promote operational certainty in a time of rapidly changing climate.[273]

A common theme during the December 2014 dialogue was the need to integrate infrastructure planning agencies, such as transportation planning, much earlier and more effectively in regional HCP processes. By adopting early regional mitigation needs assessment and planning for habitat-level impacts from multiple infrastructure projects, agencies save both time and money. Early adoption also generates ecological benefits due to economies of scale, and earlier mitigation implementation means potentially developable but ecologically crucial parcels may still be available for conservation.[274] Increasingly, transportation agencies and others involved in infrastructure development see the value of integrating advance mitigation into infrastructure planning. It can help streamline the process while promoting more comprehensive prospective habitat conservation by allowing conservation plans to leverage portions of

263. December Dialogue, *supra* note 3 (noting Coachella Valley's success in gaining political support for their HCP by emphasizing its ability to accelerate the delivery of a transportation project).
264. Telephone Interview with John Hopkins, *supra* note 31.
265. February Dialogue, *supra* note 3.
266. *Id.*
267. Jennifer Portman, *Amendment 1 Would Commit State Money to Conservation*, Tallahassee Democrat (Oct. 17, 2014, 5:38 PM), http://www.tallahassee.com/story/news/local/state/2014/10/05/amendment-commit-state-money-conservation/16791933 (stating Amendment 1 will dedicate revenue from an existing tax on real estate transactions to the state's Land Acquisition Trust Fund to acquire, restore, improve, and manage conservation lands).
268. Hood, *supra* note 6, at 51.
269. Keith Greer & Marina Som, *Breaking the Environmental Gridlock: Advance Mitigation Programs for Ecological Impacts. Environmental Practice*, 12 Envtl. Prac. 228 (2010).
270. *Id.* at 227.
271. *Id.*
272. Telephone Interview with Jake Li, *supra* note 151 (stating that advance mitigation is a potential solution to balancing adaptive management and the No Surprises policy).
273. Greer & Som, *supra* note 269.
274. James H. Thorne et al., *Integration of Regional Mitigation Assessment and Conservation Planning*, 14 Ecology & Soc'y 47 (2009).

transportation funding that is dedicated to meeting environmental permitting requirements.[275]

California's Regional Advance Mitigation Planning (RAMP)[276] provides a good model as it allows for landscape-level planning for mitigation independent of individual projects.[277] This landscape-level approach aids in identifying the best opportunities for high-level mitigation to meet conservation needs.[278] In San Diego County, the TransNet EMP allows SANDAG to buy land early, at lower costs, and bank the land for future needs. It is estimated that $200 million in economic savings could be achieved for all the transportation projects identified under the 40-year Regional Transportation Plan by investing in advance mitigation while also assisting with the habitat conservation efforts of the NCCP.[279] Western Riverside has also undertaken recent efforts to develop a Comprehensive Integrated Plan that will address conservation together with transportation and housing.[280] As funding devolves to the local level, dialogue participants agree that there will be many opportunities to integrate transportation planning and funding with local conservation initiatives.

Indeed, recent high-profile federal initiatives emphasize the importance to streamlined infrastructure development of advanced planning and mitigation systems. As provided for in a March 2012 Executive Order,[281] May 2013 Presidential Memorandum,[282] Interior Secretary Jewell's October 2013 Secretarial Order,[283] and DOI's April 2014 Strategy implementing the Secretary's order,[284] there is a growing recognition of the value of planning for, funding, and implementing a further array of mechanisms that promote prospective habitat conservation by tying it to infrastructure development and mitigation.[285] Further, because the demand for conservation measures typically has been in direct response to proposals for development—a time at which the open space involved has increased in value with the prospects of development[286]—the benefits of advance mitigation efforts and early funding, as well as landscape-scale conservation, are becoming increasingly evident.[287]

Funding can be challenging for advance mitigation itself, as the mitigation site must be constructed several years in advance of permitting.[288] Yet land acquisition funding is often dependent on development fees or tax revenues that are collected concurrently with or after development.[289] The state of Washington provides a solution by offering funding for early mitigation work through the Advanced Environmental Mitigation Revolving Account.[290] The opportunity to use advance mitigation to conduct areawide conservation provides a greater likelihood of conservation success and the ability to avoid disruption of habitat.[291]

Typically, only entities developing infrastructure projects have the funds for advance mitigation, while private development projects rely on future development to generate funds for the plan.[292] Nonetheless, as the recent strategies by the president and DOI make clear, there is considerable momentum toward adopting prospective, more comprehensive approaches to habitat conservation that facilitate a more stable funding regime.

V. Managing for Uncertainty and Change

Ecological systems are exceptionally complex and dynamic, and knowledge about these systems and the effects of human activities is inevitably limited. From the beginning of the HCP program, areawide multiagency HCPs have been faced with how to appropriately manage uncertainty about ambient conditions, the potential effects of development and other human activities, the effectiveness of proposed and adopted conservation measures, and potential changes in conditions. Areawide multiagency HCPs attempt to manage these conservation issues over "significant time horizons"[293] and considerable geographic scales. Species and their habitat that areawide multiagency HCPs strive to conserve are not static entities.[294] The relationship between species and their habitat is dynamic, and the processes of the ecosystems they make up are constantly changing.[295]

In this sense, uncertainty is a characteristic feature of habitat conservation. Over time, the HCP program has developed mechanisms and policies that seek to manage these uncertainties and allocate the risk among the various private and public parties and participants to the HCP. The HCP program, and in particular areawide multiagency HCPs, have attempted to manage uncertainty and changed circumstances through three relevant efforts—contingency planning, adaptive management, and the No Surprises policy.

This section analyzes the evolution of the HCP program's experience with managing uncertainty and change, including the reasons provided for (and criticisms of) adopted protocols, and the lessons that have developed as these measures have been implemented. An

275. December Dialogue, *supra* note 3.
276. Regional Advance Mitigation Planning, https://rampcalifornia.water.ca.gov/ (last visited Jan. 27, 2015).
277. Telephone Interview with Elizabeth O'Donoghue, *supra* note 247.
278. *Id.*
279. Greer & Som, *supra* note 269, at 233.
280. *Id.*
281. Improving Performance of Federal Permitting and Review of Infrastructure Projects, Exec. Order No. 13604, 3 C.F.R. 237 (Mar. 22, 2012).
282. Memorandum on Modernizing Federal Infrastructure Review and Permitting Regulations, Policies, and Procedures, 2013 Daily Comp. Pres. Doc. DCPD201300346 (May 17, 2013).
283. DOI Secretarial Order No. 3330, *supra* note 51.
284. DOI Mitigation Strategy, *supra* note 95.
285. David J. Hayes, *Addressing the Environmental Impacts of Large Infrastructure Projects: Making "Mitigation" Matter*, 44 ELR 10016 (Jan. 2014).
286. For example, the cost of land required to be purchased for the Western Riverside MSHCP has doubled since the HCP was drafted. Lederman & Wachs, *supra* note 133, at 67.
287. *Id.*
288. December Dialogue, *supra* note 3.
289. *Id.*
290. Washington State Dep't of Transp., *Advance Mitigation*, http://www.wsdot.wa.gov/Environment/Wetlands/Mitigation/AdvanceMitigation.htm.
291. *Id.*
292. E-mail from Dan Cox, to author, *supra* note 212.
293. Bernazzani et al., *supra* note 113, at 1104.
294. *See* Doremus, *supra* note 8, at 229.
295. *See id.* at 226.

assessment of these efforts provides valuable lessons for areawide multiagency HCPs and the HCP program more broadly as they continue to evolve, particularly in the face of the growing need to address climate change and its impact on endangered species and their habitat. As some of the earliest governance experiments that intentionally sought to integrate more adaptive approaches to habitat conservation planning, the experience of areawide multiagency HCPs also should provide useful information on managing uncertainty and change for other parallel efforts that seek to promote habitat conservation more generally.

A. *Contingency Planning and Adaptive Management*

Contingency planning is a method of managing for changed circumstances by developing alternative strategies to address contingencies.[296] The Services encouraged contingency planning fairly early in the HCP program, stating in the HCP Handbook adopted in 1996 that "participants should ensure that techniques used are proven and reliable or, if relatively new, that contingency measures . . . are included to correct for failures."[297] In addition, §10 regulations require applicants to engage in contingency planning for changed circumstances that are reasonably foreseeable.[298] The Services make a distinction between reasonably foreseeable changed circumstances, where contingency planning is required, and unforeseeable circumstances, where the Services provide assurances that no additional requirements will be imposed, as explained below.[299]

Adaptive management, on the other hand, is management with an experimental design[300] embedded in the HCP's provisions: monitoring for implementation compliance and effectiveness based on explicitly stated goals and measurable indicators, continuous and systematic learning from monitoring data, and redesigning the HCP based on the knowledge gained through the process.[301] In the HCP Addendum, the Services distinguish adaptive management from contingency planning. Adaptive management is "a more experimental approach," while contingency planning involves the "implementation of measures in the event of changed circumstances where there is little uncertainty."[302] The Services explain that "an adaptive management strategy is essential for HCPs that would otherwise pose a significant risk to the species at the time the permit is issued due to significant data or information gaps."[303] The NCCP Act goes a step further and requires that all plans integrate "adaptive management strategies that are periodically evaluated and monitored."[304]

B. *The No Surprises Policy*

In light of the 1982 Amendments to the ESA, the Services wanted to provide a "clearer policy associated with the permit regulations . . . and regarding the assurances provided to landowners entering into an HCP."[305] This led to the development of the No Surprises policy[306] in order to provide "economic and regulatory certainty regarding the overall cost of species conservation and mitigation."[307] Many also state that the policy was "designed primarily to create incentives for applicants to complete HCPs,"[308] and point to this policy as a significant reason for the rapid proliferation of HCPs between 1992 and 2000.[309] In 2000, the HCP Handbook was revised to include the No Surprises policy and the five-point policy, which was intended to "further enhance the effectiveness of the HCP process in general through expanded use of five concepts, including permit duration, public participation, adaptive management, monitoring provisions, and biological goals."[310]

Though obligating applicants to address foreseen circumstances identified at the formation of the HCP, the No Surprises policy places the financial burden on the Services if unforeseen circumstances take place during implementation of the HCP that require a change in management strategy.[311] It assures the applicant that, in the event of unforeseen circumstances, no new land use restrictions will be imposed on the applicant and no "commitment of additional land, water, or financial compensation" will be required.[312] Thus, the No Surprises policy shifts responsibility for implementing conservation measures that may become necessary in the future away from the landowner and onto the federal government.[313] The certainty provided by the No Surprises policy gives landowners strong incentive to develop HCPs in order to shield themselves from future listings.[314]

C. *Lessons From Areawide Multiagency HCPs*

Monitoring is a crucial component of effective HCP management because it provides information on whether an HCP is meeting its objectives.[315] It is a mechanism for determining whether changed circumstances have arisen or new information has become available. By monitoring a take's impact on the species and habitat as well as the

296. HCP Handbook Addendum, *supra* note 48, at 35243.
297. HCP Handbook, *supra* note 7, at 3-22.
298. *See* 50 C.F.R. §§17.22(b)(1)(iii)(B), 17.32(b)(1)(iii)(B) (2014).
299. George F. Wilhere, *Adaptive Management in Habitat Conservation Plans*, 16 Conservation Biology 20, 24-25 (2002).
300. HCP Handbook Addendum, *supra* note 48, at 35252.
301. *See* Thomas, *supra* note 5, at 156; Holly Doremus et al., Ctr. for Progressive Reform, Making Good Use of Adaptive Management 2 (2011).
302. HCP Handbook Addendum, *supra* note 48, at 35245.
303. *Id.* at 35252.
304. Cal. Fish & Game Code §2820(a)(2) (2014).
305. HCP Handbook Addendum, *supra* note 48, at 35242.
306. 50 C.F.R. §§17.22(b)(5), 17.32(b)(5), 222.307(g) (2014).
307. HCP Handbook Addendum, *supra* note 48, at 35242.
308. Thomas, *supra* note 5, at 149.
309. *See, e.g.*, Hood, *supra* note 6, at 5.
310. HCP Handbook Addendum, *supra* note 48, at 35242.
311. Camacho, *supra* note 14, at 332.
312. 50 C.F.R. §§17.22(b)(5), 17.32(b)(5), 222.307(g) (2014).
313. Hood, *supra* note 6, at 5.
314. *Id.*
315. Janet Franklin et al., *Planning, Implementing, and Monitoring Multiple-Species Habitat Conservation Plans*, 98 Am. J. Botany 559, 559 (2011).

effectiveness of adopted conservation measures, permittees can then adapt the HCP according to any changes discovered.[316] An effective adaptive management plan must also take into account ecological and biological knowledge and changing environmental conditions.[317] All of this information can be used in developing future HCPs.

1. Insufficient Attention to Monitoring and Enforcement

For a myriad of underlying reasons, there often has been insufficient attention and resources paid toward monitoring, implementation, and enforcement after an HCP is adopted.[318] A major criticism of the HCP program is its failure to systematically assess the efficacy of adopted conservation measures and the program more generally.[319] In some cases, it was a matter of not understanding or anticipating the needs of new program implementation—staffing requirements were not sufficiently appreciated or realized, there was inadequate funding,[320] and there were gaps in regulatory provisions, which, all together, made it impossible to adequately address unanticipated issues.[321] The San Bruno HCP did not implement any form of habitat monitoring, which might account for the plan's inability to restore native grassland and address the exotic species invasion that threatened the area.[322]

On the other hand, a number of HCPs have recognized the importance of monitoring and included robust monitoring plans. The San Diego MSCP, for example, contains a monitoring plan that includes monitoring certain target species, population fluctuations, "acreage of natural habitat, changes in habitat through disturbance like fire and flood, . . . changes in habitat quality over time, . . . [and] wildlife corridor usage."[323] Unfortunately, although the MSCP contained a more comprehensive monitoring plan than other HCPs in existence in the late 1990s, many still believed the plan was not sufficiently funded to be able to adequately conduct a monitoring plan.[324] Without robust monitoring and subsequent adjustment, HCPs are not likely to effectively manage uncertainty and changed circumstances.

The importance of robust monitoring has become more evident in recent years as genetic analyses are increasingly conducted on species populations.[325] Genetic analyses have shown that different populations of a single species can have genetic differences.[326] If one population of a species is lost, an entire genetic group may be lost.[327] Therefore, plans should no longer be based on the assumption that a single species can be managed in the same way across different populations, which increases the burden on monitoring to collect sufficient data to account for the possibility of genetic population differences.

2. Appropriately Targeted Monitoring Data Is Essential

For monitoring to inform whether an HCP's conservation measures are effective, the experience of the HCP program is that there must be monitoring of multiple species and habitat.[328] Early single-species-focused HCPs that implemented a monitoring plan, however, had a tendency to concentrate on "manipulation of individual animals instead of . . . managing habitat."[329] To best plan for various contingencies and changing circumstances, an HCP's monitoring plan must be sufficiently comprehensive to address "complex, community-level patterns and processes."[330]

HCPs need to appreciate the dynamic nature of the species and habitat included in such plans. Changed circumstances can be accounted for through monitoring, but not just monitoring of a species in isolation. An HCP's plan must incorporate monitoring of multiple species in the context of their "environmental drivers" of "occurrence and abundance"[331] to account for "environmental variability."[332]

3. Incentivizing Effective Adaptive Management

The Services have repeatedly acknowledged that adaptive management and contingency planning are valuable characteristics of HCPs.[333] According to the Services, adaptive management provisions in an HCP benefit habitat conservation and species preservation by providing a mechanism to account for unpredicted consequences of development or the availability of new information during the life of the HCP.[334] Adaptive management by definition includes monitoring, so it is not surprising that HCPs that include adaptive management provisions are much more likely to have clear monitoring plans.[335] However, there is limited funding[336] and lack of incentives for applicants and Services staff to engage in monitoring,[337] despite the fact that it is mandated under the HCP program.[338]

316. *See* Camacho, *supra* note 14, at 324.
317. Hood, *supra* note 6, at 26.
318. Callihan et al., *supra* note 43, at 43.
319. Camacho, *supra* note 14, at 340.
320. Telephone Interview with Jake Li, *supra* note 151.
321. Franklin et al., *supra* note 315.
322. Hood, *supra* note 6, at 30, 35-36.
323. *Id.* at 35.
324. *Id.*
325. Telephone Interview with Ron Rempel, *supra* note 172.
326. *See, e.g.*, John E. McCormack & James M. Maley, *Interpreting Negative Results With Taxonomic and Conservation Implications: Another Look at the Distinctness of Coastal California Gnatcatchers*, 132 The Auk: Ornithological Advances 380 (2015).
327. *See id.* at 382-84.
328. Hood, *supra* note 6, at 35.
329. *Id.* at 31.
330. Cameron W. Barrows et al., *A Framework for Monitoring Multiple-Species Conservation Plans*, 69 J. Wildlife Mgmt. 1333, 1335 (2005).
331. *Id.* at 1333.
332. Hood, *supra* note 6, at 27.
333. *See* HCP Handbook Addendum, *supra* note 48, at 35248.
334. Hood, *supra* note 6, at 26-27.
335. Kareiva et al., *supra* note 62, at 29.
336. Camacho, *supra* note 14, at 334.
337. *Id.* at 323-28.
338. 50 C.F.R. §§17.22(b)(3), 17.32(b)(3) (2014).

As a result, the vast majority of monitoring programs are inadequate and oversight of HCP compliance is usually deficient.[339] Additionally, subsequent HCP adaptation to integrate new data or respond to changed circumstances during plan implementation is even rarer.[340] Adaptive management is only mandated in a narrow set of circumstances,[341] and empirical evidence suggests that the Services and applicants often have limited capacity if not an aversion to implementing contingency planning or adaptive management.[342] There are unfortunately very few HCPs that incorporate contingency planning and adaptive management,[343] and even for those that do, there will always be a gap between true adaptive management and what agencies are actually capable of doing in the face of major resource and political constraints.[344]

Unfortunately, while the No Surprises policy provides an incentive for developers to participate in the HCP program, it simultaneously creates a strong disincentive for permittees to identify conditions as foreseeable, thus reducing the efficacy of contingency planning and adaptive management strategies.[345] Accordingly, some critics argued that the policy is "ecologically unsound," as it removes incentives to implement contingency planning and adaptive management measures.[346] Critics explain that the certainty the No Surprises policy provides reduces permittees' incentive to share information and resources, thus constricting adaptive management.[347] Changes presented by, for example, species population fluctuations, natural disasters, or new scientific information[348] pose a much greater risk of thwarting conservation efforts if an HCP has not contemplated redesign in the event of changed circumstances.[349]

Moreover, the federal government is expected to finance and implement any measures to address unforeseen circumstances. As has typically been the case, the federal government has very limited funds available to carry the financial burden of implementing adaptive management measures once unforeseen events occur.[350] According to interviews and dialogue participants, circumstances under which the federal government has stepped in to implement a strategy to manage an unforeseen circumstance are incredibly rare.

In order to provide sufficient assurances to encourage applicant participation without also encouraging developers to evade adaptive management responsibilities, the HCP program must include other strong incentives to engage in robust monitoring, contingency planning, and adaptive management.[351] There is broad recognition that a tension exists between the assurances of the No Surprises policy and the flexibility and redesign required by adaptive management.[352] However, the HCP program has yet to incorporate any affirmative measures for achieving a balance.

Various types of incentives have been recommended that can be utilized to encourage implementation of adaptive management even with the No Surprises policy in place. One proposed reform, similar to the assurances provisions in the NCCP Act,[353] is to tailor the "duration or rigor of the assurance to the quality or expected performance of the HCP's conservation strategy," which would be based on the "magnitude of the HCP's contribution to the target species' recovery."[354] The greater the net benefit of the HCP on conservation, the greater the duration or comprehensiveness of the assurance would be.[355] However, in practice, negotiating assurances in such a way is difficult due to political pressure and applicants' insistence on assurances for the total length of the permit.[356]

Another incentive recommended is the use of triggers,[357] which are "prenegotiated commitments in an adaptive-management plan that specify what actions are to be taken and when on the basis of information obtained from monitoring."[358] Areawide HCPs might also require applicants to furnish a bond in an amount that would cover the worst-case risk scenario; the bond would be reimbursed in portions whenever permittees "demonstrated that the worst-case damages were less than had been conservatively anticipated when the HCP was adopted."[359]

Other recommendations include providing direct federal loans, grants, or tax credits to permittees who engage in adaptive management.[360] However, all reforms recommended for increasing the implementation of adaptive management strategies will have to be weighed against the possibility that they may deter participation in the program more generally and the consequences that may bring.

4. Reducing Uncertainty With Advance Mitigation

Advance mitigation, as described above, is increasingly recognized as a means to proactively protect species and their habitats, while simultaneously implementing infra-

339. Callihan et al., *supra* note 43, at 43; Camacho, *supra* note 14, at 326.
340. Camacho, *supra* note 14, at 336-37.
341. HCP Handbook Addendum, *supra* note 48, at 35252.
342. Camacho, *supra* note 14, at 332-35.
343. *See* Wilhere, *supra* note 299, at 20.
344. E-mail from Dan Tarlock, Professor of Law, Dir., Ill. Inst. of Tech. Chi.-Kent Coll. of Law, Program in Envtl. & Energy Law, to author (Nov. 19, 2014, 09:44 PST).
345. *See, e.g.*, Camacho, *supra* note 14, at 355.
346. Thomas, *supra* note 5, at 149.
347. *Id.* at 167-68.
348. Hood, *supra* note 6, at 5.
349. *See* Thomas, *supra* note 5, at 149.
350. *See* Hood, *supra* note 6, at 5.
351. Camacho, *supra* note 14, at 355-56.
352. *See, e.g.*, Robert D. Thornton, *Habitat Conservation Plans: Frayed Safety Nets or Creative Partnerships?*, 16 Nat. Resources & Env't 94, 96 (2001).
353. Cal. Fish & Game Code §2820(f) (2014).
354. Gregory A. Thomas, *Where Property Rights and Biodiversity Converge Part III: Incorporating Adaptive Management and the Precautionary Principle Into HCP Design*, 18 Endangered Species Update 32, 39-41 (2001).
355. *Id.* at 41.
356. Telephone Interview with Ron Rempel, *supra* note 172.
357. Martin A. Nie & Courtney A. Schultz, *Decision-Making Triggers in Adaptive Management*, 26 Conservation Biology 1, 2-3 (2012); Telephone Interview with Jake Li, *supra* note 151.
358. Nie & Schultz, *supra* note 357, at 1, 5.
359. Camacho, *supra* note 14, at 356-57.
360. *Id.*

structure projects.[361] A significant advantage of advance mitigation is the ability to prove it is biologically effective before it is relied on as mitigation, due to the fact that on-the-ground effectiveness of a mitigation measure must be demonstrated before mitigation credit becomes available.[362] By requiring proof of effectiveness prior to approval, advance mitigation greatly decreases the likelihood that unforeseen circumstances will prevent the initial completion of mitigation, which reduces the likelihood that No Surprises assurances will need to be relied upon.[363] Accordingly, though unforeseen circumstances might subsequently reduce the efficacy of adopted strategies, the additional certainty that advance mitigation initially provides can help balance the disincentives the No Surprises policy creates with respect to managing for uncertainty and changed circumstances.[364]

D. Managing for Climate Uncertainty and Disruption

Managing for uncertainty and changed circumstances has become increasingly difficult but even more crucial in the face of existing and projected global climate change. The dialogues confirmed that one of the most significant but least-addressed substantive issues likely to shape the future of habitat conservation is how to manage long-term habitat conservation despite the potentially overwhelming effects of climate change on species migration and habitat fragmentation. In the Fifth Assessment Synthesis Report released in November 2014, the Intergovernmental Panel on Climate Change warned, "[w]ithout additional mitigation efforts beyond those in place today, and even with adaptation, warming by the end of the 21st century will lead to high to very high risk of severe, widespread, and irreversible impacts globally."[365]

1. The Ecological Effects of Climate Change

Climate change "threatens to move ecosystems outside their historic variability at an exceptionally fast rate," resulting in species extinctions or significant shifts in geographic distributions, "as the locations they currently occupy will become unsuitable for them."[366] Due to climate change in concert with other anthropogenic stressors (such as human-induced habitat loss, overexploitation, invasive species, and disease), substantial losses in species diversity are projected to occur if concerted assistance is not provided.[367] It is increasingly imperative that the HCP program and individual HCPs identify potential climate-related changes and develop specific management responses.[368]

Dialogue participants discussed how climate change places even greater weight on the development of effective adaptive management strategies, including providing sufficient resources and other incentives for relevant actors to select appropriate indicators and concrete triggers for action. The increased need for dynamic implementation in light of climate change reinforces the need for increased attention to both short-term and long-term funding, not only for habitat acquisition, but also adaptive plan management. Dialogue participants also discussed the need for a range of active adaptation strategies to facilitate species movement, including wildlife corridors[369] (particularly to reverse historic losses in connectivity), rolling easements,[370] connecting recovery plans to HCPs to help guide future development of plans, and assisted species migration.[371]

2. Limited Adaptive Capacity of Existing HCPs

For existing HCPs, the extent of projected ecological change raises extensive challenges to their successful implementation. A number of participants noted that most existing HCPs were not designed (and therefore do not seek) to account for climate change effects in their planning efforts, though some noted certain adaptation strategies (such as species transplantations and improving weather forecasting) that are currently being undertaken by some HCPs. Unfortunately, while some recent HCPs may mention climate change in the context of the importance of adaptive management, they do not "analyze[ ] the implications of climate change or develop[ ] specific linkages between climate-change scenarios and conservation actions."[372] Existing HCPs thus are likely premised on faulty projections, as well as subject to significantly more uncertainty about the potential type and magnitude of stressors on habitat designated for protection.

More fundamentally, most existing HCPs also assumed the capacity to maintain, by and large, the present ecological conditions in the designated plan area. To the extent that global climate change pushes conditions into the unforeseeable realm, the No Surprises policy places even greater pressure on the federal government to manage the HCP to account for such unforeseen circumstances—despite the uneasy track record in the HCP program of the Services having the resources to do so. The potentially serious consequences of not integrating climate change into adaptive management strategies are compounded by the fact that "typical management horizons for the larger plans [are] 30-50 years."[373]

361. DOI Secretarial Order No. 3330, *supra* note 51.
362. Telephone Interview with Jake Li, *supra* note 151.
363. *Id.*
364. *Id.*
365. Intergovernmental Panel on Climate Change, Climate Change 2014 Synthesis Report SYR-33 (2014).
366. Alejandro E. Camacho, *Assisted Migration: Redefining Nature and Natural Resource Law Under Climate Change*, 27 Yale J. on Reg. 171, 179-80 (2010).
367. *Id.*
368. Bernazzani et al., *supra* note 113, at 1111.
369. *Id.* at 1108.
370. *See, e.g.*, Jesse J. Richardson Jr., *Conservation Easements and Adaptive Management*, 3 Sea Grant L. & Pol'y J. 31, 50-53 (2010).
371. *See generally* Camacho, *supra* note 366.
372. Bernazzani et al., *supra* note 113, at 1105.
373. *Id.* at 1104.

3. Integrating Climate Change Into Future HCPs

The projected effects of climate change on species and habitat also likely call for fundamental changes in how future HCPs are designed.[374] Some dialogue participants involved in HCP implementation emphasized the need to extend permit plan periods to allow for a longer plan horizon. Agency participants, however, raised concerns about even longer term permits in the face of substantial ecological uncertainty.

A few dialogue participants suggested that future HCPs could better promote ecological health and resilient ecosystems by being formulated as ecosystem resilience plans that would focus on maintaining the plan area's functional diversity rather than attempting to maintain preexisting historical conditions or specific species. However, many dialogue participants and interviewees raised significant impediments in comprehensively addressing climate change through the HCP program as currently designed and funded. For existing HCPs, assurances to permittees and limited governmental resources to address change and unforeseen circumstances limit the implementation of climate change adaptation strategies. Even for future HCPs, under the existing ESA there are significant questions regarding the ability to project and integrate into plans the effects of wide-scale shifts in climate on ecological conditions.

4. Reformulating the HCP Program

A changing climate might ultimately require a fundamental reconsideration of the focus and goals of the HCP program.[375] Prevailing approaches to habitat conservation, including the HCP program, have fundamentally been premised on passive management and the reservation of land to promote and/or restore preexisting resources. Climate change will raise significant challenges to the prevailing place-based approach to habitat conservation planning. In particular, as climatic conditions shift, some of the resources initially deemed worthwhile of significant protection may no longer be compatible with the new conditions, while others may be more compatible.[376] It remains unclear how resource managers will be able to reconcile place-based goals focused on native ecosystem preservation with species-specific goals of endangered species preservation when these various pieces may be incompatible in light of changing climatic conditions.[377] Moreover, each of these foci for conservation may increasingly be incompatible with goals of promoting ecological vitality and function.

The HCP program, and habitat conservation more generally, may need to evolve to manage not only increased ecological stress, but also these increasing stressors on the governance process. Virtually all participants in the dialogues recognized the need for landscape-level planning to address climate change. Dialogue participants observed that relying on larger plans and providing for a variety of habitats is necessary to anticipate future habitat shifts. Some dialogue participants, however, questioned whether the HCP program as currently constituted, with its focus on mitigating development impacts rather than the effects of other broad-scale changes, is the appropriate mechanism for meaningfully addressing climate change. To these participants, climate change must be addressed through broader, more comprehensive planning efforts than even large-scale regional HCPs.

5. Nascent Adaptation Planning in Other Habitat Conservation Programs

Outside the HCP program, there have been a number of efforts to explore and begin to manage the climate change effects on conservation lands. At the federal level, the primary initiative for considering and eventually managing the effects of climate change on habitat has been the interjurisdictional coordination of information gathering through Landscape Conservation Cooperatives, established by DOI in 2010.[378] In addition, the National Climate Adaptation Strategy,[379] co-developed by FWS and the Council on Environmental Quality in response to a congressional directive, aims to "conserve habitat to support healthy fish, wildlife, and plant populations and ecosystem functions in a changing climate," recognizing that "sustaining a diversity of healthy populations over time requires conserving a sufficient variety and amount of habitat and building a well-connected network of conservation areas to allow the movement of species in response to climate change."[380]

On the state level, in 2009 California created the California Climate Change Adaptation Strategy that seeks to safeguard wildlife through a proactive, adaptive, and collaborative approach to climate change.[381] One strategy proposed is the creation of a network of preserves across the state that would allow biota free movement among the reserve areas in order to adjust to climate change.[382] The report acknowledged a number of significant steps before such a system of priority reserve areas was possible, including the required conservation of a significant amount of private lands, updating of the NCCP program and state Wildlife Action Plan, significant collaboration and coordination among state regulatory programs to ensure that all of

374. Elisa Barbour & Lara M. Kueppers, *Conservation and Management of Ecological Systems in a Changing California*, 111 Climatic Change 135, 156 (2012).
375. Camacho, *supra* note 148, at 7.
376. Camacho, *supra* note 366, at 179-80.
377. Barbour & Kueppers, *supra* note 374, at 155.
378. Landscape Conservation Cooperatives, *About the LCC Network*, http://www.lccnetwork.org (last visited Nov. 3, 2015).
379. U.S. Fish & Wildlife Serv. & Nat'l Oceanic & Atmospheric Admin., National Fish, Wildlife and Plants Climate Adaptation Strategy (2012), *available at* http://www.wildlifeadaptationstrategy.gov/pdf/NFWPCAS-Final.pdf.
380. *Id.*
381. Natural Res. Agency, 2009 California Climate Adaptation Strategy, *available at* http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf.
382. *Id.* at 57.

the adaptation plans are complementary, and modification of federal laws that limit federal agency land acquisition.[383]

However, these federal and state adaptation planning efforts remain nascent. Concrete adopted strategies for managing the effects of climate change on ecological resources and habitat conservation are quite rare, with most existing measures focusing on vulnerability assessment, information sharing, and broad programmatic declarations. Tellingly, the HCP program and existing HCPs have not been integrated into these federal and state climate initiatives. In particular, though FWS took a significant step in adopting a National Fish, Wildlife, and Plants Climate Adaptation Strategy that seeks to promote consideration of climate change effects in FWS efforts, incorporation and management of the effects of climate change in implementation of the ESA and habitat conservation planning remains inchoate.

Only relatively recently have federal endangered species listing decisions[384] even considered climate change effects, and conservation measures for managing these effects have been very limited.[385] Dialogue participants overwhelmingly agreed that a better and well-resourced infrastructure is needed for data pertinent to habitat conservation, and that the HCP program must be much more fully coordinated with existing climate change initiatives.

VI. Conclusion

Particularly in light of the projected convulsive effects of climate change on ecological resources, the need for broad-scale, interjurisdictional, adaptive planning is only increasing. Areawide multiagency HCPs, and the HCP program more generally, have offered valuable lessons that can help improve existing HCPs and provide direction for future HCP planning efforts. In consultation with dialogue participants and other experienced practitioners involved in habitat conservation planning, CLEANR identified scale, focus, and duration; interjurisdictional problem solving; funding; and managing uncertainty and change as the four topics of particular value as learning tools from the areawide multiagency HCP experience.

Yet these topics, and the lessons provided for each, are undoubtedly interrelated. As the scale of planning widens, the scope deepens, and the duration lengthens, the uncertainties, funding challenges, and difficulties of interjurisdictional problem solving accelerate. As some of the first experiments in large-scale, ecosystem-based, intergovernmental, and adaptive conservation planning, areawide multiagency HCPs illustrate the inherent conflict in comprehensive habitat conservation planning and governance. Particularly in light of the limited and unreliable amounts of funding provided for habitat conservation planning, these tensions have resulted in clear trade offs in scale, depth, duration, cost, certainty, and efficacy.

However, close attention to these underlying trade offs—along with recognition of when appropriate conditions exist and careful institutional design choices—can maximize the likelihood of effective, multijurisdictional, large-scale, and adaptive conservation planning. To help develop effective interjurisdictional problem solving, authorities must foster a clear and streamlined interagency framework that relies on an initial scoping process, promotes open participation and information sharing, assists participants with resources and training, and adopts an early regional mitigation needs assessment. It is essential to institute robust but targeted monitoring and incentivize institutional actors to adapt management strategies to account for new information and changes in circumstances. Finally, given the uncertainty that inherently characterizes conservation of dynamic species and habitat, advance mitigation mechanisms and statewide funding are increasingly recognized as invaluable for promoting stable funding for broad-scale interjurisdictional conservation.

383. *Id.* at 57-59.

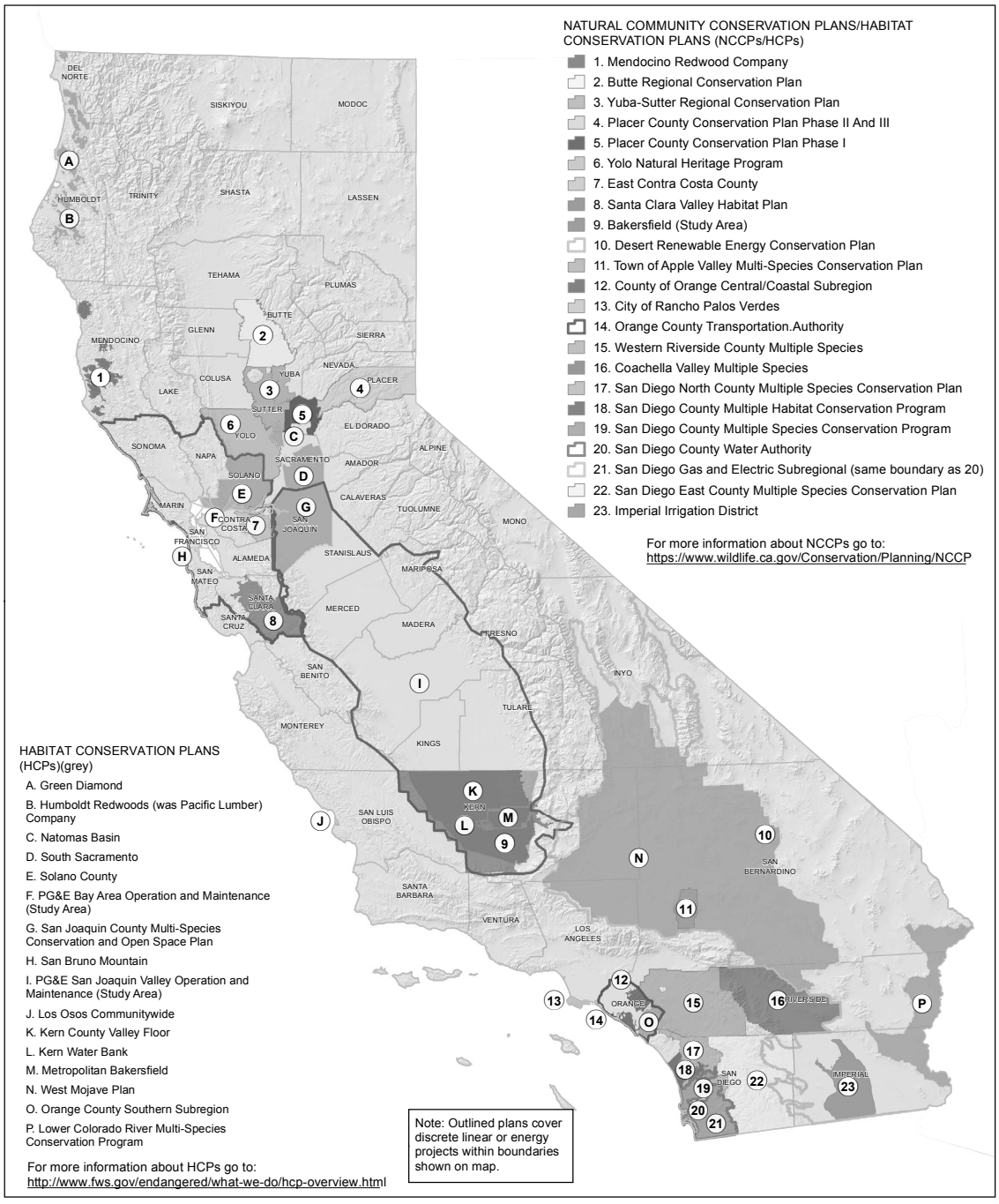
384. 16 U.S.C. §1533(a)(1) (2014).

385. The first such listing was the polar bear in 2008, with FWS stating that the Arctic sea ice used as habitat by the polar bear would continue to be affected by climate change. 50 C.F.R. §17.11 (2015) (listing the polar bear as threatened).

Appendix

CALIFORNIA REGIONAL CONSERVATION PLANS

August 2015



NCCP: Natural Community Conservation Plan (California Fish and Game Code §2800)
HCP: Habitat Conservation Plan (Federal Endangered Species Act Section 10)

CALIFORNIA DEPARTMENT OF FISH & WILDLIFE

(1) HCP/NCCP - Planning Stage
(1) HCP/NCCP - Implementation Stage
(A) HCP - Planning Stage
(A) HCP - Implementation Stage

Conservation plans may be in various stages of review, and subject to change. In some cases, boundaries have not been submitted by participants, and are **estimated locations**.

Data Sources: Conservation Planning Areas: California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Bureau of Land Management, Mendocino Redwood Company, San Diego Association of Governments, and Coachella Valley Association of Governments, CALFED Bay Delta Program, City of Bakersfield.

Projection: Teale Albers, units in meters, NAD83. D.Mastalir 20150821