

## AGRICULTURE AT A CROSSROADS: ENERGY BIOMASS STANDARDS AND A NEW SUSTAINABILITY PARADIGM?

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*Bioenergy policy through the past decade has increasingly emphasized combustion and conversion of biomass as a means to combat greenhouse gas emissions, ease dependence on foreign energy sources, and create jobs in rural areas. As demand for biomass increases due to laws such as the Energy Independence and Security Act and the Biomass Crop Assistance Program, questions have arisen as to how “green” biomass cropping really can be if production merely follows an agricultural status quo that has arguably led to environmental problems such as Gulf hypoxia, widespread monocultures with little species diversity, and decreased water quality and quantity. Further, if new biomass cropping replaces food production on the same number of acres, food security issues arise due to increases in commodity prices. If expanded to new lands, native habitats may be destroyed. To address these concerns, many sustainability standards recently have emerged, or likely will issue in the near future. For example, the U.S. Department of Agriculture has issued regulations that require conservation planning in order to receive a BCAP subsidy. California is in the process of developing sustainability standards for biomass used in transportation fuels as well as the generation of electricity. The Council for Sustainable Biomass Production has issued a provisional voluntary standard for the U.S. market. And the Environmental Protection Agency must report to Congress in 2010 on the environmental ramifications of the renewable fuels mandate.*

*In addition to achieving consistency among biomass sustainability standards, a main challenge moving forward is ensuring credibility and ease of implementation. Existing agricultural conservation programs in the United States contain planning and assessment proto-*

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*cols, practice-based modeling, and program evaluation procedures that can greatly inform efforts to consistently define “renewability” in biomass-specific mandates and subsidy programs. Government agencies, the scientific community, and stakeholders in the process must, however, strengthen their collaborative efforts so that biomass’s potential to significantly improve the agro-environmental landscape through standards is better understood. Most significantly, a rethinking of existing agricultural conservation programs in the energy biomass context has the real potential to create an entirely new sustainability paradigm for the entire agricultural sector.*

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*[S]tewardship is about being responsible. It is about changing attitudes, forging local shared visions of the desired state for private and public natural resources, and facilitating the actions needed to realize the desired future condition. Institutionally, stewardship is about assisting land users to care for the resources.*

—National Resources Conservation Service National Planning Procedures Handbook<sup>1</sup>

## I. INTRODUCTION

Opposition to biomass's<sup>2</sup> label as “sustainable” or “renewable” is generally three-fold.<sup>3</sup> The criticism that has received the most attention from policymakers and the press by far has been the indirect land use change implications of energy biomass demand (i.e., increased carbon emissions resulting from deforestation for cropland).<sup>4</sup> A close second is the claim by scientists, nongovernmental organizations, and the food industry, among others, that the amount of energy biomass feedstocks need to satisfy bioenergy mandates will result in competition for acreage with food production, thus leading to higher food prices and even food shortages for the world's poorest people.<sup>5</sup> Therefore, from a socio-economic sustainability point of view, energy biomass production is ethically unacceptable. The third factor—and central focus of this Article—is that without some type of field-level sustainability standards, energy biomass grown under industrialized conditions, heavily dependent on fossil fuel inputs and irrigation, merely solidifies an unsustainable status quo within commodity agriculture unbecoming of a “bio”-fuel, even if greenhouse gas (GHG) emissions are otherwise reduced.<sup>6</sup>

1. *Handbooks*, NATURAL RES. CONSERVATION SERV., tit. 180, pt. 600, subpt. D, § 600.46(e), <http://policy.nrcs.usda.gov/> (follow “Handbooks” hyperlink) (last visited Jan. 30, 2011).

2. Generally, “[t]he term biomass energy can refer to any source of heat energy produced from non-fossil biological materials,” ranging from “firewood to ethanol produced from corn or sugarcane to methane captured from landfills.” Christopher B. Field et al., *Biomass Energy: The Scale of the Potential Resource*, 23 *TRENDS ECOLOGY & EVOLUTION* 65, 65 (2008). Biomass currently constitutes approximately seven percent of the world's energy consumption. *Id.*

3. See David Tilman et al., *Beneficial Biofuels—The Food, Energy, and Environment Trilemma*, 325 *SCIENCE* 270 (2009).

4. For the seminal article in this regard, see Timothy Searchinger et al., *Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change*, 319 *SCIENCE* 1238 (2008).

5. See, e.g., Jacinto F. Fabiosa et al., *The Global Bioenergy Expansion: How Large Are the Food-Fuel Trade-Offs?*, in *HANDBOOK OF BIOENERGY ECONOMICS AND POLICY* 113 (Madhu Khanna et al. eds., 2010); C. Ford Runge & Benjamin Senauer, *How Biofuels Could Starve the Poor*, *FOREIGN AFF.*, May–June 2007, at 41; ACTIONAID UK, *MEALS PER GALLON: THE IMPACT OF INDUSTRIAL BIOFUELS ON PEOPLE AND GLOBAL HUNGER* (2010), [http://www.actionaid.org.uk/doc\\_lib/meals\\_per\\_gallon\\_final.pdf](http://www.actionaid.org.uk/doc_lib/meals_per_gallon_final.pdf); Bloomberg News, *Food-Related Industries Launch Anti-biofuel Campaign*, *HOUS. CHRON.* (June 10, 2008, 11:30 AM), <http://www.chron.com disp/story.mpl/headline/biz/5829126.html>.

6. Agriculture has historically remained exempt from environmental regulation, causing well-documented environmental problems in the landscape. See Mary Jane Angelo, *Corn, Carbon, and Conservation: Rethinking U.S. Agricultural Policy in a Changing Global Environment*, 17 *GEO. MASON L. REV.* 593, 613–21 (2010); Michael Jahi Chappell & Liliana A. LaValle, *Food Security and Biodiver-*

Acknowledging that the United States is not on a trajectory to meet ambitious renewable fuel blending requirements, the Obama administration announced on February 3, 2010, a new, integrated approach.<sup>7</sup> Conspicuous in the new strategy was an emphasis on conducting an “up-front” assessment of sustainability in biomass feedstock production systems.<sup>8</sup> This new approach presumably will address the Renewable Fuel Standard (RFS2) and the Biomass Crop Assistance Program (BCAP), which contain somewhat different definitions of “renewable biomass,” as well as the administration’s new GHG emission rules for mobile and stationary sources that likely will lead to increased consumption of biomass.<sup>9</sup> In addition to federal-level efforts, California is aggressively developing policies in both its transportation and electricity sectors that recognize that sustainability of feedstocks must be considered concurrently with GHG reduction measures.<sup>10</sup> In anticipation of compliance requirements, the Council on Sustainable Biomass Production (CSBP), a private stakeholder effort to develop biomass sustainability standards in the United States, has issued a provisional standard and is currently in the process of developing criteria and indicators through field testing.<sup>11</sup>

The challenge moving forward for policymakers and standard-setters will be to design sustainability regimes that affect positive change, while at the same time fostering timely development of the energy biomass sector. From a scientific perspective, important issues regarding the “renewability” or “sustainability” of energy biomass cropping practices remain outstanding.<sup>12</sup> Although scientific research continues to close

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sity: *Can We Have Both? An Agroecological Analysis*, AGRIC. & HUM. VALUES, 7 (Nov. 27, 2009), <http://dx.doi.org/10.1007/s10460-009-9251-4> (detailing the state of industrialized and alternative agriculture); Nicolai V. Kuminoff, *Public Policy Solutions to Environmental Externalities from Agriculture*, in *THE 2007 FARM BILL AND BEYOND* 115, 116–17, 119 (Bruce L. Gardner & Daniel A. Sumner eds., 2007), [http://aic.ucdavis.edu/research/farbill07/aeibriefs/20070516\\_Summary.pdf](http://aic.ucdavis.edu/research/farbill07/aeibriefs/20070516_Summary.pdf).

7. Heather Zichal, *Moving America’s Clean Energy Economy Forward: Boost for Biofuels, Clean Coal*, WHITE HOUSE BLOG (Feb. 3, 2010, 7:05 PM), <http://www.whitehouse.gov/blog/2010/02/03/moving-america-s-clean-energy-economy-forward-boost-biofuels-clean-coal>.

8. U.S. DEP’T OF AGRIC., *GROWING AMERICA’S FUEL: AN INNOVATION APPROACH TO ACHIEVING THE PRESIDENT’S BIOFUELS TARGET 2*, 7 (2010), [http://www.whitehouse.gov/sites/default/files/rss\\_viewer/growing\\_america\\_s\\_fuels.PDF](http://www.whitehouse.gov/sites/default/files/rss_viewer/growing_america_s_fuels.PDF).

9. Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514 (June 3, 2010) (to be codified at 40 C.F.R. pts. 51–52, 70–71); Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards, 75 Fed. Reg. 25,324 (May 7, 2010) (to be codified at 40 C.F.R. pts. 85–86, 600; 49 C.F.R. pts. 531, 533 536–38).

10. See, e.g., AIR RES. BD., CAL. ENVTL. PROT. AGENCY, 1 PROPOSED REGULATION TO IMPLEMENT THE LOW CARBON FUEL STANDARD—STAFF REPORT: INITIAL STATEMENT OF REASONS, at VII-31 (2009), [http://www.arb.ca.gov/fuels/lcfs/030409lcfs\\_isor\\_vol1.pdf](http://www.arb.ca.gov/fuels/lcfs/030409lcfs_isor_vol1.pdf).

11. COUNCIL ON SUSTAINABLE BIOMASS PROD., *DRAFT PROVISIONAL STANDARD FOR SUSTAINABLE PRODUCTION OF AGRICULTURAL BIOMASS* (2010), [http://www.csbp.org/files/survey/CSBP\\_Provisional\\_Standard.pdf](http://www.csbp.org/files/survey/CSBP_Provisional_Standard.pdf).

12. See VERONIKA DORNBURG ET AL., NETH. ENVTL. ASSESSMENT AGENCY, WAB 500102 012, *BIOMASS ASSESSMENT: ASSESSMENT OF GLOBAL BIOMASS POTENTIALS AND THEIR LINKS TO FOOD, WATER, BIODIVERSITY, ENERGY DEMAND AND ECONOMY* (2008), <http://www.rivm.nl/bibliotheek/rapporten/500102012.pdf>; see also Adrian Muller, *Sustainable Agriculture and the Production of Biomass for Energy Use*, 94 CLIMATIC CHANGE 319, 322 (2009) (“Other than land competition . . . [the] environmental sustainability of large-scale bioenergy production has not yet entered the broader discussion . . .” (footnote omitted)).

knowledge gaps, existing government agro-environmental programs may be the first logical choice for policymakers to look to for guidance. Indeed, the newly finalized BCAP regulation defines “renewability” as having a conservation plan in place that is approved by the U.S. Department of Agriculture’s (USDA) Commodity Credit Corporation (CCC).<sup>13</sup> USDA’s Natural Resources Conservation Service (NRCS), in cooperation with state and local conservation authorities, is mainly responsible for administering sustainability considerations embedded in other federal subsidy programs for both agricultural commodity production and land retirement, such as the Conservation Stewardship Program (CSP) and the Conservation Reserve Program (CRP).<sup>14</sup> Its experience, therefore, could be a platform on which to build biomass sustainability practice standards. On the flip-side, the emerging bioenergy economy and the process of defining what “renewable” energy really means has real potential to shift the sustainability paradigm within all of commodity agriculture through reconsideration of the overall effectiveness of policies and conservation practice standards like those of NRCS.

The goal of this Article is to examine existing U.S. agricultural conservation policies in light of emerging bioenergy policies and standards, and whether they can serve as a framework for establishing sustainable agronomic practices for energy biomass. Although energy biomass includes both agricultural cropland and forest material, this Article focuses on arguably the more underdeveloped agricultural sustainability practices for crop production and saves an analysis of forest energy biomass standards for another day.<sup>15</sup> Part II sets the stage by providing a brief overview of U.S. bioenergy legislation and its current and future sustainability requirements beyond GHG reduction, general sustainability principles, and the voluntary CSBP provisional sustainability standard for energy biomass. Part III examines in detail NRCS conservation planning processes, measurement tools, and recommended practices. Part IV takes a look at government agricultural sustainability programs that historically have been designed for commodity food production, but could be used as scoring tools to evaluate project proposals in the biomass feedstock context. Drawing on prior Sections, the Conclusion makes

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13. See *infra* Part II.A.2.

14. See 7 U.S.C. § 6962(b) (2006); NATURAL RES. CONSERVATION SERV., U.S. DEP’T OF AGRIC., NATIONAL AGRONOMY MANUAL § 500.00 (3d ed. 2002), <http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17894.wba>.

15. Although organic farming standards for food and livestock have been in operation for almost ten years, no comprehensive government or private sustainability regime for biomass cropping is yet in place in the U.S. Scientific Certification Systems (SCS). The Leonardo Academy is in the process of developing an American National Standards Institute (ANSI) standard for food crops, but it is unclear whether the standard will develop biomass-specific metrics. See *Sustainable Agriculture Standard*, LEONARDO ACAD., <http://www.leonardoacademy.org/programs/standards/agstandard.html> (last updated Sept. 13, 2010). On the other hand, private forest sustainability certification schemes have existed in the United States since 1992, including the Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI), American Tree Farm System (ATFS), and the Program for the Endorsement of Forest Certification (PEFC). See COUNCIL ON SUSTAINABLE BIOMASS PROD., *supra* note 11, at 7.

policy design recommendations moving forward to achieve optimal sustainability, while at the same time avoiding costly and time-consuming duplication that could hinder progress toward a biomass-based energy future.

## II. THE EVOLUTION OF BIOMASS SUSTAINABILITY REQUIREMENTS

The term “renewable energy,” in its most basic form, means energy that is “continually available to some degree or other all over the world.”<sup>16</sup> Like the sun that shines, the wind that blows, or rivers that flow, plants can regenerate and are thus arguably “renewable.” But also like solar panels that use water, wind turbines that kill bats, or dams that impede salmon, energy biomass has its own set of environmental trade-offs. Conventional agricultural practices maintain soil nutrients and achieve ever-increasing yields through fossil fuel inputs, genetically modified (GM) plants, and vast stretches of monocultures that contribute to, or have an unknown potential to cause, environmental degradation.<sup>17</sup> Further, weeds and insects are suppressed through pesticides and herbicides. Some question whether such a system truly is “sustainable.”

The ultimate definition of what a sustainable agricultural system should look like varies.<sup>18</sup> One of the most commonly cited definitions of sustainability is to “supply a growing population with [*X* commodity, be it food or energy] without destroying the environment within which it is [derived and] used, providing [said commodity] for the present without compromising the ability of future generations to meet their needs.”<sup>19</sup> Others are more human-centric, defining agricultural “sustainability” as “an agriculture that can evolve indefinitely toward greater human utility, greater efficiency of resource use, and a balance with the environment that is favorable both to humans and to most other species.”<sup>20</sup> Standards also are increasingly extending the meaning of “sustainability” to include

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16. *What Is Renewable Energy?*, AM. COUNCIL RENEWABLE ENERGY, [http://www.acore.org/what\\_is\\_renewable\\_energy](http://www.acore.org/what_is_renewable_energy) (last visited Jan. 30, 2011).

17. LONI KEMP & JULIE M. SIBBING, NAT'L WILDLIFE FED'N, *GROWING A GREEN ENERGY FUTURE: A PRIMER AND VISION FOR SUSTAINABLE BIOMASS ENERGY* 2, 21 (2010), <http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Global-Warming/2010/~media/PDFs/Global%20Warming/Reports/Growing-a-green-energy-future.ashx>.

18. See generally Xun Jin & Karen A. High, *A New Conceptual Hierarchy for Identifying Environmental Sustainability Metrics*, 23 ENVTL. PROGRESS 291, 292 (2004) (concluding that despite “[a] vast diversity in defining sustainability . . . during the later half of the past century . . . [v]arious explanations [of the meaning of sustainability] can be essentially sorted into three classes of views”: inter-/intra-generation equity, the critical limits view, and the competing objectives view).

19. John A. Turner, *A Realizable Renewable Energy Future*, 285 SCIENCE 687, 687 (1999) (citing WORLD COMM'N ON ENV'T & DEV., *OUR COMMON FUTURE* (1987)).

20. Richard R. Harwood, *A History of Sustainable Agriculture*, in SUSTAINABLE AGRICULTURAL SYSTEMS 3, 4 (Clive A. Edwards et al. eds., 1990) (detailing the historical evolution of the concept of sustainability in agriculture).

sustainable social practices such as fair labor standards and benefits to the greater community such as education and health care.<sup>21</sup>

How to achieve this sustainability in agriculture “remains elusive.”<sup>22</sup> Within the abundant scientific scholarship addressing the nexus generally between agricultural production and environmental quality, conflicting views emerge on future courses of action. Some scholarship suggests that a range of “alternative” agricultural practices (e.g., closed-loop plant nutrient systems, no-till/conservation agriculture, integrated pest management) can provide enough food globally, increase profits for small farmers, and achieve a higher level of environmental quality.<sup>23</sup> Others conclude that widespread adoption of alternative practices increases costs and decreases yield, and advocate instead for yield increases through genetic modification that would allow for biomass and food production on the same or less number of acres.<sup>24</sup> Opponents counter that increasing yields per acre through GM crops may actually lead to more deforestation “due to the fundamental economic pressure to take advantage of successful high-yielding practices,” particularly if population growth sustains demand for food.<sup>25</sup> Instead, they contend that systems that increase productivity per acre but require more labor, avoid deforestation for biomass cropping (and thus increased GHG emissions), save more land for biodiversity, increase rural employment, and provide food security worldwide from the same number of acres.<sup>26</sup>

As consensus grows that climate change and reliance on imported fuels pose significant environmental and energy security risks for the United States, so will inertia toward renewable energy substitutes including biomass-based fuels. At the same time, consumer sentiment has grown toward a “closer connection between people and the food they eat,” a connection that admittedly has become lost as agriculture industrialized over the past fifty years.<sup>27</sup> This stems from the belief that economies of scale in the food production sector in the United States have provided uniformity and lower-cost agricultural raw materials, but not

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21. Although important, the Article’s focus will be limited to the environmental sustainability of biomass’ *agronomic* practices.

22. D. Rigby & D. Cáceres, *Organic Farming and the Sustainability of Agricultural Systems*, 68 *AGRIC. SYS.* 21, 21 (2001); see also Michelle Wander, *Agroecosystem Integrity and the Internal Cycling of Nutrients*, in *SUSTAINABLE AGROECOSYSTEM MANAGEMENT: INTEGRATING ECOLOGY, ECONOMICS, AND SOCIETY* 137, 159 (Patrick J. Bohlen & Gar House eds., 2009) (“Pressures on the land and growing acceptance of resource limits are rekindling interest in [plant productivity and nutrient use efficiency].”).

23. Chappell & LaValle, *supra* note 6, at 9, 12.

24. See Muller, *supra* note 12, at 321 n.3 (noting that “[t]here is an ongoing debate on yields in sustainable agriculture” and providing a literature review on both sides of the issue).

25. Chappell & LaValle, *supra* note 6, at 5.

26. *Id.* Chappell & LaValle suggest that food insecurity is “a matter not of total availability but indeed one of access, political power, and equity.” *Id.* at 6.

27. See Susan A. Schneider, *Reconnecting Consumers and Producers: On the Path Toward a Sustainable Food and Agriculture Policy*, 14 *DRAKE J. AGRIC. L.* 75, 76 (2009) (citing Neil Hamilton, *Food Democracy and the Future of American Values*, 9 *DRAKE J. AGRIC. L.* 9 (2004)).

without costs to rural society,<sup>28</sup> human health, food security,<sup>29</sup> and the natural environment. In light of these consumer trends, society must now grapple with the meaning of “renewable” fuel. Thus far, it has primarily been based on energy security, rural development, and perhaps reduction of GHGs, while maintaining the status quo of industrialized agricultural production practices. Increasing environmental awareness as well as the human need for both food and energy, however, may necessitate a more holistic, multi-functional system—a sustainable system—for all agricultural production.<sup>30</sup>

A. *The Definition of “Renewable Biomass” in U.S. Bioenergy Policies*

Historically, U.S. biofuels policy has relied primarily on corn as an ethanol feedstock. Although corn ethanol has served as an engine for rural development, the environmental implications of conventional corn production<sup>31</sup> were largely unaddressed in government energy policy until the enactment of the Energy Independence and Security Act of 2007 (EISA).<sup>32</sup> In order to satisfy the mandatory blending levels of “renewable fuels” into transportation fuels, all biofuels qualifying for EISA’s RFS2 must for the first time achieve a certain level of GHG reductions and be derived from “renewable biomass.”<sup>33</sup> In addition, the 2008 Farm Bill established the first supply-side incentive for renewable biomass through creation of BCAP.<sup>34</sup> Final implementing regulations for BCAP condition payments on whether the biomass was produced under a con-

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28. Janel M. Curry, *Care Theory and “Caring” Systems of Agriculture*, 19 AGRIC. & HUM. VALUES 119, 122 (2002) (noting that today’s status quo, stemming from structural changes in U.S. agriculture over the past one hundred years, has emphasized individual farm profitability and left out entirely the connection of the individual farming operation to the community and nature).

29. See, e.g., A. Bryan Endres & Jody M. Endres, *Homeland Security Planning: What Victory Gardens and Fidel Castro Can Teach Us in Preparing for Food Crises in the United States*, 64 FOOD & DRUG L.J. 405 (2009).

30. One scholar asserts that there currently is no “forum for a consideration of ethical issues regarding food” and suggests a more holistic approach in the future. Susan A. Schneider, *A Reconsideration of Agricultural Law: A Call for the Law of Food, Farming, and Sustainability*, 34 WM. & MARY ENVTL. L. & POL’Y REV. 935, 959 (2010); see also Daniel Hillel & Cynthia Rosenzweig, *The Role of Biodiversity in Agronomy*, 88 ADVANCES AGRONOMY 1, 27 (2005) (“A more holistic approach to the integration of farming and ecology will better promote nutrient recycling, biological pest and disease control, pollination, soil quality maintenance, water-use efficiency, and carbon sequestration . . .”).

31. A primary concern is nitrogen loading in the Mississippi River System, which scientists claim causes ecological dead zones in the Gulf of Mexico. See generally Christine Costello et al., *Impact of Biofuel Crop Production on the Formation of Hypoxia in the Gulf of Mexico*, 43 ENVTL. SCI. & TECH. 7985 (2009); Simon D. Donner & Christopher J. Kucharik, *Corn-Based Ethanol Production Compromises Goal of Reducing Nitrogen Export by the Mississippi River*, 105 PROC. NAT’L ACAD. SCI. U.S. AM. 4513 (2008); VIRGINIA H. DALE ET AL., ECOLOGICAL SOC’Y AM., BIOFUELS: IMPLICATIONS FOR LAND USE AND BIODIVERSITY 9 (Jan. 2010), [http://www.esa.org/biofuelsreports/files/ESA%20Biofuels%20Report\\_VH%20Dale%20et%20al.pdf](http://www.esa.org/biofuelsreports/files/ESA%20Biofuels%20Report_VH%20Dale%20et%20al.pdf) (stating that local farm choices with regard to fertilizer use have “broad implications,” including dead zones in the Gulf of Mexico).

32. Energy Independence and Security Act of 2007, Pub. L. No. 110-140, 121 Stat. 1492.

33. *Id.* § 201, at 1519–21 (codified at 42 U.S.C. § 7545(o) (Supp. II 2009)).

34. Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 9001, § 9011, 122 Stat. 1651, 2089–93 (codified at 7 U.S.C. § 8111 (Supp. III 2010)).

ervation plan.<sup>35</sup> At the state level, California is in the process of developing biomass sustainability standards to accompany its broader GHG reduction agenda embedded in programs such as the Low Carbon Fuel Standard (LCFS).<sup>36</sup>

### 1. *The Renewable Fuel Standard (RFS2)*

EISA mandates increasing amounts of cellulosic biofuels, biomass-based diesel, advanced biofuels, and “renewable” fuels in the fuel supply through 2022.<sup>37</sup> In addition to mandatory GHG emission thresholds for each category of fuel,<sup>38</sup> obligated parties under RFS2 must source renewable fuels from “renewable biomass.”<sup>39</sup> “Renewability” in the statute focuses on land conversion prohibitions,<sup>40</sup> limits on biomass sourcing from nonfederal forests, and absolute bars against harvests from old growth or late succession forests and forests with ecological communities with a certain global or state ranking.<sup>41</sup> No equivalent conservation provisions apply to agricultural lands, except for the conservation prohibitions. In March 2010, the U.S. Environmental Protection Agency (EPA) finalized

35. Biomass Crop Assistance Program, 75 Fed. Reg. 66,202, 66,240 (Oct. 27, 2010) (to be codified at 7 C.F.R. § 1450.105(a)(1)) (obligating program participants to “[c]arry out and certify compliance with the terms and conditions of the payment application including adherence to a conservation plan, forest stewardship plan, or equivalent plan, as appropriate”).

36. See, e.g., AIR RES. BD., *supra* note 10, at VII-31 to VII-32.

37. Energy Independence and Security Act § 202(a)(2), 121 Stat. at 1522–24 (codified at 42 U.S.C. § 7545(o)(2)(B) (Supp. II 2009)).

38. *Id.* § 201, at 1519–21 (codified at 42 U.S.C. § 7545(o)(1)(B), (D), (E), (J)).

39. *Id.* at 1520–21 (codified at 42 U.S.C. § 7545(o)(1)(I)). Renewable biomass includes:

- (i) Planted crops and crop residue harvested from agricultural land cleared or cultivated at any time prior to the enactment of this sentence that is either actively managed or fallow, and nonforested.
- (ii) Planted trees and tree residue from actively managed tree plantations on non-federal land cleared at any time prior to enactment of this sentence, including land belonging to an Indian tribe or an Indian individual, that is held in trust by the United States or subject to a restriction against alienation imposed by the United States.
- (ii) Animal waste material and animal byproducts.
- (iv) Slash and pre-commercial thinnings that are from non-federal forestlands, including forestlands belonging to an Indian tribe or an Indian individual, that are held in trust by the United States or subject to a restriction against alienation imposed by the United States, but not forests or forestlands that are ecological communities with a global or State ranking of critically imperiled, imperiled, or rare pursuant to a State Natural Heritage Program, old growth forest, or late successional forest.
- (v) Biomass obtained from the immediate vicinity of buildings and other areas regularly occupied by people, or of public infrastructure, at risk from wildfire.
- (vi) Algae.
- (vii) Separated yard waste or food waste, including recycled cooking and trap grease.

*Id.*

40. *Id.* at 1521 (codified at 42 U.S.C. § 7545(o)(1)(I)(i)).

41. *Id.* (codified at 42 U.S.C. § 7545(o)(1)(I)(iv)).

implementing regulations for EISA.<sup>42</sup> EPA is taking an “aggregate compliance approach” to enforcing the land use provisions.<sup>43</sup> That is, producers will not be required to retain any records of compliance unless the “2007 Baseline” amount of agricultural land has been exceeded.<sup>44</sup> If exceeded, the domestic obligated party can show evidence of compliance by participation in a farm program or a written management plan.<sup>45</sup>

The environmental effects of biomass cropping beyond just land use change are at least on Congress’ radar, however. The EPA Administrator, in consultation with the Secretary of Energy, must

assess and report to Congress on the . . . [current and future] impacts of [the RFS] on . . . :

- (1) Environmental issues, including air quality, effects on hypoxia, pesticides, sediment, nutrient and pathogen levels in waters, acreage and function of waters, and soil environmental quality.
- (2) Resource conservation issues, including soil conservation, water availability, and ecosystem health and biodiversity, including impacts on forests, grasslands, and wetlands.
- (3) The growth and use of cultivated invasive or noxious plants and their impacts on the environment and agriculture.<sup>46</sup>

The first assessment is due in 2010 and then every three years thereafter.<sup>47</sup> With the exception of corn and corn stover, which data for cellulosic biomass that EPA and the Department of Energy (DOE) will base their assessment on is unclear, as so few commercial acres currently are in production.

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42. Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program, 75 Fed. Reg. 14,670 (Mar. 26, 2010) (to be codified at 40 C.F.R. pt. 80).

43. *Id.* at 14,888–92 (to be codified at 40 C.F.R. § 80.1454). Foreign producers must show compliance through a third-party compliance survey. *Id.* at 14,890 (to be codified at 40 C.F.R. § 80.1454(h)).

44. *Id.* (to be codified at 40 C.F.R. § 80.1451(g)). The 2007 baseline is 402 million acres. *Id.* at 14,701. USDA makes long-run projections of the U.S. agricultural sector, including for land that is planted, harvested, and idled. OFFICE OF THE CHIEF ECONOMIST, U.S. DEP’T OF AGRIC., OCE-2010-1, USDA AGRICULTURAL PROJECTIONS TO 2019 (2010), [http://www.usda.gov/oce/commodity/archive\\_projections/USDAgriculturalProjections2019.pdf](http://www.usda.gov/oce/commodity/archive_projections/USDAgriculturalProjections2019.pdf). The tables can also be found at *USDA Long-Term Agricultural Projection Tables*, U.S. DEP’T OF AGRIC., <http://usda.mannlib.cornell.edu/MannUsda/viewStaticPage.do?url=http://usda.mannlib.cornell.edu/usda/ers/94005/.2010/index.html> (last visited Jan. 30, 2011).

45. Regulation of Fuels and Fuel Additives, 75 Fed. Reg. at 14,890 (to be codified at 40 C.F.R. § 80.1454(g)(2)). Presumably, the forest management plan would address compliance with the ecological communities provision.

46. Energy Independence and Security Act § 204(a)(1)–(3), 121 Stat. at 1529 (codified at 42 U.S.C. § 7545(a)(1)–(3)).

47. *Id.* § 204(a), at 1529 (codified at 42 U.S.C. § 7545(a)).

## 2. *The Biomass Crop Assistance Program (BCAP)*

The 2008 Farm Bill established BCAP as the first energy biomass cropping subsidy program in the United States.<sup>48</sup> USDA's CCC proposed implementing regulations in February 2010 and issued a Final Rule on October 27, 2010.<sup>49</sup> The first part of the program, which CCC implemented without rulemaking from mid-June 2009 through early-February 2010,<sup>50</sup> provides a matching payment for "eligible material" collection, harvest, storage, and transportation (CHST) to a qualified biomass conversion facility for production of heat, power, fuel, biobased products, or advanced biofuels.<sup>51</sup> The establishment payments and annual payments component of BCAP<sup>52</sup> will pay a portion of the cost for biomass producers to establish "eligible crops," which include perennial non-woody and woody crops in BCAP project areas.<sup>53</sup> CCC is required to evaluate a given project area application based, in part, on its "impact on soil, water, and related resources."<sup>54</sup>

BCAP payments only can issue for "renewable biomass,"<sup>55</sup> which has two basic meanings under the statute and regulations, and which underlie the definitions of "eligible crop" and "eligible material." First are land use restrictions that include a prohibition against cropping on lands with native vegetation not previously tilled for an annual crop as of the date the 2008 Farm Bill was enacted or on land that receives conservation, wetland, or grassland reserve payments.<sup>56</sup> In addition, renewable biomass does not include Title I crops so as not to incentivize energy production from food crops.<sup>57</sup> Unlike RFS2, BCAP requires sustainable

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48. Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 9001, § 9011, 122 Stat. 1651, 2089-93 (codified at 7 U.S.C. § 8111 (Supp. III 2010)).

49. Biomass Crop Assistance Program, 75 Fed. Reg. 66,202 (Oct. 27, 2010) (to be codified at 7 C.F.R. pt. 1450); Biomass Crop Assistance Program, 75 Fed. Reg. 6264 (proposed Feb. 8, 2010).

50. For a procedural history of BCAP, see generally Jody M. Endres et al., *The Biomass Crop Assistance Program: Orchestrating the Government's First Significant Step to Incentivize Biomass Production for Renewable Energy*, 40 ENVTL. L. REP. 10,066 (2010).

51. Biomass Crop Assistance Program, 75 Fed. Reg. at 66,238-40 (to be codified at 7 C.F.R. §§ 1450.100-106).

52. *Id.* at 66,240-43 (to be codified at 7 C.F.R. §§ 1450.200-215).

53. *Id.*

54. *Id.* at 66,240 (to be codified at 7 C.F.R. § 1450.202(a)(6)).

55. "Renewable biomass" under the Farm Bill generically includes plant material from private and Indian lands such as: feed grains, other agricultural commodities, other plants and trees, and algae; and wastes (crop residues, other vegetative wastes (excluding high-value uses), animal wastes, and food and yard wastes). *Id.* at 66,237 (to be codified at 7 C.F.R. § 1450.2(b)).

56. *Id.* at 66,236, 66,241 (to be codified at 7 C.F.R. §§ 1450.2(b), .204(b)(2)-(5)).

57. Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 9001, § 9011(a)(4), 122 Stat. 1651, 2089 (codified at 7 U.S.C. § 8111(a)(4) (Supp. III 2010)). Title I crops include the whole grains of barley, corn, grain sorghum, oats, rice, or wheat; honey; mohair; oilseeds such as canola, crambe, flaxseed, mustard seed, rapeseed, safflower seed, soybeans, sesame seed, and sunflower seeds; peanuts; pulse crops such as small chickpeas, lentils, and dry peas; dairy products; sugar; wool; and cotton boll fiber. *See* Biomass Crop Assistance Program, 75 Fed. Reg. at 66,235 (to be codified at 7 C.F.R. § 1450.2(b)). Establishment payments and annual payments preclude any plant deemed noxious or invasive by CCC. *Id.* (to be codified at 7 C.F.R. § 1450.2(b)) (defining "eligible crop" for purposes of establishment and annual payments). CHST payments are also not available for animal waste

agronomic and forestry practices for biomass.<sup>58</sup> For example, in order to qualify as “eligible material” for CHST payments, woody biomass must be “[b]yproducts of preventative treatments that are removed to reduce hazardous fuels, to reduce or contain disease or insect infestation, or to restore ecosystem health.”<sup>59</sup> Further, BCAP requires both CHST and Project Area participants to “implement and adhere to a conservation plan, forest stewardship plan, or equivalent plan prepared in accordance with BCAP guidelines, as established and determined by CCC,”<sup>60</sup> or follow an existing plan.<sup>61</sup> “Conservation plan” is defined in the Final Rule as:

a schedule and record of the participant’s decisions and supporting information for treatment of a unit of land or water, and includes a schedule of operations, activities, and estimated expenditures for eligible crops and the collection or harvesting of eligible material, as appropriate, and addresses natural resource concerns including the sustainable harvesting of biomass, when appropriate, by addressing the site-specific needs of the landowner.<sup>62</sup>

Program participants also must comply with highly erodible land (HEL) and wetland conservation requirements that apply generally in USDA subsidy programs and are addressed in conservation plans for those programs.<sup>63</sup> CCC resists, however, adding to BCAP erosion requirements beyond what is required for HEL—for example, to address erosion problems by watershed and not by the HEL classification of individual tracts.<sup>64</sup>

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and byproducts, food and yard waste, and algae. *Id.* at 66,236 (to be codified at 7 C.F.R. § 1450.2(b)) (defining “eligible material” for purposes of CHST payments).

58. One sustainability concern that is missing from BCAP is the value of biomass in reducing GHGs. BCAP does incentivize, however, the production of eligible crops that are to be converted to either cellulosic or advanced biofuels that are partially defined by their GHG-reducing potentials in RFS2. Biomass Crop Assistance Program, 75 Fed. Reg. at 66,242 (to be codified at 7 C.F.R. § 1450.214(f)(1)(i)–(ii)) (providing less stringent reductions in annual payments “if the eligible crop is delivered to a biomass conversion facility for conversion to cellulosic biofuels as defined by 40 CFR 80.1401 . . . [or] advanced biofuels”).

59. *Id.* at 66,239 (to be codified at 7 C.F.R. § 1450.103(a)(3)(i)). As an additional requirement for CHST payments, woody biomass must not “otherwise be used for higher-value products.” *Id.* (to be codified at 7 C.F.R. § 1450.103(b)(3)); *see also id.* at 66,236 (to be codified at 7 C.F.R. § 1450.2(b)) (defining “higher-value product” as “an existing market product that is comprised principally of an eligible material or materials and, in some distinct local regions, as determined by CCC, has an existing market as of October 27, 2010” and noting that “[h]igher-value products may include, but are not limited to, products such as mulch, fiberboard, nursery media, lumber, or paper”).

60. *Id.* at 66,237 (to be codified at 7 C.F.R. § 1450.3(b)).

61. *Id.* (to be codified at 7 C.F.R. § 1450.3(c)).

62. *Id.* at 66,235 (to be codified at 7 C.F.R. § 1450.2(b)). CCC requires that project area applicants also delineate conservation practices in the application. *Id.* at 66,209. The Final Rule states in the preamble that for project areas, the conservation plan is defined according to 7 C.F.R. § 1410.2, which is the CRP conservation plan part of the Rule. *Id.* at 66,210. “Forest Stewardship Plans” are also defined in the regulation, *id.* at 66,236 (to be codified at 7 C.F.R. § 1450.2(b)), but are not the focus of this Article.

63. *See infra* text accompanying note 119.

64. Biomass Crop Assistance Program, 75 Fed. Reg. 6264, 6265 (proposed Feb. 8, 2010).

### 3. *California's Multi-Faceted Greenhouse Gas (GHG) Regulatory Programs*

California's comprehensive GHG legislation, first enacted in 2006,<sup>65</sup> has generated many sector-specific regulations, including LCFS,<sup>66</sup> Renewable Electricity Standards,<sup>67</sup> mobile source emissions rules for light-duty vehicles,<sup>68</sup> and a proposed cap-and-trade regulation.<sup>69</sup> In the same year that the Global Warming Solutions Act was issued, the California Biomass Collaborative prepared a Biomass Roadmap for the California Energy Commission (CEC) that emphasized the need to develop a *sustainable* energy biomass supply.<sup>70</sup>

In addition to reductions in GHG emissions through increased use of biofuels and biomass in the transportation and electricity sectors, the California Air Resources Board (ARB) and the CEC (the agency with primary responsibility for implementing renewable portfolio standards) currently are in the process of developing concurrent practice-based sustainability standards for biomass feedstocks. ARB has indicated in recent LCFS rulemaking that it will issue draft sustainability metrics for biofuels feedstock by 2012.<sup>71</sup> ARB states that components of a sustainable system include, but are not limited to, “[w]ell defined sustainability criteria,” “indicators on a plantation level,” the assessment of the cumulative impacts of sustainability standards at the “regional or global level,” and certification.<sup>72</sup> ARB is working with all stakeholders in developing the standards<sup>73</sup> through a sustainability workgroup formed in mid-2010.<sup>74</sup>

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65. California Global Warming Solutions Act of 2006, CAL. HEALTH & SAFETY CODE §§ 38,500–38,599 (West Supp. 2010), [http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab\\_0001-0050/ab\\_32\\_bill\\_20060927\\_chaptered.pdf](http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf).

66. See CAL. CODE REGS. tit. 17, §§ 95,480–95,490, <http://www.arb.ca.gov/regact/2009/lcfs09/lcfscombofinal.pdf>; *Low Carbon Fuel Standard (LCFS)*, AIR RES. BD., CAL. ENVTL. PROT. AGENCY, <http://www.arb.ca.gov/regact/2009/lcfs09/lcfs09.htm> (last reviewed June 14, 2010).

67. See *Renewable Electricity Standard*, AIR RES. BD., CAL. ENVTL. PROT. AGENCY, <http://www.arb.ca.gov/energy/res/res.htm> (last reviewed Jan. 27, 2011).

68. CAL. CODE REGS. tit. 13, §§ 1961(d), 1961.1, <http://www.arb.ca.gov/regact/grnhsas/revfro.pdf>; *Clean Car Standards—Pavley, Assembly Bill 1493*, AIR RES. BD., CAL. ENVTL. PROT. AGENCY, <http://www.arb.ca.gov/cc/ccms/ccms.htm> (last reviewed Oct. 4, 2010); *Greenhouse Gas Emissions from Motor Vehicles*, AIR RES. BD., CAL. ENVTL. PROT. AGENCY, <http://www.arb.ca.gov/regact/grnhsas/grnhsas.htm> (last reviewed Apr. 28, 2008).

69. *Cap-and-Trade*, AIR RES. BD., CAL. ENVTL. PROT. AGENCY, <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm> (last reviewed Jan. 26, 2011).

70. CAL. ENERGY COMM'N, CEC-500-2006-095-D, A ROADMAP FOR THE DEVELOPMENT OF BIOMASS IN CALIFORNIA 47–58 (2006), [http://biomass.ucdavis.edu/materials/reports%20and%20publications/2006/2006\\_Biomass\\_Roadmap.pdf](http://biomass.ucdavis.edu/materials/reports%20and%20publications/2006/2006_Biomass_Roadmap.pdf).

71. AIR RES. BD., *supra* note 10, at ES-22.

72. *Id.* at VII-32.

73. *Id.* at VII-32–VII-33.

74. *Low Carbon Fuel Standard Sustainability Workgroup*, AIR RES. BD., CAL. ENVTL. PROT. AGENCY, <http://www.arb.ca.gov/fuels/lcfs/workgroups/lcfsustain/lcfsustain.htm> (last reviewed Sept. 3, 2010).

Similar forestry sustainability standards are in development through the Interagency Forestry Working Group.<sup>75</sup>

### B. Sustainability Through Certification to a Standard

Although RFS2, BCAP, and the California regulations do not (yet) require sustainability certification for energy biomass, certification to a standard is one way to guarantee the sustainability of biomass.<sup>76</sup> “Certification is the process whereby an independent third-party (called a certifier or certification body) assesses the quality of [agronomic] management in relation to a set of predetermined requirements (the standard).”<sup>77</sup> The *standards* define the aim of certification and describe the product or specific production-process requirements to be fulfilled for certification.<sup>78</sup> *Principle* statements establish the standard’s general aspirations by category, *criteria* describe in further detail the principle-specific requirements, and *indicators* provide the details required for measurement.<sup>79</sup> Criteria and indicators can either be prescriptive or performance-based.<sup>80</sup>

The organic food sector was the first to develop a system of certification based on a set of standards beginning in the 1990s, followed shortly thereafter by the forestry sector.<sup>81</sup> Sustainability standards for agriculture other than those for organic food have been slower to develop, particularly in the United States.<sup>82</sup> Although the European Union (EU) has required environmental cross-compliance from agricultural commodity producers since 2003 through its Common Agricultural Policy,<sup>83</sup> agricultural producers in the United States generally are subject to few mandatory conservation measures.<sup>84</sup>

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75. CAT Forest Group/Inter-Agency Forest Working Group, CAL. CLIMATE CHANGE PORTAL, <http://www.climatechange.ca.gov/forestry/index.html> (last modified Jan. 12, 2010).

76. See Norbert Schmitz, *Certification to Ensure Sustainable Production of Biofuels*, 2 BIOTECH. J. 1474 (2007); see also Jody M. Endres, *Clearing the Air: The Meta-Standard Approach to Ensuring Biofuels Environmental and Social Sustainability*, 28 VA. ENVTL. L.J. 73 (2010) (reviewing the universe of biofuels sustainability standards worldwide).

77. Ewald Rametsteiner & Markku Simula, *Forest Certification—An Instrument to Promote Sustainable Forest Management?*, 67 J. ENVTL. MGMT. 87, 88 (2003).

78. I. Lewandowski & A.P.C. Faaij, *Steps Towards the Development of a Certification System for Sustainable Bio-Energy Trade*, 30 BIOMASS & BIOENERGY 83, 89 (2006).

79. See generally *id.*

80. Subhas K. Sikdar, *Sustainable Development and Sustainability Metrics*, 49 AM. INST. CHEMICAL ENGINEERS J. 1928, 1930 (2003).

81. Lewandowski & Faaij, *supra* note 78, at 84.

82. See *id.* at 87–88.

83. See *Agriculture and the Environment: Introduction*, AGRIC. & RURAL DEV., EUROPEAN COMM’N, [http://ec.europa.eu/agriculture/envir/index\\_en.htm](http://ec.europa.eu/agriculture/envir/index_en.htm) (last updated July 7, 2010) (describing generally how environmental concerns are integrated into EU agricultural policy).

84. See generally Angelo, *supra* note 6. Private efforts are ongoing in the United States to create a voluntary sustainability standard for agriculture, including the Stewardship Index for Specialty Crops and the Leonardo Academy Sustainable Agriculture Standard (SCS-001) for food and fiber commodity crops. STEWARDSHIP INDEX FOR SPECIALTY CROPS, <http://www.stewardshipindex.org/> (last visited Jan. 30, 2011); *Sustainable Agriculture Standard*, *supra* note 15.

Only with the advent of renewable energy policy in the past few years, however, has the prospect of sustainability standards for agriculture, beyond organic farming, emerged at the governmental as well as voluntary levels.<sup>85</sup> Emerging standards are performance based, relying on management practices to achieve environmental goals such as reduction of air, water, and soil pollution, and preservation of biodiversity.<sup>86</sup> Typical standards begin with a principle related to management planning that guides each successive principle, as well as criteria within each principle that require principle-specific planning (e.g., nutrient management planning, environmental/habitat assessment). Other environmental principles contained in sustainability standards relate to water, air, soil, and biodiversity protection. Development of private biomass sustainability standards wisely has involved a variety of stakeholders, because priorities and perceptions between them may vary significantly (e.g., industry and trade, buyers and consumers, producers and managers, government and academic representatives, environmental and labor nongovernmental organizations).<sup>87</sup>

*C. The Council for Sustainable Biomass Production (CSBP)  
Provisional Standard*

Standards development for the global agricultural production system, including for energy biomass, is becoming populated increasingly by private actors who seek alternatives to command and control regulation.<sup>88</sup> For example, the United Kingdom's Renewable Transport Fuels Obligation requires sustainability reporting for biomass, but allows obligated parties to use private, third-party certifications.<sup>89</sup> The Roundtable for Sustainable Biofuels, a private, transnational, multi-stakeholder group, is in the process of implementing its practice, chain of custody, and certification body pilot standards for biomass sustainability.<sup>90</sup> In the United States, the CSBP began the process of developing biomass and biofuels standards in early 2007.<sup>91</sup> Its domestic, multi-stakeholder effort among industry, producers, academics, and nongovernmental organizations led to issuance of a provisional standard for biomass in April 2010.<sup>92</sup>

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85. See Endres, *supra* note 76, at 75–77.

86. *Id.* at 93–94.

87. See generally *id.*

88. Doris Fuchs et al., *Actors in Private Food Governance: The Legitimacy of Retail Standards and Multistakeholder Initiatives with Civil Society Participation*, AGRIC. & HUM. VALUES (Sept. 19, 2009), <http://dx.doi.org/10.1007/s10460-009-9236-3>.

89. RENEWABLE FUELS AGENCY, CARBON AND SUSTAINABILITY REPORTING WITHIN THE RENEWABLE TRANSPORT FUEL OBLIGATION 2–3 (2010), [http://www.renewablefuelsagency.gov.uk/sites/rfa/files/RFA\\_C\\_and\\_S\\_TG\\_%20Part\\_One\\_v3\\_2.pdf](http://www.renewablefuelsagency.gov.uk/sites/rfa/files/RFA_C_and_S_TG_%20Part_One_v3_2.pdf); see also Endres, *supra* note 76, at 80–92.

90. *Roundtable on Sustainable Biofuels*, ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE, <http://rsb.epfl.ch/> (last visited Jan. 30, 2011).

91. COUNCIL ON SUSTAINABLE BIOMASS PROD., *supra* note 11, at 4; see also COUNCIL ON SUSTAINABLE BIOMASS PRODUCTION, <http://www.csbp.org/> (last visited Jan. 30, 2011).

92. COUNCIL ON SUSTAINABLE BIOMASS PROD., *supra* note 11, at 1. U.S. government representatives participated in an advisory capacity. *Id.* at 2.

The CSBP scheduled field testing of the provisional standard for the 2010 growing season, with plans to create a full standard by 2012.<sup>93</sup>

The CSBP standard contains nine main principles: integrated resource management planning,<sup>94</sup> soil,<sup>95</sup> biological diversity,<sup>96</sup> water,<sup>97</sup> climate change,<sup>98</sup> socio-economic well-being, legality,<sup>99</sup> transparency, and

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93. *Id.* at 4, 7.

94. In developing the Integrated Resource Management Plan (IRMP), a producer must first assess his or her operation to formulate baseline information, which in turn informs resource goals and land management objectives to meet the criteria and indicators of the standard that also are incorporated into the IRMP. *Id.* “Assessments typically include gathering information on crop production, soils, natural vegetation cover, rare species and communities, existing wildlife habitats and aquatic ecosystems, and past and current land and water conservation activities.” *Id.* Indicator 1.1.S1., at 12; *see also id.* Criterion 1.3, at 13.

95. Principle 2-Soil requires producers to maintain or improve soil health and quality by reducing erosion, maintaining soil carbon and nutrients at “appropriate levels,” and maintaining the chemical, physical, and biological soil properties. *Id.* Criterion 2.1, at 14. Although only gold-level certification requires “comprehensive management planning and implementation of practices,” *id.* Indicator 2.1.G1, silver-level certification does require a soil assessment, including for soil nutrient levels, as well as a nutrient management plan in line with NRCS planning if nutrients are applied. *Id.* Indicator 2.1.S1. Producers must achieve a score of “T” in RUSLE2, *id.* Indicator 2.1.S6, and maintain residues on the field for long-term soil health and to prevent erosion. *Id.* Indicator 2.1.S3. Producers must achieve a zero or positive score on the Soil Conditioning Index (SCI) as a proxy for soil carbon maintenance. *Id.* Indicator 2.1.S7.

96. Principle 3-Biodiversity seeks to protect native wildlife and ecologically-sensitive areas by requiring that the producer, working together with resource agencies and in conjunction with eco-regional, state, and national plans, to assess vegetative cover and habitats on the farm and landscape levels, and implement plans and practices to protect them. *Id.* Criterion 3.1, at 15; *id.* Indicator 3.1.S1. Protected species include: (1) threatened or endangered under the Endangered Species Act; (2) imperiled, critically imperiled, or vulnerable by NatureServe and Natural Heritage Programs; (3) important ecological sites in eco-regional plans; and (4) important habitat and wildlife species in state wildlife plans. *Id.* Indicators 3.1.S1, .S2. Practices to protect biodiversity include polycultured stands, timing of agricultural operations so as not to disturb wildlife, and leaving appropriate ground cover. *Id.* Indicator 3.1.S2. Silver-level producers must control non-crop invasive species, *id.* Indicator 3.1.S4, while gold-level producers must work to enhance biodiversity by reducing the incidence of non-crop species. *Id.* Indicator 3.1.G3, at 16. Gold-level certification adds enhancement and restoration of habitat at landscape levels (e.g., corridors, buffers, unfragmented habitat blocks, prescribed burning). *Id.* Indicator 3.1.G1. Producers must also document land use as of January 1, 2008, and only convert land from certain other uses to another. *Id.* Indicators 3.3.S1, .S2, at 17. A land conversion matrix, and an explanation of issues to be further resolved, is contained in Appendix C. *Id.* at 32–34.

97. The standard contains many criteria related to water quality in Principle 4. *Id.* at 18–21. The first requires an IRMP to address nutrients and agrochemical application. *Id.* Indicator 4.1.S1, at 18. Producers must also test soil and plant tissue as a measure of agrochemical use, as recommended by NRCS. *Id.* When manure is applied, a Comprehensive Nutrient Management Plan must be in place. *Id.* Otherwise, the IRMP suffices to control nutrient application and pesticide drift and runoff. *Id.* In addition, producers are required to use best practices to avoid erosion that degrades water quality, test waste-water irrigation, test for contamination in biosolids, and use best management practices for nitrogen and phosphorus application. *Id.* Indicators 4.1.S2, .S3, .S4, .S5, .S6, at 18–19. Pesticide application cannot harm humans or the environment, and use must score below intermediate on NRCS’s Windows Pesticide Management Tool. *Id.* Indicators 4.1.S7, .S8, at 19. Producers must use integrated pest management when practical. *Id.* Indicator 4.1.S7. In terms of water *quantity*, the standard requires producers to maintain irrigation management plans and protect against salinity and, at the gold level, reduce water usage. *Id.* Indicators 4.2.S1, .S5, .G1, at 20. Producers must maintain stream flow and temperature, and avoid hypoxia, to protect aquatic ecosystems. *Id.* Indicators 4.3.S2, .S3, .S4, at 21.

98. *Id.* at 21. The GHG and soil principles are in great part integrated in relation to maintaining and building soil carbon, and reducing excess nutrient application. The CSBP standard ambitiously aims to measure GHG emissions from agronomic practices, either through individual measurements or default values. *Id.* at 35–36. As part of field testing, producers are required to report yield, inputs

continuous improvement.<sup>100</sup> Each principle contains criteria and indicators, as well as implementation guidance, and is divided into two compliance levels: silver and gold. Although the standard will set metrics when necessary, it recognizes that metrics can be more expensive to test and implement than gauging performance through management practices.<sup>101</sup> Therefore, the standard notes that management practices can serve as an effective proxy for metrics, as demonstrated by the management practices identified by federal and state agencies, universities, and other organizations.<sup>102</sup> Many of the CSBP provisions could be addressed, at least in part, by NRCS practice standards.

### III. NATURAL RESOURCES CONSERVATION SERVICE (NRCS) CONSERVATION PLANNING AND PRACTICES AS A FRAMEWORK FOR MEETING BIOMASS SUSTAINABILITY STANDARDS

The CSBP has made great progress toward a framework that producers are currently field testing. Leading scientists agree, however, that “there is not yet a firm consensus on the extent of [the potential impacts of biofuels production on land use and biodiversity] or how to measure them.”<sup>103</sup> Therefore, policymakers should consider whether existing agro-environmental programs in the United States could guide nascent biomass sustainability efforts by providing much-needed baseline planning frameworks for, and assessments of, land uses and natural resource concerns. Existing programs also can serve as a platform for developing or fortifying agronomic measurement tools, and designing biomass-specific conservation practices, which greatly inform standard implementation. Along with land grant universities and government agencies such as the DOE, EPA, and other departments within USDA, NRCS plays a central role in assisting producers with the conservation requirements of commodity subsidy programs and other conservation programs, particularly in the design and implementation of conservation<sup>104</sup> plans and de-

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(fertilizers, pesticides, fuel), land management practices, and soil carbon, among other factors, as part of a GHG scoring tool that the CSBP is currently developing with the help of an expert panel. *Id.* at 9, 21, 35–36.

99. Although not addressed directly in the standard, it is under this principal that the Council has resolved the issue of the use of genetically-modified organisms (GMOs).

100. *Id.* at 10–25. CSBP-certified producers also make a commitment to “continuously improve practices and outcomes based on the best available science” through monitoring and certification audits. *Id.* at 25. At the gold level, producers must participate in programs that expand public knowledge of sustainable biomass practices, including research trials in collaboration with universities and the federal government. *Id.* Indicator 9.2.G1.

101. *Id.* at 6–7. The drafters question whether a “causal relationship” can be established in certain instances between the resource at issue and a producer’s practices. *Id.* at 6.

102. *Id.* at 6–7.

103. DALE ET AL., *supra* note 31, at 1.

104. The Soil Conservation and Domestic Allotment Act of 1935—the statutory foundation of NRCS conservation programs—defines “conservation” as the prevention of soil erosion in order to “preserve natural resources, control floods, prevent impairment of reservoirs, . . . protect public health, public lands and relieve unemployment.” Soil Conservation and Domestic Allotment Act, ch.

velopment of agronomic practices to meet planning goals.<sup>105</sup> NRCS is postured to play the same important role in implementation of biomass sustainability standards.

A small number of conservation provisions in federal law are mandatory in order to receive payment for commodity production; the main two include: reducing erosion on HEL<sup>106</sup> and a prohibition against the filling of wetlands<sup>107</sup> (commonly known as “sodbuster” and “swampbuster”).<sup>108</sup> Participation in the majority of conservation programs, however, is entirely voluntary for agricultural producers. Conservation program provisions typically are found in Title II of Farm Bills that issue every five years, and either provide for land retirement (the CRP,<sup>109</sup> Wetlands Reserve Program (WRP),<sup>110</sup> and Grasslands Reserve Program (GRP)<sup>111</sup>) or are for “working lands” (the Environmental Quality Incentives Program (EQIP),<sup>112</sup> Wildlife Habitat Incentives Program (WHIP),<sup>113</sup> Farm and Ranch Lands Protection Program,<sup>114</sup> CSP,<sup>115</sup> and BCAP<sup>116</sup>).

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85, Pub. L. No. 74-46, 49 Stat. 163, 163 (1935) (codified at 16 U.S.C. § 590a (2006)). *See generally* Peter R. Hobbs et al., *The Role of Conservation Agriculture in Sustainable Agriculture*, 363 PHIL. TRANSACTIONS ROYAL SOC'Y B. 543 (2007) (describing agricultural conservation).

105. The Soil Conservation and Domestic Allotment Act of 1935 transferred the Soil Erosion Service from the Department of the Interior to USDA, and renamed it the Soil Conservation Service. Soil Conservation and Domestic Allotment Act § 5, 49 Stat. at 164; National Industrial Recovery Act, ch. 90, Pub. L. No. 73-67, §§ 201–203, 48 Stat. 195, 200–03 (1933). In 1994, the Department of Agriculture Reorganization Act renamed it the Natural Resources Conservation Service and made several substantive changes to its mission. *See* Federal Crop Insurance Reform and Department of Agriculture Reorganization Act of 1994, Pub. L. No. 103-354, § 246, 108 Stat. 3178, 3223–25 (codified as amended at 7 U.S.C. § 6962). The Soil Conservation and Domestic Allotment Act of 1935 also added to the duties of NRCS authority over five different conservation programs administered by other USDA agencies, thus broadening its mission to environmental and natural resource conservation. *See generally* NATURAL RES. CONSERVATION SERV., *supra* note 14, § 500.00.

106. 16 U.S.C. §§ 3811–3814 (2006 & Supp. III 2010), *amended by* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 2002, 122 Stat. 1651, 1755–56 (codified at 16 U.S.C. § 3812(f)).

107. 16 U.S.C. §§ 3821–3824, *amended by* Food, Conservation, and Energy Act sec. 2003, 122 Stat. at 1756 (codified at 16 U.S.C. § 3822(h)).

108. For an overview of conservation requirements in U.S. agricultural subsidies, *see* CHARLES E. HANRAHAN & JEFFREY ZINN, CONG. RESEARCH SERV., RL 32,624, GREEN PAYMENTS IN U.S. AND EUROPEAN UNION AGRICULTURAL POLICY 1–8 (2005), <http://www.nationalaglawcenter.org/assets/crs/RL32624.pdf>.

109. 16 U.S.C. §§ 3831–3835a, *amended by* Food, Conservation, and Energy Act secs. 2101–2111, 122 Stat. at 1756–64 (codified at 16 U.S.C. §§ 3831–3832, 3834–3835); U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, Pub. L. No. 110-28, § 4101, 121 Stat. 112, 152 (2007) (to be codified at 16 U.S.C. § 3831(k)(2)) (renumbered and amended by Food, Conservation, and Energy Act sec. 2106(b), 122 Stat. at 1760 (codified at 16 U.S.C. § 3831a)).

110. 16 U.S.C. §§ 3837–3837f, *amended by* Food, Conservation, and Energy Act secs. 2201–2209, 122 Stat. at 1764–68 (codified at 16 U.S.C. §§ 3837, 3837a, 3837c–3837f).

111. Food, Conservation, and Energy Act secs. 2301(a)(1), 2403, 122 Stat. at 1768, 1779–85 (codified at 16 U.S.C. §§ 3838n–3838q).

112. 16 U.S.C. §§ 3839aa, 3839aa-4–3839aa-7, *amended by* Food, Conservation, and Energy Act secs. 2501–2510, 122 Stat. at 1785–95 (codified at 16 U.S.C. §§ 3839aa–3839aa-9).

113. 16 U.S.C. § 3839bb-1, *amended by* Food, Conservation, and Energy Act sec. 2602, 122 Stat. at 1796 (codified at 16 U.S.C. § 3839bb-1).

114. Food, Conservation, and Energy Act sec. 2401(b), 122 Stat. at 1777–79 (codified at 16 U.S.C. § 3838i); *see Farm and Ranch Lands Protection Program*, NATURAL RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/programs/frpp/> (updated Jan. 24, 2011).

NRCS's framework for conservation relies on policies (general manuals), procedures (handbooks), technical guidance (field office technical guidance), tools, and program guidance (manuals). General manuals provide the foundational, overarching guidance for NRCS's conservation planning and practices. *General Manuals (Title) 180*<sup>117</sup> and *450*<sup>118</sup> describe NRCS policy nationwide for development of technical guidance for the conservation practice standards that producers incorporate into their planning. Manuals establish guidance and policy aimed at implementation of specific federal programs, such as the *National Food Security Act Manual* (to implement HEL and wetland requirements)<sup>119</sup> and the other federal programs listed above.<sup>120</sup> One of the most significant manuals, however, in terms of future development of biomass cropping practices, is the *National Agronomy Manual* (NAM).<sup>121</sup> The NAM "contains policy for agronomy activities and provides technical procedures for uniform implementation of agronomy tools and applications."<sup>122</sup>

In addition to general manuals and manuals, NRCS uses handbooks that further detail procedures for field office staff to use in implementing conservation policies and practices. Two of these handbooks are of particular relevance to setting biomass sustainability standards: the *National Planning and Procedures Handbook* (NPPH)<sup>123</sup> and the *National Handbook of Conservation Practices* (NHCP).<sup>124</sup> Additional handbooks include: the *National Environmental Compliance Handbook*, which contains compliance guidance for the National Environmental Policy Act (NEPA), the Endangered Species Act, and other federal environmental requirements;<sup>125</sup> the *Comprehensive Nutrient Management Planning Handbook*, which details the planning process and standards for animal feeding operations as well as range and pastures;<sup>126</sup> and the *Technical Service Provider Handbook*.<sup>127</sup> Technical service providers will be the

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115. Food, Conservation, and Energy Act sec. 2301(a)(2), 122 Stat. at 1768–76 (codified at 16 U.S.C. §§ 3838d–3838g).

116. *Id.* sec. 9001(a), § 9011, at 2089–93 (codified at 7 U.S.C. § 8111). Congress placed BCAP under the energy title (IX), instead of under Title II (conservation). *Id.* sec. 9001(a), at 2064; *see id.* at 1753.

117. *General Manual*, NATURAL RES. CONSERVATION SERV., tit. 180, pt. 409, §§ 409.0–409.11, <http://policy.nrcs.usda.gov/> (follow "General Manual" hyperlink) (last visited Jan. 30, 2011).

118. *Id.* tit. 450, pts. 401–412.

119. The Manuals contains, for example, a HEL soil erodibility index. *See Manuals*, NATURAL RES. CONSERVATION SERV., tit. 180, National Food Security Act Manual, Fourth Edition, pt. 511, subpt. A, § 511.01, <http://policy.nrcs.usda.gov/> (follow "Manuals" hyperlink) (last visited Jan. 30, 2011).

120. *Id.* tit. 440, pts. 514–515, 517–518, 523.

121. NATURAL RES. CONSERVATION SERV., *supra* note 14.

122. *Id.* § 500.01.

123. *Handbooks*, *supra* note 1, tit. 180, pt. 600.

124. *Id.* tit. 450, National Handbook of Conservation Practices.

125. *Id.* tit. 190, pt. 601.

126. *Id.* tit. 190, pt. 620.

127. *Id.* tit. 180, pt. 610. NRCS can pay private technical service providers (TSPs) to assist producers in implementing conservation programs. *Id.* tit. 180, pt. 610, subpt. A, § 610.0.

critical link between biomass producers and the sustainability practices NRCS may develop.

At the ground level, the NRCS *Field Office Technical Guidance* (FOTG) directs the planning process and implementation of conservation practices. In addition to its role as the “primary scientific” reference for NRCS, the FOTG contains county-level resource targets and practices that achieve those targets.<sup>128</sup> Each state’s FOTG is approved by the State Conservationist. For each state, the FOTG contains five sections:

- (I) General References (including links to manuals and handbooks, modeling tools, maps, watershed information, and agricultural laws and regulations);
- (II) Soil and Site Information (detailed information on soil, water, air, plant, and animal resources, as well as soil surveys, wildlife habitat evaluation guides, water quality guides, and cropland production tables);
- (III) Conservation Management Systems (the resource concern and accompanying quality criteria);
- (IV) Practice Standards and Specifications (detailed requirements for installing the practice in the particular state); and,
- (V) Conservation Effects (how the conservation practice affects each identified resource concern in the state).<sup>129</sup>

#### A. NRCS’s Conservation Planning and Practices Framework

NRCS tailors its services to the individual goals of the producer, depending on the federal conservation program for which the producer seeks payment. Regardless of the subsidy program, however, NRCS follows a general framework to identify “resource concerns” and to design conservation plans and practice. The choice of conservation practice implemented depends on the resource concern at issue and the NRCS quality criteria that applies to that resource concern.

##### 1. Identifying Resource Concern(s)

Various federal acts direct NRCS to continuously assess the needs and status of soil, water, and related natural resources in the United

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128. *Welcome to eFOTG*, NATURAL RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/technical/efotg/> (last visited Jan. 30, 2011).

129. *Id.* NRCS’s eFOTG website contains a U.S. map that the user can click on to find state-specific requirements. NRCS often combines sections III and IV within a table for each general resource concern. Producers can click on each resource concern within the eFOTG (soil, water, air, plant, animal, human) to find descriptions of: (1) the specific concerns within that category, (2) the national quality criteria, (3) measurement units, (4) state-specific criteria, and (5) assessment tools. *See id.*

States.<sup>130</sup> The primary mechanism for gathering this resource information is through the National Resource Inventory (NRI). The NRI uses statistical surveys based on sample data taken at various sites within states through on-site visits, remote sensing imagery, and “ancillary materials” containing data.<sup>131</sup> NRCS coordinates the NRI with other government resource assessments “when feasible, practical, and consistent with NRCS’s conservation mission.”<sup>132</sup> NRCS conducts the NRI on an annual basis<sup>133</sup> to estimate land use, the landscape and soil, ecological site information, rangeland health, invasive/noxious plant presence, disturbance indicators, conservation practices and resource concerns, plant composition and patterns, and plant production, cover, density, and height.<sup>134</sup> “Resource concerns” are the problems NRCS identifies in the NRI that in turn form the building blocks of quality criteria in conservation planning and management, as well as support overall development of agro-environmental policy and programs.<sup>135</sup> NRCS categorizes resource concerns by the areas in which they can occur: soil, water, air, plant, and animal (SWAPA).<sup>136</sup> NRCS has also added human resources and energy to the SWAPA equation.<sup>137</sup>

## 2. *Conservation Management Practices and Quality Criteria*

NRCS’s NAM provides a general reference of conservation practices, which NRCS defines as “specific treatment, such as a structural or vegetative measure, or management technique, commonly used to meet specific needs in planning and implementing conservation, for which [quality] standards and specifications have been developed.”<sup>138</sup> The first NAM chapters detail water and wind erosion and the tools that measure them, as well as control measures, and the succeeding chapters address

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130. *General Manual*, *supra* note 117, tit. 290, pt. 400, subpt. A, § 400.1(A) (detailing the legislation).

131. *Id.* tit. 290, pt. 400, subpt. B, § 400.11(B); *see also* JERRY T. HARLOW, NATURAL RES. CONSERVATION SERV., HISTORY OF SOIL CONSERVATION SERVICE NATIONAL RESOURCE INVENTORIES (June 22, 1994), <http://www.nh.nrcs.usda.gov/technical/Publications/NRIHistory.pdf> (detailing successive national resource inventories).

132. *General Manual*, *supra* note 117, tit. 290, pt. 400, subpt. B, § 400.11(D)(3).

133. During 1977–1997, NRCS conducted the survey every five years. Starting in 2000, NRCS began conducting the survey every year. *NRI/Wetlands: Questions and Answers*, NATURAL RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/technical/NRI/qa.html> (last visited Jan. 30, 2011).

134. NATURAL RES. CONSERVATION SERV., U.S. DEP’T OF AGRIC., 2007 NATIONAL RESOURCES INVENTORY (NRI) RANGELAND FIELD STUDY HANDBOOK OF INSTRUCTIONS ch. 1, at 1-1 (2007), available at <http://www.ncgc.nrcs.usda.gov/products/nri/range/2007range.html>.

135. *General Manual*, *supra* note 117, tit. 290, pt. 400, subpt. B, § 400.10.

136. NATURAL RES. CONSERVATION SERV., *supra* note 134, ch. 13, at 13-2.

137. NATURAL RES. CONSERVATION SERV., CONSERVATION STEWARDSHIP PROGRAM: PROGRAMMATIC ENVIRONMENTAL ASSESSMENT 7 (2009), [http://www.nrcs.usda.gov/programs/env\\_assess/fonsi\\_files/CSP\\_Env\\_Assess\\_Final\\_060809.pdf](http://www.nrcs.usda.gov/programs/env_assess/fonsi_files/CSP_Env_Assess_Final_060809.pdf). This is consistent with resource concerns identified in scientific literature. *See, e.g.*, L. Reijnders, *Conditions for the Sustainability of Biomass Based Fuel Use*, 34 ENERGY POL’Y 863 (2006).

138. NATURAL RES. CONSERVATION SERV., *supra* note 14; *Manuals*, *supra* note 119, tit. 440, pt. 518, subpt. H, § 518.71(A)(1).

cropping practices (crop rotation, tillage, and residues), water management (soil moisture), plant attributes (vegetative stabilization and suitability for crop production systems), cropland conservation management systems, soils (surveys, interpretation, and management), and data management.<sup>139</sup> Each chapter also contains a related bibliography of foundational research. The chapter on cropland conservation management systems identifies resource concerns and the management practices/treatments that can improve the resource or reduce harm to it.<sup>140</sup> The management practices are categorized as *National Practice Standard Codes*.

Compared to the NAM that is more general in nature, the NHCP more specifically sets conservation practices and minimum quality criteria<sup>141</sup> for each resource concern, and then outlines “why and where the [conservation] practice is applied” to meet the quality criteria.<sup>142</sup> Each NHCP conservation practice is broken down further, ranging from “brush management” to “windbreak/shelterbelt renovation.”<sup>143</sup> Within these practices, to measure individual effectiveness, NRCS may incorporate modeling tools such as the Soil Conditioning Index (SCI) to measure whether, for example, cover cropping has a positive effect on soil organic matter (SOM).<sup>144</sup> These cornerstone practices and quality criteria then are tailored to state-specific conditions within state-specific FOTG.<sup>145</sup>

Where no practice standard exists, the NHCP establishes procedures for developing an interim standard, including interfacing with researchers from universities and the Agricultural Research Service (ARS),<sup>146</sup> producers, industry, and NRCS field offices.<sup>147</sup> These proce-

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139. NATURAL RES. CONSERVATION SERV., *supra* note 14, pts. 500–509. The pest and nutrient management portions remain under development. *See id.* pt. 503, subpts. 503C–503D.

140. *Id.* pt. 507, subpts. 507.12–507.13.

141. NRCS defines quality criteria as “[a] quantitative or qualitative statement of a treatment level required to achieve [a resource management system] for identified resource considerations for a particular land area. It is established in accordance with local, state, and federal programs and regulations in consideration of ecological, economic, and social effects. *Handbooks, supra* note 1, tit. 180, pt. 600, subpt. G.

142. *Id.* tit. 450, National Handbook of Conservation Practices; *National Conservation Practice Standards—NHCP*, NATURAL RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/technical/standards/nhcp.html> (last visited Jan. 30, 2011).

143. *National Conservation Practice Standards—NHCP, supra* note 142; *see also infra* note 199 and accompanying text (describing the national conservation practice standard for pest management and water quality).

144. NATURAL RES. CONSERVATION SERV., CONSERVATION PRACTICE STANDARD: COVER CROP (AC.), CODE 340 (Sept. 2010), <ftp://ftp-fc.sc.egov.usda.gov/NHQ/practicestandards/standards/340.pdf>.

145. NRCS maintains a main webpage where the user can click on an individual state to access that state’s FOTG (eFOTG). *Welcome to eFOTG, supra* note 128.

146. *Science and Technology FAQ’s*, NATURAL RES. CONSERVATION SERV., [http://www.nrcs.usda.gov/sciencetech\\_faq.html](http://www.nrcs.usda.gov/sciencetech_faq.html) (last visited Jan. 30, 2011). NRCS maintains the NRCS Science and Technology Consortium to “acquire, develop, and transfer technology” (including tools and other resource information). *Id.* The Partnership Management Team (PMT) brings together scientists and administrators from NRCS, ARS, and the Cooperative State Research, Education, and Extension Service (CSREES) to collaborate on natural resource and environmental issues. *Id.*; *see also Memorandum of Understanding*, AGRIC. RESEARCH SERV. (Oct. 2, 2000), <http://www.ars.usda.gov/>

dures for interim development of practices and quality criteria will be critical to the development of standardized practices and quality criteria for biomass cropping, an area in which many conservation practices and effects are only beginning to be understood.

### 3. Conservation Planning

The goal of conservation planning is to provide producers a framework to implement the conservation management practices detailed above to protect soil, water, air, plant, and animal resources, while at the same time “considering the client’s economic and social needs.”<sup>148</sup> The process holistically centers around development of a Resource Management System (RMS).<sup>149</sup> NRCS aims, through the RMS, to establish producer practices and activities that meet or exceed quality criteria developed by NRCS.<sup>150</sup> Although NRCS sets the RMS as a minimum goal, it allows producers who are not “ready, willing, and able” to meet all criteria to “[p]rogressive[ly]” plan.<sup>151</sup> Individual components of the RMS include comprehensive nutrient management plans for animal feeding operations<sup>152</sup> and other “special environmental concerns” that rely on laws,

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pmt/nrtpmou.html (establishing the PMT). Part of ARS’s strategic plan for 2006–2011 is to “[d]evelop technologies for the sustainable production and collection of biomass feedstocks.” AGRIC. RESEARCH SERV., U.S. DEP’T OF AGRIC., STRATEGIC PLAN FOR FY 2006–2011, 6 (2007), <http://www.ars.usda.gov/SP2UserFiles/Place/00000000/ARSStrategicPlan2006-2011.pdf>. ARS also maintains a National Program for Natural Resources and Sustainable Agricultural Systems, which includes Soil Resource Management (#202), Integrated Agricultural Systems (#207), and Bioenergy (#213). *National Programs*, AGRIC. RESEARCH SERV., <http://www.ars.usda.gov/research/programs.htm> (last modified Jan. 27, 2011). Each of these programs is conducting research that could lead to development of quality criteria for biomass cropping and harvesting, including: stover removal for biofuel production (the Renewable Energy Assessment Project (REAP)), soil carbon cycling and tillage management, agroforestry inventory and evaluation of GHG mitigation (#202); environmental and economic consequences of biomass feedstock production in the northern Great Plains and sustainable cropping systems for harvesting corn stover for biomass (#207); and sustainable cropping systems for biofuels, improving uses of biofuels’ byproducts, and biomass conversion and crop breeding (#213). See *National Program 202: Soil Resource Management*, AGRIC. RESEARCH SERV., [http://www.ars.usda.gov/research/programs/programs.htm?NP\\_CODE=202](http://www.ars.usda.gov/research/programs/programs.htm?NP_CODE=202) (last modified Oct. 24, 2008) (and links therein); *National Program 207: Integrated Farming Systems*, AGRIC. RESEARCH SERV., [http://www.ars.usda.gov/research/programs/programs.htm?NP\\_CODE=207](http://www.ars.usda.gov/research/programs/programs.htm?NP_CODE=207) (last modified Apr. 1, 2009) (and links therein); *National Program 213: Bioenergy*, AGRIC. RESEARCH SERV., [http://www.ars.usda.gov/research/programs/programs.htm?NP\\_CODE=213](http://www.ars.usda.gov/research/programs/programs.htm?NP_CODE=213) (last modified June 17, 2010) (and links therein).

147. *Exhibit 2: Interim Conservation Practice Standards, in Handbooks, supra* note 1, tit. 450, National Handbook of Conservation Practices.

148. *General Manual, supra* note 117, tit. 180, pt. 409, § 409.1(a).

149. *Handbooks, supra* note 1, tit. 180, pt. 600, subpt. A, § 600.11(a). The NPPH defines the RMS as “a combination of conservation practices and resource management, identified by land or water uses, for the treatment of all resource concerns for soil, water, air, plants, and animals that meets or exceeds the quality criteria in the Field Office Technical Guide (FOTG) for resource sustainability.” *Id.*

150. *General Manual, supra* note 117, tit. 180, pt. 409, § 409.1(a)(1).

151. *Id.* tit. 180, pt. 409, § 409.1(a)(2); see also *infra* text accompanying notes 221–22 (explaining that to earn CSP payments, producers must achieve an additional conservation threshold for a resource concern within the contract period).

152. *Handbooks, supra* note 1, tit. 180, pt. 600, subpt. E, § 600.50; *id.* tit. 190, pt. 620.

policies, and NRCS guidance outside the NPPH.<sup>153</sup> NRCS encourages producers subject to mandatory conservation (e.g., HEL requirements) to incorporate those practices in the conservation plan.<sup>154</sup> Local conservation districts, and Resource Conservation and Development Councils, play an important role in targeting resource concerns and assisting local NRCS offices and producers with development of area-wide and individual conservation plans.<sup>155</sup>

The NPPH primarily guides the NRCS planning process,<sup>156</sup> which NRCS coordinates within a multi-tiered structure.<sup>157</sup> At the broadest level, area-wide conservation plans and assessments, either led or assisted by NRCS, guide actions at a watershed or larger geographic level.<sup>158</sup> Area-wide assessments encompass individual operations, “land units” within those operations, and subunits.<sup>159</sup> The entire individual planning process covers, in addition to a preplanning process,<sup>160</sup> three

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153. *Id.* tit. 180, pt. 600, subpt. F, exhibit 3.

154. *General Manual*, *supra* note 117, tit. 180, pt. 409, § 409.1(b).

155. *Id.* tit. 180, pt. 409, § 409.1(c); *Handbooks*, *supra* note 1, tit. 180, pt. 600, subpt. A, § 600.10. See generally *Manuals*, *supra* note 119, tit. 440, pt. 518, subpt. B, § 518.13 (describing the contribution of conservation districts to planning, including:

- (1) Assess natural resource conditions and needs
- (2) Identify local natural resource priorities and available resources
- (3) Convene the local working groups impacted by the selected watersheds
- (4) Provide input and recommendations to NRCS for CSP guidelines
- (5) Provide technical assistance
- (6) Assist NRCS with information and outreach programs
- (7) Recommend criteria for enhancement activity payments
- (8) In carrying out the role of contract violations and terminations, the State Conservationist may consult with the local conservation district
- (9) Other responsibilities as requested).

Local work groups also advise NRCS on implementation of conservation measures. *Id.* tit. 440, pt. 500; *id.* tit. 440, pt. 518, subpt. B, § 518.15.

156. *Handbooks*, *supra* note 1, tit. 180, pt. 600, subpt. A, § 600.10. The NPPH states that:

The term “stewardship” has been used since the beginning of the conservation movement. Webster defines stewardship as “the individual’s responsibility to his life and property with proper regard to the rights of others.” In this sense, stewardship implies that landowners view their actions in terms of how they affect their neighbors, their grandchildren, and all those that might be influenced by their production and conservation decisions.

Seen in this light, stewardship is about being responsible. It is about changing attitudes, forging local shared visions of the desired state for private and public natural resources, and facilitating the actions needed to realize the desired future condition. Institutionally, stewardship is about assisting land users to care for the resources.

*Id.* tit. 180, pt. 600, subpt. D, § 600.46(e).

157. *Id.* tit. 180, pt. 600, subpt. A, § 600.11.

158. Areawide assessments or plans can be conducted by informal or formal groups of local landowners and a wide variety of other organizations, including irrigation and watershed districts. *Id.* tit. 180, pt. 600, subpt. A, § 600.11(d).

159. *Id.* tit. 180, pt. 600, subpt. A, § 600.11.

160. *Id.* tit. 180, pt. 600, subpt. A, § 600.13.

phases and a total of nine steps.<sup>161</sup> The result is a conservation plan, which NRCS describes as:

voluntary, site-specific, comprehensive, and action oriented. A conservation plan contains natural resource information and a record of decisions made by the client. It describes the schedule of operations and activities needed to solve identified natural resource problems and take advantage of opportunities. Using the planning process to develop conservation plans helps ensure that the needs of the client and the resources will be met, and that federal, state, and local requirements will be achieved.<sup>162</sup>

During phase I, the producer identifies resource problems/conditions and production objectives and analyzes existing information about the resources at issue.<sup>163</sup> Sources of information available to the producer include data from on-site evaluations, area-wide assessments or plans, external sources such as universities, and NRCS resources such as soil surveys,<sup>164</sup> manuals, handbooks, and the FOTG.<sup>165</sup> Local Conservation District preferences and resources also are identified.<sup>166</sup> Resource problems or conditions include those related to soil quality and quantity (e.g., erosion, condition, deposition), surface and ground water quality and quantity, air quality, plant-specific conditions (diversity loss, noxious or invasive weeds, endangered species, pest infestation, deforestation), animals (wetland and other habitat quality), and human social and economic conditions.<sup>167</sup> The producer also may apply tools to determine whether a potential erosion problem exists.<sup>168</sup>

Based on the assessment, the producer then formulates, evaluates, and chooses from alternative actions to remedy resource problems.<sup>169</sup> NRCS recommends alternatives that span

[a] broad range of technically feasible alternatives . . . includ[ing] an appropriate mix of structural measures . . . non-structural measures such as crop residue management, livestock exclusion, and flood-proofing; market-based measures such as cost-sharing, easements,

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161. *Id.* tit. 180, pt. 600, subpt. B, § 600.20.

162. *Id.* tit. 180, pt. 600, subpt. A, § 600.11(c).

163. *Id.* tit. 180, pt. 600, subpt. B, § 600.20.

164. NRCS also determines whether the land is subject to HEL requirements. 16 U.S.C. §§ 3811–3814 (2006 & Supp. III 2010), *amended by* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 2002, 122 Stat. 1651, 1755–56 (codified at 16 U.S.C. § 3812(f)). The CSP contract requires the producer to submit Form AD-1026, which certifies that the requirements for HEL and wetland conservation are met. *See Manuals, supra* note 119, tit. 180, National Food Security Act Manual, Fourth Edition, pt. 511, subpt. B, § 511.10; U.S. DEP'T OF AGRIC., FORM AD-1026 (Apr. 20, 2006), [http://forms.sc.egov.usda.gov/efcommon/eFileServices/eFormsAdmin/AD1026\\_060420V01.pdf](http://forms.sc.egov.usda.gov/efcommon/eFileServices/eFormsAdmin/AD1026_060420V01.pdf).

165. *Handbooks, supra* note 1, tit. 180, pt. 600, subpt. B, § 600.21; *id.* tit. 180, pt. 600, subpt. D, § 600.40. Detailed inventory methods for each resource concern are contained in the National Agronomy Manual. *See NATURAL RES. CONSERVATION SERV., supra* note 14.

166. *Handbooks, supra* note 1, tit. 180, pt. 600, subpt. A, § 600.10.

167. *Id.* tit. 180, pt. 600, subpt. F, exhibit 1.

168. *Id.* tit. 180, pt. 600, subpt. B, § 600.24; *see also infra* Part III.B.

169. *Handbooks, supra* note 1, tit. 180, pt. 600, subpt. B, §§ 600.24–.27.

and local tax incentives; and institutional measures such as zoning or local regulations, and state and federal laws and regulations.<sup>170</sup>

Plans must evaluate alternative practices not in isolation, but instead must be “aware of the effects on all resources.”<sup>171</sup> Phase III concludes with plan implementation and evaluation.<sup>172</sup> Producer evaluation provides important feedback so that the producer and NRCS can adjust quality criteria or practices.<sup>173</sup> Evaluation can include a case study of a practice or set of practices from a given site, which can play an important role in building the FOTG.<sup>174</sup> The completed conservation plan is contained in an NRCS case file, along with supporting documents.<sup>175</sup> The producer has parallel obligations during the planning process, such as NEPA and Endangered Species Act compliance.<sup>176</sup>

### B. *Tools for Estimating Biomass Sustainability*

A detailed discussion of agronomic tools that measure elements of sustainability is beyond the scope of this Article, as many exist worldwide. Tools, models, and other guidance currently deployed by NRCS gauge soil properties, manage invasiveness/noxiousness, measure carbon sequestration and emissions from agronomic practices, and address other environmental media such as biodiversity and water quality. NRCS, and other sustainability standards efforts, likely either will modify existing models and tools, or develop new ones, to address biomass cropping scenarios. This can only occur, however, once the scientific community has collected the necessary data and developed corresponding methodologies. Efforts are ongoing on many fronts, both within private standard field testing, as well as at companies and universities. Federal monies fund significant research, and federal agencies are developing methods to measure specifically the environmental, social, and economic effects of biomass systems.

A primary focus of agricultural conservation activities always has been the preservation of soil quality. NRCS conducts soil surveys to provide producers with information regarding differences in soils and environmental features that influence their use, management, and behavior, such as soil type/taxonomy, structure, productivity, erosion, drain-

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170. *Id.* tit. 180, pt. 600, subpt. B, § 600.25(a).

171. *Id.* tit. 180, pt. 600, subpt. D, § 600.41(a). As an example, NRCS states that its “involvement with water quality has brought this reality to the forefront, as has the public’s growing concern for the environment, especially wetland protection, food and water safety, fish and wildlife protection and enhancement, and a sustainable agriculture.” *Id.*

172. *Id.* tit. 180, pt. 600, subpt. B, §§ 600.28–.29.

173. *Id.* tit. 180, pt. 600, subpt. B, § 600.29.

174. *Id.* tit. 180, pt. 600, subpt. D, § 600.42(d).

175. *Id.* tit. 180, pt. 600, subpt. B, § 600.28; *see also id.* tit. 180, pt. 600, subpt. C, § 600.31 (detailing the format and constituent parts of the individual conservation plan); *id.* tit. 180, pt. 600, subpt. C, § 600.32 (detailing the format and constituent parts of the area-wide conservation plan).

176. *Id.* tit. 180, pt. 600, subpt. D, §§ 600.45, 600.47; *General Manual*, *supra* note 117, tit. 190, pt. 410, subpt. B, § 410.22(b).

age/infiltration, temperature, animal presence, and chemical properties (such as pH and salinity).<sup>177</sup> NRCS has identified soil erosion<sup>178</sup> and soil condition (i.e., organic matter depletion, compaction, contaminants) as particular resource concerns.<sup>179</sup> For each of these concerns, national and state quality criteria exist that may require, for example, a certain score on a soils modeling tool such as the Revised Universal Soil Loss Equation (RUSLE2)<sup>180</sup> or the SCI.<sup>181</sup>

Invasiveness and/or noxiousness<sup>182</sup> almost certainly will become a hot-button issue, particularly if scientists genetically modify biomass crops to increase yields and for disease resistance. The introduction of invasive species for nonbioenergy purposes has caused billions of dollars in economic damage,<sup>183</sup> and threatens biodiversity.<sup>184</sup> Environmental and other plaintiffs such as organic farmers vigorously have challenged the efficacy of USDA's environmental impact assessment under the NEPA<sup>185</sup> for approvals of GM commodity crops such as alfalfa<sup>186</sup> and sugar beets.<sup>187</sup> The distrust from these bitter battles likely will spill over to GM bioenergy crops, and will threaten timely deployment if government and indus-

177. *Handbooks*, *supra* note 1, tit. 430, National Soil Survey Handbook, pt. 600, § 600.00, available at [ftp://ftp-fc.sc.egov.usda.gov/NSSC/Soil\\_Survey\\_Handbook/600.doc](ftp://ftp-fc.sc.egov.usda.gov/NSSC/Soil_Survey_Handbook/600.doc). USDA, in conjunction with either the state's agricultural experiment station or land grant university, conducts the National Cooperative Soil Survey. U.S. DEP'T OF AGRIC., SOIL SURVEY MANUAL 13 (1993), [ftp://ftpfc.sc.egov.usda.gov/NSSC/Soil\\_Survey\\_Manual/pdf/SSM.pdf](ftp://ftpfc.sc.egov.usda.gov/NSSC/Soil_Survey_Manual/pdf/SSM.pdf).

178. For a detailed description of soil erosion, see U.S. DEP'T OF AGRIC., *supra* note 177, at 80–89.

179. See, e.g., NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., SOIL QUALITY RESOURCE CONCERNS: SOIL EROSION (1996), [http://soils.usda.gov/sqi/publications/files/sq\\_two\\_1.pdf](http://soils.usda.gov/sqi/publications/files/sq_two_1.pdf); SOIL QUALITY INST., U.S. DEP'T OF AGRIC., SOIL QUALITY TECHNICAL NOTE NO. 5: MANAGING SOIL ORGANIC MATTER (2003), [http://soils.usda.gov/sqi/concepts/soil\\_organic\\_matter/files/sq\\_tn\\_5.pdf](http://soils.usda.gov/sqi/concepts/soil_organic_matter/files/sq_tn_5.pdf).

180. RUSLE2 is NRCS's official modeling tool for predicting soil loss due to water erosion. NATURAL RES. CONSERVATION SERV., *supra* note 14, § 501.20. NRCS's official version of RUSLE2 is available for free download. REVISED UNIVERSAL SOIL LOSS EQUATION, VERSION 2 (RUSLE2), <http://fargo.nserl.purdue.edu/> (last visited Jan. 30, 2011).

181. The SCI measures soil organic matter (SOM). NATURAL RES. CONSERVATION SERV., *supra* note 14, § 508.30(c). SOM is one indicia of sustainability because, among its other benefits, SOM increases soil productivity, cycles nutrients, and prevents water pollution. SOIL QUALITY INST., U.S. DEP'T OF AGRIC., SOIL QUALITY—AGRONOMY TECHNICAL NOTE NO. 16: INTERPRETING THE SOIL CONDITIONING INDEX 1 (2003), [http://soils.usda.gov/sqi/management/files/sq\\_atn\\_16.pdf](http://soils.usda.gov/sqi/management/files/sq_atn_16.pdf).

182. NRCS defines noxious weeds as “possess[ing] one or more of the characteristics of being aggressive and difficult to manage, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof.” U.S. DEP'T OF AGRIC., DR-9500-010, POLICY OF NOXIOUS WEED MANAGEMENT 4 (1990), [http://www.fsa.usda.gov/Internet/FSA\\_File/dr9500-010.pdf](http://www.fsa.usda.gov/Internet/FSA_File/dr9500-010.pdf). The National Invasive Species Advisory Committee basically defines noxious and invasiveness similarly. See NAT'L INVASIVE SPECIES COUNCIL, 2008–2012 NATIONAL INVASIVE SPECIES MANAGEMENT PLAN 7 (2008), [http://www.invasivespecies.gov/home\\_documents/20082012%20National%20Invasive%20Species%20Management%20Plan.pdf](http://www.invasivespecies.gov/home_documents/20082012%20National%20Invasive%20Species%20Management%20Plan.pdf).

183. NAT'L INVASIVE SPECIES COUNCIL, *supra* note 182, at 4.

184. See e.g., Alycia L. Stigall, *Invasive Species and Biodiversity Crises: Testing the Link in the Late Devonian*, PLOS ONE, Dec. 2010, at 1, 5.

185. National Environmental Policy Act of 1969, Pub. L. No. 91-190, 83 Stat. 852 (1970) (codified as amended at 42 U.S.C. §§ 4321–4347 (2006)).

186. *Seeds of Change: Rows Over GM Crops*, ECONOMIST, Jan. 8, 2011, at 32.

187. William Neuman & Andrew Pollack, *Duel over Sugar Beet Seeds Could Create Shortage*, N.Y. TIMES, Dec. 3, 2010, at B7.

try do not follow adequate environmental review and other measures.<sup>188</sup> NRCS states that its role in invasive species management, among others, is to encourage the use of native species or, when conservation goals demand, non-natives.<sup>189</sup> Although NRCS has not historically played a role in the regulation of GM crops, it maintains an invasive and noxious weed list and is responsible, as part of the National Invasive Species Management Plan (NISMP), for preventing the introduction of invasive or noxious species and developing best management practices.<sup>190</sup> NRCS conservation plans embody these considerations.<sup>191</sup>

Estimating the contribution of agronomic practices to carbon flux is critical to many government bioenergy and GHG programs that reward GHG reduction, including RFS2, the Clean Air Act Tailoring Rule, and implementation of California's Global Warming Solutions Act. EPA and ARB currently rely on variations of the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model to measure the life cycle carbon footprint of fuels, which includes default assumptions regarding agronomic practices.<sup>192</sup> NRCS has funded development at Colorado State University of the Carbon Management Evaluation Tool-Voluntary Reporting (COMET-VR),<sup>193</sup> which agricultural producers can use to estimate generally annual carbon fluxes for programs such as the CSP<sup>194</sup> and the DOE's 1605(b) voluntary GHG reporting.<sup>195</sup> In addition, ARS has developed CQESTR, a more short-term and detailed model for estimating on-farm carbon storage.<sup>196</sup> A similar mod-

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188. See Joseph M. Ditomaso et al., *Biofuel vs. Bioinvasion: Seeding Policy Priorities*, 44 ENVTL. SCI. & TECH. 6906, 6907 (2010) (contending that more coordination between government agencies is necessary).

189. *General Manual*, supra note 117, tit. 190, pt. 414, subpt. B, § 414.11(4)–(5). Despite this policy, however, NRCS has allowed millions of acres of CRP land to be planted with non-natives. See MEGAN MCLACHLAN & MIKE CARTER, U.S. DEP'T OF AGRIC., EFFECTS OF THE CONSERVATION RESERVE PROGRAM ON PRIORITY SHORTGRASS PRAIRIE BIRDS: A CONSERVATION EFFECTS ASSESSMENT PROJECT 14 tbl.5 (2009), [ftp://ftpfc.sc.egov.usda.gov/NHQ/nri/ceap/PLJV\\_BCR18\\_CEAP\\_report\\_090630.pdf](ftp://ftpfc.sc.egov.usda.gov/NHQ/nri/ceap/PLJV_BCR18_CEAP_report_090630.pdf) (noting that the majority of CRP lands are planted in non-native grasses).

190. President Clinton's 1999 Executive Order 13,112 created the National Invasive Species Council (NISC) and the Invasive Species Advisory Committee (ISAC). Exec. Order No. 13,112, 3 C.F.R. 159, 159 (2000), reprinted as amended in 42 U.S.C. § 4321 app. at 782–83; *General Manual*, supra note 117, tit. 190, pt. 414, subpt. A, § 414.1; see also U.S. DEP'T OF AGRIC., supra note 182; NAT'L INVASIVE SPECIES COUNCIL, supra note 182; *Invasive and Noxious Weeds*, U.S. DEP'T OF AGRIC., <http://plants.usda.gov/java/noxiousDriver> (last visited Jan. 30, 2011).

191. *General Manual*, supra note 117, tit. 190, pt. 414, subpt. D, § 414.30(A).

192. *GREET Model*, ARGONNE NAT'L LAB., <http://greet.es.anl.gov/> (last updated Aug. 26, 2010).

193. U.S. Dep't of Agric., *Introduction*, COMET-VR, <http://www.cometvr.colostate.edu/> (last visited Jan. 30, 2011).

194. NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., CSP WORKSHEET—AIR QUALITY ENHANCEMENT ACTIVITIES: CARBON SEQUESTRATION SCENARIO EXAMINATION 1 (2006), [http://www.mn.nrcs.usda.gov/programs/csp/2006/jobsheets/air/COMET-VR\\_Enhancement.pdf](http://www.mn.nrcs.usda.gov/programs/csp/2006/jobsheets/air/COMET-VR_Enhancement.pdf).

195. See OFFICE OF POLICY & INT'L AFFAIRS, U.S. DEP'T OF ENERGY, TECHNICAL GUIDELINES: VOLUNTARY REPORTING OF GREENHOUSE GASES (1605(B)) PROGRAM 213–14 (2007), [http://www.eia.doe.gov/oiaf/1605/January2007\\_1605bTechnicalGuidelines.pdf](http://www.eia.doe.gov/oiaf/1605/January2007_1605bTechnicalGuidelines.pdf). The Voluntary Reporting of Greenhouse Gases Program was established by section 1605 of the Energy Policy Act of 1992. Pub. L. No. 102-486, § 1605, 106 Stat. 2776, 3002–03 (codified at 42 U.S.C. § 13,385 (2006)).

196. *The CQESTR Model*, AGRIC. RESEARCH SERV., U.S. DEP'T OF AGRIC., <http://www.ars.usda.gov/Research/docs.htm?docid=13499> (last modified Feb. 3, 2011).

el, C-Farm, has been developed by university researchers.<sup>197</sup> Although not currently integrated, NRCS will likely link its erosion and soil quality models with COMET-VR to enhance accuracy of carbon flux measurements.

Limiting water use and pollutant discharges to water bodies also is an essential element of agricultural sustainability. From a water quality perspective, energy biomass cropping can offer solutions to problems in watersheds surrounded by agricultural production, except, for example, in cases when excess residue removal causes soil erosion, or over application of agrochemicals. NRCS maintains special procedures to identify agricultural sources of nonpoint pollution, and once identified, incorporates management practices into new or existing conservation planning. The *National Water Quality Handbook* guides NRCS personnel in assessing and monitoring water quality concerns, and incorporating knowledge gained into conservation planning.<sup>198</sup> NRCS has developed a set of practice standards for nutrient and pesticide application management, and maintains a *Handbook for Comprehensive Nutrient Planning*.<sup>199</sup> Two risk assessment tools, the Windows Pesticide Screening Tool (WIN-PST) and National Agricultural Pesticide Risk Analysis (NAPRA), are referenced in NRCS practice standards.<sup>200</sup> Although not used at the individual producer level, USDA uses the Soil and Water Assessment Tool (SWAT) to gauge the effectiveness of its conservation programs as part of its Conservation Effects Assessment Project (CEAP).<sup>201</sup> CEAP results likely will be useful to policymakers in developing sustainability regimes for biomass that improve water quality within watersheds.

Water use in all aspects of commodity agriculture is becoming a constraint in light of drought, aquifer depletion from irrigation, and increased urban needs. Some biomass crops may require amounts of water equal to or exceeding other commodity crops' needs, and therefore will

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197. Armen R. Kemanian & Claudio O. Stöckle, *C-Farm: A Simple Model to Evaluate the Carbon Balance of Soil Profiles*, 32 EUR. J. AGRONOMY 22 (2010).

198. NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., NATIONAL WATER QUALITY HANDBOOK § 614.0101 (2003), [http://www.wsi.nrcs.usda.gov/products/W2Q/water\\_qual/docs/NatWQhandbookNRCS.pdf](http://www.wsi.nrcs.usda.gov/products/W2Q/water_qual/docs/NatWQhandbookNRCS.pdf) (defining water quality as "the physical, chemical, and biological composition of water as related to its intended use for such purposes as drinking, recreation, irrigation, and fisheries").

199. *Handbooks*, *supra* note 1, tit. 190, pt. 620, subpt. B.

200. NATURAL RES. CONSERVATION SERV., *supra* note 14, § 509.11. For an analysis of how the NAPRA model is applied to corn ethanol production, see Mark A. Thomas et al., *Water Quality Impacts of Corn Production to Meet Biofuel Demands*, 135 J. ENVTL. ENGINEERING 1123 (2009), see also NATURAL RES. CONSERVATION SERV., WIN-PST 3.1: USER HELP (2008), [http://www.wsi.nrcs.usda.gov/products/w2q/pest/docs/WIN-PST\\_3.1\\_User\\_Help.pdf](http://www.wsi.nrcs.usda.gov/products/w2q/pest/docs/WIN-PST_3.1_User_Help.pdf); *Windows Pesticide Screening Tool WIN-PST 3.1*, NATURAL RES. CONSERVATION SERV., <http://www.wsi.nrcs.usda.gov/products/w2q/pest/winpst31.html> (last visited Jan. 30, 2011).

201. P.W. Gassman et al., *The Soil and Water Assessment Tool: Historical Development, Applications, and Future Research Directions*, 50 TRANSACTIONS AM. SOC'Y AGRIC. & BIOLOGICAL ENGINEERS 1211, 1214–15 (2007); SOIL & WATER ASSESSMENT TOOL (SWAT), <http://swatmodel.tamu.edu/> (last visited Jan. 30, 2011); see also SOIL & WATER CONSERVATION SOC'Y, CONSERVATION EFFECTS ASSESSMENT PROJECT 9 (2006), [http://www.swcs.org/documents/filelibrary/advocacy\\_publications/CEAP\\_Final\\_Report.pdf](http://www.swcs.org/documents/filelibrary/advocacy_publications/CEAP_Final_Report.pdf).

not escape scrutiny under sustainability standards. It could be argued that for a bioenergy crop to be “sustainable,” such crops should not require irrigation or otherwise use copious amounts of water to be high-yielding. With regard to irrigation, NRCS maintains practice standards to optimize use of irrigation water.<sup>202</sup>

Although ecosystem-level modeling of biodiversity<sup>203</sup> in bioenergy-cropped landscapes is in its very nascent stages, NRCS’s National Biology Handbook (NBH) is used to examine fish and wildlife habitats and devises ways, through the National Conservation Partnership, in which to incorporate biodiversity considerations generally into conservation management planning.<sup>204</sup> Although the NBH recognizes the value of perennial grasses in corridors and buffer strips, it does not elaborate on the role of larger-scale energy biomass cropping in biodiversity enhancement. NRCS also funds the Agricultural Wildlife Conservation Center (AWCC) to research habitat needs on agricultural lands and develop conservation technologies, which in turn can be considered in producers’ conservation management planning and practices.<sup>205</sup> The AWCC maintains many publications to assist producers in conserving and building fish and wildlife habitat.<sup>206</sup>

#### IV. AGRO-ENVIRONMENTAL SUBSIDY PROGRAMS AS A SCORE-CARD FOR BIOMASS SUSTAINABILITY

Two options for increased environmental sustainability in agriculture historically have dominated U.S. agricultural policy—retiring lands for conservation purposes and incentivizing changes to existing agricultural practices.<sup>207</sup> Over the past two decades, land retirement has received the majority of federal funding.<sup>208</sup> The 2002 Farm Bill, however, signaled a new focus on achieving sustainability while keeping land in agricultural production.<sup>209</sup> Although perhaps more cost effective, re-

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202. See, e.g., NATURAL RES. CONSERVATION SERV., IRRIGATION WATER MANAGEMENT (AC): CODE 449 (Feb. 2005), <ftp://ftp-fc.sc.egov.usda.gov/NHQ/practice-standards/standards/449.pdf>.

203. Biological diversity (“biodiversity”) “is the variety of all these living things and their interactions.” ALFONSO ALONSO, SMITHSONIAN INST. MONITORING & ASSESSMENT OF BIODIVERSITY PROGRAM, BIODIVERSITY: CONNECTING WITH THE TAPESTRY OF LIFE 4 (2001), <http://www.nrcs.usda.gov/technical/ECS/wildlife/primermredres.pdf>. “Scientists often speak of three levels of diversity—species, genetic and ecosystem diversity. In effect, these levels cannot be separated. Each is important, interacting with and influencing the others. A change at one level can cause changes at the other levels.” *Id.*

204. *National Biology Handbook, Aquatic and Terrestrial Habitat Resources*, NATURAL RES. CONSERVATION SERV., available at <http://www.nrcs.usda.gov/technical/biology.html> (last updated Sept. 16, 2010).

205. U.S. DEP’T OF AGRIC., ABOUT THE AGRICULTURAL WILDLIFE CONSERVATION CENTER PROJECTS (n.d.), <ftp://ftp-fc.sc.egov.usda.gov/WHMI/WEB/aboutawccprojects.pdf>.

206. U.S. DEP’T OF AGRIC. RESOURCES, PUBLICATIONS, TOOLS, INPUT FROM AWCC (n.d.), <ftp://ftp-fc.sc.egov.usda.gov/WHMI/WEB/resources.pdf>.

207. See generally Hongli Feng et al., *Environmental Conservation in Agriculture: Land Retirement vs. Changing Practices on Working Land*, 52 J. ENVTL. ECON. & MGMT. 600 (2006).

208. *Id.* at 600.

209. *Id.*

searchers only are beginning to explore the environmental tradeoffs between idling land for conservation and conservation through management practices.<sup>210</sup>

In addition to BCAP, which subsidizes energy biomass production if produced pursuant to a conservation plan, energy biomass producers may receive additional federal assistance by participating in “working lands” environmental enhancement programs such as the CSP, the EQIP, and WHIP. The CRP also contains a mechanism for evaluating the potential environmental benefits of idling agricultural land while accommodating a certain level of biomass harvests. The new suite of working lands conservation programs, as well as the more well-developed CRP protocols, conceivably provide policymakers an option for “grading” biomass sustainability. These programs contain assessment mechanisms and indicators that could initially provide a stand-alone sustainability framework while the biomass industry develops economically, and scientific research more fully grasps the environmental benefits (and perhaps harms) of energy biomass cropping. Or, sustainability metrics within existing agro-environmental programs could inform individual criteria and metrics development for NRCS or in emerging biomass-specific standards.

#### A. *The Conservation Stewardship Program (CSP)*

The CSP began as the Conservation Security Program, enacted as part of the 2002 Farm Bill.<sup>211</sup> The 2008 Farm Bill changed the name of

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210. *Id.* at 600–01.

211. Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, sec. 2001(a), § 1238A, 116 Stat. 134, 225–30 (codified as amended at 16 U.S.C. § 3838a (2006 & Supp. III 2010), *amended by* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 2301(b)–(c), 122 Stat. 1651, 1775–76 (codified at 16 U.S.C. § 3838a(b)(3)(C), (g))). The program’s overall goal was to encourage conservation practices beneficial to:

- (A) nutrient management;
- (B) integrated pest management;
- (C) water conservation (including through irrigation) and water quality management;
- (D) grazing, pasture, and rangeland management;
- (E) soil conservation, quality, and residue management;
- (F) invasive species management;
- (G) fish and wildlife habitat conservation, restoration, and management;
- (H) air quality management;
- (I) energy conservation measures;
- (J) biological resource conservation and regeneration;
- (K) contour farming;
- (L) strip cropping;
- (M) cover cropping;
- (N) controlled rotational grazing;

the program to the CSP and made several substantive changes.<sup>212</sup> The CSP provides funding through 2012 for producers to both improve existing and incorporate new conservation practices into their operations.<sup>213</sup> NRCS allocates each year's acreage by land use.<sup>214</sup> The majority of the operation's land must be in a watershed.<sup>215</sup> Monies are now available nationwide<sup>216</sup> through continuous sign-up periods in which NRCS ranks proposals through a point-scoring process.<sup>217</sup> Top-ranked projects re-

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- (O) resource-conserving crop rotation;
  - (P) conversion of portions of cropland from a soil-depleting use to a soil-conserving use, including production of cover crops;
  - (Q) partial field conservation practices;
  - (R) native grassland and prairie protection and restoration; and
  - (S) any other conservation practices that the Secretary determines to be appropriate and comparable to other conservation practices described in this paragraph.

*Id.* sec. 2001(a), § 1238A(d)(4), at 227 (codified at 16 U.S.C. § 3838a(d)(4)). Direct payments and technical assistance for these practices, however, were only available in certain watersheds designated by NRCS. *Id.* sec. 2001(a), § 1238A(b), at 225–26 (codified at 16 U.S.C. § 3838a(b), *amended by* Food, Conservation, and Energy Act sec. 2301(c), 122 Stat. at 1776 (codified at 16 U.S.C. § 3838a(b)(3)(C))). Producers enrolled in the original CSP received payments while maintaining land in agricultural production, based on a three-tiered payment system subject to maximum annual payment caps and contract terms varying between five and ten years. *Id.* sec. 2001(a), § 1238A(d)(5), at 227–28 (codified at 16 U.S.C. § 3838a(d)(5)). In return for payment, producers agreed to conserve at least one resource concern (e.g., water, air, soil) on at least a portion of the enrolled acreage, or for increased payment, one or more additional measures on all areas of production. *Id.* Enhanced payments were available for, among other practices, participation in a regional conservation plan and assessment of conservation practices. *Id.* sec. 2001(a), § 1238A(b)(1), at 225 (codified at 16 U.S.C. § 3838a(b)(1)). Producers were required to submit a “conservation security plan” approved by NRCS that identified enrolled acreage, conservation practices, and an implementation schedule. *Id.* sec. 2001(a), § 1238A(c), at 226 (codified at 16 U.S.C. § 3838a(c)). Producers did not compete for funding; instead, if the producer met the program standards, the land would be eligible for payment. *Id.* sec. 2001(a), § 1238A(b), at 225–26 (codified at 16 U.S.C. § 3838a(b), *amended by* Food, Conservation, and Energy Act sec. 2301(b), 122 Stat. at 1775–76 (codified at 16 U.S.C. § 3838a(b)(3)(C))).

212. Food, Conservation, and Energy Act sec. 2301(a)(2), 122 Stat. 1651, 1768–76 (codified at 7 U.S.C. §§ 3838d–3838g (Supp. III 2010)).

213. *Id.* sec. 2301(a)(2), § 1238E(a), at 1769 (codified at 7 U.S.C. § 3838e(a)).

214. For 2009, 40% of payments go to cropland, 7% to pastureland, 45% to rangeland, and 8% to non-industrial private forestland. *Payment for Performance: Conservation Stewardship Program*, NATURAL RES. CONSERVATION SERV. (Jan. 2010), [http://www.nrcs.usda.gov/programs/pdf\\_files/One\\_Pager\\_Payment\\_Setting\\_012010\\_Final.pdf](http://www.nrcs.usda.gov/programs/pdf_files/One_Pager_Payment_Setting_012010_Final.pdf).

215. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238G(a)(2), 122 Stat. at 1773 (codified at 16 U.S.C. § 3838g(a)(2)); *see also Manuals*, *supra* note 119, tit. 440, pt. 518, subpt. E, § 518.42(B).

216. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238G(a), 122 Stat. at 1773 (codified at 16 U.S.C. § 3838g(a)). Congress limits priority resource concern designation in each state to between three and five resource concerns, depending on the number of agricultural acres, the conservation needs, and the program's ability to meet those needs in each state, as well as other equitable factors. *Id.* sec. 2301(a)(2), § 1238G(a)(2), at 1773 (codified at 16 U.S.C. § 3838g(a)(2)). Under the prior Conservation Security Program, monies were only available in select watersheds. For a map of eligible fiscal year 2008 watersheds, see *Conservation Security Program (CSP) Watersheds, FY-2008*, NATURAL RES. CONSERVATION SERV., [http://www.nrcs.usda.gov/programs/CSP/CSP\\_2008/2008\\_CSP\\_WS.html](http://www.nrcs.usda.gov/programs/CSP/CSP_2008/2008_CSP_WS.html) (last visited Jan. 30, 2011).

217. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238F(b), 122 Stat. at 1771 (codified at 16 U.S.C. § 3838f(b)); *Manuals*, *supra* note 119, tit. 440, pt. 518, subpt. E, § 518.40.

ceive CSP funding.<sup>218</sup> Producers cannot receive CSP payments for services already reimbursed under the CRP, GRP, or WRP, or for newly converted land except under certain circumstances.<sup>219</sup> NRCS estimates total program costs over ten years at \$12 billion.<sup>220</sup>

Unlike the previous CSP that rewarded projects using a tiered system, project proposals under the new CSP compete on additionality.<sup>221</sup> That is, in order to qualify for payment, producers must meet a “stewardship threshold” for one “resource concern” at the time of contract, maintain those practices to support that threshold, and meet or exceed an additional priority stewardship threshold for one additional resource concern by the end of the five-year contract period (“enhancements”).<sup>222</sup> A “stewardship threshold” is the level of management necessary to “conserve and improve the quality and condition of a natural resource.”<sup>223</sup> State conservationists, in consultation with the State Technical Committee and local working groups, identify priority resource concerns for a state, or a specific geographic area within the state, that relate to water quality and quantity, soil quality, air quality, and wildlife habitat.<sup>224</sup> If eligible, producers can receive payment for costs incurred, foregone income, and the environmental benefits they provide.<sup>225</sup> Producers also can receive supplemental payments for resource-conserving crop rotation,<sup>226</sup>

218. The statute requires payments per acre to average a maximum of \$18, which includes both the annual payment and NRCS technical assistance. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238G(d), 122 Stat. at 1774 (codified at 16 U.S.C. § 3838g(d)). Producers are required to obtain payment and have a record in the FSA farm management system that contains information on, among other things, baseline eligibility in relation to HEL and wetland conservation requirements. Each producer may receive up to \$40,000 in CSP payment. *Id.* sec. 2301(a)(2), § 1238G(g), at 1775 (codified at 16 U.S.C. § 3838g(g)).

219. *Id.* sec. 2301(a)(2), § 1238E(c), at 1770 (codified at 16 U.S.C. § 3838e(c)). Also excluded are costs for animal waste treatment systems, or activities for which the producer incurs no costs. *Id.* sec. 2301(a)(2), § 1238G(e)(3), at 1774 (codified at 16 U.S.C. § 3838g(e)(3)).

220. *Conservation Stewardship Program*, NAT'L SUSTAINABLE AGRIC. COAL., <http://sustainableagriculture.net/publications/grassrootsguide/conservation-environment/conservation-stewardship-program/> (last visited Jan. 30, 2011).

221. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238E(a)(1), 122 Stat. at 1769 (codified at 16 U.S.C. § 3838e(a)(1)).

222. *Id.* sec. 2301(a)(2), § 1238F(a), at 1770–71 (codified at 16 U.S.C. § 3838f(a)); Conservation Stewardship Program, 75 Fed. Reg. 31,610, 31,657 (June 3, 2010) (to be codified at 7 C.F.R. § 1470.20(b)).

223. Conservation Stewardship Program, 75 Fed. Reg. at 31,656 (to be codified at 7 C.F.R. § 1460.3).

224. *Id.* at 31,653–54 (to be codified at 7 C.F.R. § 1470.1(e)(1)). The statute defines “resource concerns” as a “specific natural resource impairment or problem . . . that—(A) represents a significant concern in a State or region; and (B) is likely to be addressed successfully through the implementation of conservation activities.” Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238D(6), 122 Stat. at 1769 (codified at 16 U.S.C. § 3838d(6)).

225. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238G(e)(2), 122 Stat. at 1774 (codified at 16 U.S.C. § 3838g(e)(2)). NRCS’s formula for the annual land use portion of the award takes the number of acres, multiplied by existing and new activity performance points, multiplied by the land use payment rate. NRCS sets payment rates yearly for each performance point. *Manuals, supra* note 119, tit. 440, pt. 518, subpt. I, §§ 518.80–81.

226. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238G(f), 122 Stat. at 1774–75 (codified at 16 U.S.C. § 3838g(f)). The crop must reduce erosion, improve soil fertility and health, interrupt pest cycles, and reduce depletion of soil moisture or otherwise reduce the need for irrigation. *Id.* sec.

as well as participation in on-farm research, demonstration, and pilot testing.<sup>227</sup> The producer has an option to renew a CSP contract, but must show that an additional priority resource concern is being met and “agree to adopt additional conservation activities to address at least one additional priority resource concern during the term of the renewed conservation stewardship contract.”<sup>228</sup>

The state conservationist or his or her designate ranks project applications using the Conservation Measurement Tool (CMT).<sup>229</sup> The CMT determines a project’s “conservation performance” using a point system that measures “relative physical” effects instead of “true environmental benefits.”<sup>230</sup> During the first sign-up period in 2009, a NRCS panel of experts developed a set of questions to evaluate existing practices and to score practices that would lead to additional enhancements.<sup>231</sup> Project applications are ranked on five factors:

- (i) Level of conservation treatment on all applicable priority resource concerns at the time of application,
- (ii) Degree to which the proposed conservation treatment on applicable priority resource concerns effectively increases conservation performance,
- (iii) Number of applicable priority resource concerns proposed to be treated to meet or exceed the stewardship threshold by the end of the contract, . . .
- (iv) Extent to which other resource concerns, in addition to priority resource concerns, will be addressed to meet or exceed the stewardship threshold by the end of the contract period; . . .  
[and]  
[(v)][L]east cost.<sup>232</sup>

The NRCS website contains CMT questionnaires (e.g., for crops or forestland) that solicit information on rotations, variety of crops, flooding for wildlife, cover cropping, harvesting techniques that are favorable to

2301(a)(2), § 1238G(f)(4), at 1775 (codified at 16 U.S.C. § 3838g(f)(4)). “Resource conserving crops” include perennial grasses, “a legume grown as use for forage, seed for planting, or green manure,” a legume-grass mixture, and “a small grain grown in combination with a grass or legume whether interseeded or planted in rotation.” Conservation Stewardship Program, 75 Fed. Reg. at 31,655 (to be codified at 7 C.F.R. § 1470.3).

227. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238F(i), 122 Stat. at 1773 (codified at 16 U.S.C. § 3838f(i)).

228. Conservation Stewardship Program, 75 Fed. Reg. at 31,660 (to be codified at 7 C.F.R. § 1470.26(b)(3)–(4)).

229. *Id.* at 31,657 (to be codified at 7 C.F.R. § 1470.20(c)(2)).

230. Food, Conservation, and Energy Act sec. 2301(a)(2), § 1238F(b)(1)(B), 122 Stat. at 1771 (codified at 16 U.S.C. § 3838f(b)(1)(B)); *id.* sec. 2301(a)(2), § 1238G(a)(3), at 1773 (codified at 16 U.S.C. § 3838g(a)(3)); Conservation Stewardship Program, 75 Fed. Reg. at 31,617.

231. Conservation Stewardship Program, 75 Fed. Reg. at 31,614.

232. *Id.* at 31,657–58 (to be codified at 7 C.F.R. § 1470.20(c)(2)–(3)). For a detailed explanation and evaluation of the CMT, see NATURAL RES. CONSERVATION SERV., U.S. DEP’T OF AGRIC., FINAL COST-EFFECTIVENESS ANALYSIS FOR THE CONSERVATION STEWARDSHIP PROGRAM (2010), [http://www.nrcs.usda.gov/programs/farmbill/2008/bca-cria/CSP\\_BCA-FINAL\\_5-14-10.pdf](http://www.nrcs.usda.gov/programs/farmbill/2008/bca-cria/CSP_BCA-FINAL_5-14-10.pdf).

wildlife, other habitat-friendly practices, water conservation and residue management strategies, nutrient and pest management, and irrigation management.<sup>233</sup> The NRCS website also contains a list of “enhancement activity job sheets” that span a variety of conservation practices.<sup>234</sup> As a condition of CSP funding, the producer must implement a conservation stewardship plan that follows the general NPPH process.<sup>235</sup> The conservation stewardship plan contains a description and implementation schedule for “benchmark” enhancement activities, new enhancement activities, and new conservation practices.<sup>236</sup> Where new technology exists that “show[s] a high potential for optimizing environmental benefits” (which is likely in an energy biomass production scenario, if done correctly), NRCS may approve a CSP payment for the practice until a practice standard can be developed.<sup>237</sup> NRCS has reserved a section in its CSP handbook for “environmental performance analysis,” presumably as part of recent efforts to better evaluate the performance of conservation programs.<sup>238</sup>

### B. *The Environmental Quality Incentives Program (EQIP)*

When a producer does not reach the threshold requirements for the CSP program, EQIP monies may be available. Congress created EQIP in 1996 to incentivize agricultural and forest producers to provide increased environmental benefits through direct financial payments and NRCS technical assistance.<sup>239</sup> NRCS administers the program through state conservationists.<sup>240</sup> EQIP is based on national resource priorities that include reduction in nonpoint source water pollution, air pollution, and soil erosion, as well as promotion of habitat conservation for “at-risk species.”<sup>241</sup> These goals are incorporated into conservation management

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233. *Conservation Measurement Tool: Cropland Existing Activity Conservation Performance*, NATURAL RES. CONSERVATION SERV. (Apr. 19, 2010), [http://www.nrcs.usda.gov/programs/new\\_csp/2010/ranking\\_period\\_two/cmt\\_questions\\_pdfs/CMT\\_Tool\\_Cropland\\_4\\_19\\_10.pdf](http://www.nrcs.usda.gov/programs/new_csp/2010/ranking_period_two/cmt_questions_pdfs/CMT_Tool_Cropland_4_19_10.pdf) (cropping questionnaire); *Conservation Stewardship Program: FY 2010 Ranking Period Two*, NATURAL RES. CONSERVATION SERV., [http://www.nrcs.usda.gov/programs/new\\_csp/csp.html](http://www.nrcs.usda.gov/programs/new_csp/csp.html) (last updated Jan. 25, 2011) (listing all of the questionnaires).

234. *Conservation Stewardship Program Introduction: 2010 Ranking Period Two Enhancement Activity Job Sheets*, NATURAL RES. CONSERVATION SERV., [http://www.nrcs.usda.gov/programs/new\\_csp/2010\\_jobsheets-rp-two.html](http://www.nrcs.usda.gov/programs/new_csp/2010_jobsheets-rp-two.html) (last updated July 12, 2010).

235. Conservation Stewardship Program, 75 Fed. Reg. at 31,658 (to be codified at 7 C.F.R. §§ 1470.21(b)(4)(i), 1470.22).

236. *Manuals*, *supra* note 119, tit. 440, pt. 518, subpt. H, § 518.70(B).

237. *Id.* tit. 440, pt. 518, subpt. H, § 518.71(B); *see also supra* note 147 (explaining the procedure in the NHCP for adding new practices).

238. *Id.* tit. 440, pt. 518, subpt. O, § 581.141; *see also infra* Part V (evaluation of whether NRCS conservation programs have been effective).

239. Federal Agriculture Improvement and Reform Act of 1996, Pub. L. No. 104-127, sec. 334, § 1240, 99 Stat. 888, 997 (codified at 16 U.S.C. § 3839aa (2006)), *amended by* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 2501(a), 122 Stat. 1651, 1785–86 (codified at 16 U.S.C. § 3839aa (Supp. III 2010)); *see also* Commodity Credit Corporation, 74 Fed. Reg. 2293 (Jan. 15, 2009) (codified at 7 C.F.R. pt. 1466 (2010)).

240. 7 C.F.R. § 1466.5 (2010).

241. *Id.* § 1466.4(a).

planning and implementation and are enforced through a contract with a maximum duration of ten years.<sup>242</sup> Forty percent of EQIP funding is available for nonlivestock related practices.<sup>243</sup> Payments may not exceed \$300,000 per entity.<sup>244</sup>

NRCS scores both EQIP and WHIP projects using Application and Evaluation and Ranking Tool criteria specific to each program.<sup>245</sup> Projects receive funding based on state conservationist rankings of cost-effectiveness, the magnitude and longevity of environmental benefits, compliance with all laws, timeliness in implementing the practices, and improvement of existing conservation practices.<sup>246</sup>

### C. *The Wildlife Habitat Incentives Program (WHIP)*

Congress created WHIP to assist agricultural producers, through a cost-share program valued at up to \$50,000 per year per producer,<sup>247</sup> in creating habitat for upland and wetland wildlife, endangered and threatened species, fish, and other priority habitat.<sup>248</sup> The state conservationist, in consultation with the State Technical Committee, is charged with implementing the program.<sup>249</sup> NRCS can enter into agreements with local agencies and private conservation groups to implement the program and can set species and geographical priorities each year.<sup>250</sup> “General” WHIP funding (up to seventy-five percent of the cost of installing the conservation practice(s)) is available for projects lasting between five and ten years that develop habitat.<sup>251</sup> Funding for longer-term projects (up to ninety percent cost-share for up to fifteen years) is available for projects that protect and restore plants and habitat.<sup>252</sup> The 2010 payment sche-

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242. *Id.* §§ 1466.8(a), .9, .21(b)(2).

243. *See id.* § 1466.8(d).

244. *Id.* § 1466.24(a).

245. *Manuals, supra* note 119, tit. 440, pt. 512, subpt. C, § 512.20(D).

246. Commodity Credit Corporation, 7 C.F.R. §§ 1466.20, 1466.21(b)(3); *see also, e.g., Environmental Quality Incentives Program (EQIP)*, ILL. NATURAL RES. CONSERVATION SERV., <http://www.il.nrcs.usda.gov/programs/eqip/index.html> (last updated Dec. 15, 2010).

247. Wildlife Habitat Incentive Program Correction, 74 Fed. Reg. 10,673, 10,674 (interim Mar. 12, 2009) (to be codified at 7 C.F.R. § 636.7(f)); 7 C.F.R. § 636.6(d) (2009), *superseded by* Wildlife Habitat Incentive Program, 74 Fed. Reg. 2786 (interim Jan. 16, 2009) (to be codified at 7 C.F.R. pt. 636). The producer is eligible for up to 75% of the project cost, except that the payment is reduced if the producer receives other funding directly from the federal government. Wildlife Habitat Incentive Program, 74 Fed. Reg. at 2797–98 (to be codified at 7 C.F.R. 636.7(a)(1)). For projects that achieve benefits longer than fifteen years, the statute provides for increased funding above this cap. 16 U.S.C. § 3839bb-1(b)(2)(A) (2006).

248. 16 U.S.C. § 3839bb-1, *amended by* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 2602, 122 Stat. 1651, 1796 (codified at 16 U.S.C. §§ 3839bb-1 (Supp. III 2010)); Wildlife Habitat Incentive Program, 74 Fed. Reg. at 2786 (to be codified at 7 C.F.R. pt. 636), *amended by* Wildlife Habitat Incentive Program Correction, 74 Fed. Reg. at 10,674.

249. Wildlife Habitat Incentive Program, 74 Fed. Reg. at 2795 (to be codified at 7 C.F.R. § 636.2(b)).

250. *Id.* at 2795, 2797 (to be codified at 7 C.F.R. §§ 636.2(c)–(d), 636.6(a)).

251. *Id.* at 2797–98 (to be codified at 7 C.F.R. §§ 636.7, 636.9(b)).

252. Up to 25% of total WHIP funding is available for these types of projects. 16 U.S.C. § 3839bb-1(b)(2)(B) (2006 & Supp. III 2010), *amended by* Food, Conservation, and Energy Act sec.

dule for WHIP practices includes cover cropping and plant species for pollinators.<sup>253</sup>

NRCS selects projects by ranking them according to whether they address an identified local, state, or national habitat problem, their relationship to established conservation or wildlife areas, the expected length of benefits proposed by the project, whether the project can be self-sustaining, the availability of matching funding, the estimated cost of the project, and any other appropriate factors determined by NRCS.<sup>254</sup> Both national issues and state-specific issues are identified in the ranking process.<sup>255</sup> If chosen, participants must develop a wildlife habitat development plan, part of which is accomplished through the general NRCS planning process outlined above.<sup>256</sup>

#### D. *The Conservation Reserve Program (CRP)*

The CRP, established by the 1985 Farm Bill, is the largest conservation program in the United States by acreage and expenditures.<sup>257</sup> The CRP aims to “conserve and improve soil, water and wildlife resources,” and Congress has expressed a desire that the three be equitably balanced.<sup>258</sup> Land eligible for the program include HELs, certain marginal pastureland converted to wetlands or wildlife habitat, marginal pastureland devoted to water quality uses, and other type of lands that are otherwise ineligible that would provide types of environmental benefits.<sup>259</sup> Congress has capped the total number of eligible acres at 32 million between 2010 and 2012,<sup>260</sup> and no more than thirty-three percent of land within any state can be CRP land.<sup>261</sup> Contracts pay an annual rent and

2602(c), 122 Stat. at 1796 (codified at 16 U.S.C. §§ 3839bb-1(b)(2)(B)); Wildlife Habitat Incentive Program, 74 Fed. Reg. at 2798 (to be codified at 7 C.F.R. § 636.9(c)); *see also* NATURAL RES. CONSERVATION SERV., FACT SHEET: WILDLIFE HABITAT INCENTIVE PROGRAM (Mar. 2009), [http://www.nrcs.usda.gov/programs/farmbill/2008/pdfs/whip\\_factsheet.pdf](http://www.nrcs.usda.gov/programs/farmbill/2008/pdfs/whip_factsheet.pdf).

253. *See, e.g.*, ILLINOIS BULLETIN NO. IL 300-10-11, ILL. NATURAL RES. CONSERVATION SERV. (Jan. 21, 2010), *available at* <http://www.il.nrcs.usda.gov/intranet/nrcsemp/bulletins/FY2010/il300-10-11.html> (follow “ILB300-10-11att WHIP payment schedule Essential-HU 1-21-2010.xls” hyperlink).

254. Wildlife Habitat Incentive Program, 74 Fed. Reg. at 2797 (to be codified at 7 C.F.R. § 636.5(c)).

255. *See, e.g.*, NATURAL RES. CONSERVATION SERV., U.S. DEP’T OF AGRIC., GENERAL HABITAT: RANKING CRITERIA (May 21, 2009), [ftp://ftp-fc.sc.egov.usda.gov/IL/farmbill/WHIPrank-Gen\\_0509.pdf](ftp://ftp-fc.sc.egov.usda.gov/IL/farmbill/WHIPrank-Gen_0509.pdf).

256. Wildlife Habitat Incentive Program, 74 Fed. Reg. at 2798 (to be codified at 7 C.F.R. § 636.8).

257. Food Security Act of 1985, Pub. L. No. 99-198, § 1231, 99 Stat. 1354, 1509 (codified as amended at 16 U.S.C. § 3831 (2006) (for further amendments *see supra* note 109)); *see also* Marc O. Ribauto et al., *Environmental Indices and the Politics of the Conservation Reserve Program*, 1 ECOLOGICAL INDICATORS 12 (2001).

258. 16 U.S.C. § 3831(a), (j) (2006 & Supp. III 2010), *amended by* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, secs. 2101, 2106(a)(2)(B), 122 Stat. 1651, 1756, 1760 (codified at 16 U.S.C. § 3831(a), (i)) (*inter alia*, redesignated former subsection (j) as subsection (i)).

259. 16 U.S.C. § 3831(b)(4)(A)–(E), *amended by* Food, Conservation, and Energy Act sec. 2102, 122 Stat. at 1756 (codified at 16 U.S.C. § 3831(b)(4)(C)–(E)).

260. 16 U.S.C. § 3831(d), *amended by* Food, Conservation, and Energy Act sec. 2103, 122 Stat. at 1756–57 (codified at 16 U.S.C. § 3831(d)).

261. 7 C.F.R. § 1410.8(b) (2010).

half the cost of establishing permanent land cover, and last between ten and fifteen years.<sup>262</sup> NRCS can designate priority areas for funding if significant adverse air, water, wildlife, or other resource issues related to agriculture exist.<sup>263</sup> Producers can either submit applications for the continuous sign-up program (for “environmentally desirable land”) or general sign-up.<sup>264</sup>

The CRP program could serve as an informative model for biomass sustainability standard development, as it contains an assessment mechanism, indicators, and management planning component.<sup>265</sup> As with BCAP rules regarding conservation planning, producers enrolled in the CRP must prepare a conservation plan approved by CCC according to CCC guidelines.<sup>266</sup> The regulations do not specifically reference those guidelines as separate from those maintained by NRCS, discussed below. Project applications submitted during a general sign-up period (the last one was held in 2006) are ranked by the Farm Service Agency (FSA) according to an Environmental Benefits Index.<sup>267</sup> Not unlike the CMT for the CSP, FSA assigns each chosen environmental factor a point score.<sup>268</sup> In 2006, the factors included:

- Wildlife habitat benefits resulting from covers on contract acreage . . . ;
- Water quality benefits from reduced erosion, runoff, and leaching . . . ;
- On-farm benefits from reduced erosion . . . ;
- Benefits that will likely endure beyond the contract period . . . ;
- Air quality benefits from reduced wind erosion . . . ; and
- Cost . . . .<sup>269</sup>

FSA assigns increased value to cover crops that provide the most benefits to wildlife, particularly native mixes and designated wildlife priority zones.<sup>270</sup> It is unclear what methodology is used to assign values to these environmental benefits. To gain certain wildlife habitat points, the producer must prepare a wildlife conservation plan.<sup>271</sup>

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262. 16 U.S.C. § 3831(e)(1) (2006).

263. 7 C.F.R. § 1410.8(c).

264. *Conservation Programs*, FARM SERV. AGENCY, <http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp> (last modified Jan. 21, 2011).

265. Ribaud et al., *supra* note 257, at 12.

266. 7 C.F.R. § 1410.22.

267. FARM SERV. AGENCY, U.S. DEP'T OF AGRIC., FACT SHEET: CONSERVATION RESERVE PROGRAM GENERAL SIGN-UP 33 ENVIRONMENTAL BENEFITS INDEX (2006), [http://www.fsa.usda.gov/Internet/FSA\\_File/crp33ebi06.pdf](http://www.fsa.usda.gov/Internet/FSA_File/crp33ebi06.pdf).

268. *Id.*

269. *Id.* at 1.

270. *Id.* at 1–2.

271. *Id.* at 4.

## V. CONCLUDING THOUGHTS: TOWARD A CREDIBLE, FEASIBLE MEASURE OF BIOMASS SUSTAINABILITY

Bioenergy policies present both challenges and opportunities moving forward in relation to achieving greater levels of agricultural sustainability. Formidable structural problems lie within and between bioenergy legislation. Coordination must improve between and within federal and state agencies, and other standard-setting groups, which are currently developing sustainability policies. Further, new demands for agricultural sustainability, regardless of the cropping system, strain already-taxed agency budgets and require the supporting technical expertise and data that just may not be available yet, even in the best of budgetary times. That said, proliferating bioenergy policies present a unique opportunity to reconsider the path forward despite these shortcomings, not just for energy biomass but for increased sustainability of the agricultural sector as a whole.

First, policymakers must reconcile the definition of “renewable biomass” between RFS2 and BCAP so that first- and second-generation feedstocks are on even and good footing. That is, policies should reward consistently the environmental benefits from perennial versus other commodity cropping.<sup>272</sup> Although corn- and soy-based fuels have benefitted from EPA’s continued refinement of life cycle assessment analyses under RFS2, and similarly under California’s LCFS, USDA did not include any GHG reduction requirements in the final BCAP rule, despite eluding to one in the proposed rule. On the flip side, EPA did not clarify in the 2010 Final RFS2 Rule what, if any, sustainability concerns beyond GHG emissions will be addressed in future rulemaking. Indeed, EPA resisted using sustainability certification as a method of complying with the land conversion proscription in the RFS2 Final Rule.<sup>273</sup> The BCAP Final Rule, on the other hand, requires producers to maintain a conservation plan.<sup>274</sup> If no Title I crops are eligible for BCAP subsidies, but those that are (e.g., perennial grasses) are subject to conservation plan-

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272. For a detailed accounting of the sustainability concerns related to corn production, including ethanol, see Angelo, *supra* note 6, at 654–55; Melissa Powers, *King Corn: Will the Renewable Fuel Standard Eventually End Corn Ethanol’s Reign?*, 11 VT. J. ENVTL. L. 667 (2010). For the concerns related to soy-based biodiesel, see, for example, Otávio Cavalett & Enrique Ortega, *Integrated Environmental Assessment of Biodiesel Production from Soybean in Brazil*, 18 J. CLEANER PRODUCTION 55, 64 (2010) (concluding that “the fraction of the fuel that is actually renewable is very low (around 30%)”); ASEED EUR. ET AL., *THE ROUND TABLE ON IR-RESPONSIBLE SOY: A BRIEFING ON THE IMPACTS OF THE ROUND TABLE ON RESPONSIBLE SOY 3* (2008), [http://www.lasojamata.net/files/RTbriefing%202008\\_6.pdf](http://www.lasojamata.net/files/RTbriefing%202008_6.pdf) (contending that the Roundtable for Responsible Soy criteria “provide a valuable coat of greenwash, legitimising the damaging practice on the ground”).

273. See *supra* text accompanying notes 43–45. A petition has been filed asking EPA to reconsider its “aggregate compliance” rule, arguing that the interpretation does not meet EISA’s strict statutory language, and that land conversion will occur under such regime. See *Petition for Reconsideration, In re Final Rule: Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program*, EPA Docket No. EPA-HQ-OAR-2005-0161 (May 24, 2010), [http://www.catf.us/resources/filings/biofuels/20100521CATF\\_Petition\\_for\\_Reconsideration\\_of\\_RFS2.pdf](http://www.catf.us/resources/filings/biofuels/20100521CATF_Petition_for_Reconsideration_of_RFS2.pdf).

274. See *supra* text accompanying notes 59–62.

ning despite the likelihood that they can provide environmental benefits superior to monocropped corn or soy, those same Title I feedstocks that qualify for RFS2 (albeit up to a 15 billion gallon per-year threshold) should be required to meet minimum sustainability considerations as well.<sup>275</sup>

California has done a better job in making sure that its biomass sustainability policies are consistent between programs through such mechanisms as the A.B. 32 Scoping Plan<sup>276</sup> and Bioenergy Action Plans,<sup>277</sup> which provide an “umbrella” that guides development of all GHG-related bioenergy projects, and interagency groups such as the Interagency Forestry and Bioenergy Working Groups whose meetings and proceedings are open to the public and easily accessible online.<sup>278</sup> Although President Obama created a similar Biofuels Interagency Working Group in 2009, whether or not it has, or will, consider recommendations for consistent sustainability definitions in light of the President’s new “integrated approach” announced in 2010 is unknown, as their inner workings (e.g., meetings, documents) are not readily publically available. The Office of Management and Budget conducts similar analyses when clearing a final rule, but this, too, is not open to public input. Although EPA successfully posted the thousands of comments to its proposed RFS2 rule on the regulations.gov website so that comments could be remotely analyzed, FSA only posted a small portion of the 20,000+ comments to BCAP proposed rule and insufficiently addressed significant public concerns in the Final Rule that were likely contained in those comments.<sup>279</sup> It is this transparency that Professor Doremus advocates to prevent the “scientization of politics” that has plagued climate change policy in the United States.<sup>280</sup>

In the end, if policies begin to attach sustainability requirements to corn and soy production because they, too, are feedstocks for “bio”-fuels, bioenergy policies will have served to improve sustainability within a large portion of the entire agricultural sector—something that other policies have struggled to achieve over the past twenty-five years. But,

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275. See, e.g., Anise Maguire, *Shifting the Paradigm: Broadening Our Understanding of Agriculture and Its Impact on Climate Change*, 33 ENVIRONS ENVTL. L. & POL’Y J. 275, 306–07 (2010) (agreeing that at a minimum, farm subsidies be redesigned to include sustainability requirements for mitigating climate change).

276. CAL. AIR RES. BD., CLIMATE CHANGE SCOPING PLAN: A FRAMEWORK FOR CHANGE, (2008), [http://www.arb.ca.gov/cc/scopingplan/document/adopted\\_scoping\\_plan.pdf](http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf).

277. See Cal. Exec. Order No. S-06-06 (Apr. 25, 2006), available at <http://www.gov38.ca.gov/executive-order/183/> (directing state agencies to cooperate in developing a sustainable biomass plan for California); *Bioenergy Action Plan—Documents Page*, CAL. ENERGY COMM’N, [http://www.energy.ca.gov/bioenergy\\_action\\_plan/documents/index.html](http://www.energy.ca.gov/bioenergy_action_plan/documents/index.html) (last modified Jan. 4, 2011).

278. Cal. Exec. Order No. S-06-06; CAL. BD. OF FORESTRY & FIRE PROT., 2009 CHARTER INTERAGENCY FORESTRY WORKING GROUP ON CLIMATE CHANGE (Apr. 7, 2009), [http://www.bof.fire.ca.gov/board\\_committees/interagency\\_forestry\\_working\\_group/mission\\_and\\_goals/charter/ifwg\\_charter\\_final4-7-09.pdf](http://www.bof.fire.ca.gov/board_committees/interagency_forestry_working_group/mission_and_goals/charter/ifwg_charter_final4-7-09.pdf).

279. See REGULATIONS.GOV, <http://www.regulations.gov> (last visited Jan. 30, 2011).

280. See Holly Doremus, *Science Plays Defense: Natural Resource Management in the Bush Administration*, 32 ECOLOGY L.Q. 249 (2005).

what should sustainability requirements look like? One option would be to require NRCS conservation planning for all agricultural production that receives federal subsidies. As demonstrated in Part III, NRCS has a framework in place for identifying the environmental problems within the landscape, practice standards to address those concerns, and a conservation planning process for producers to implement and assess those practices. This would increase NRCS's workload substantially, however, even from a sheer numbers perspective, at a time when Congress is cutting conservation program funding.<sup>281</sup>

Another hurdle to adoption of the NRCS conservation framework is that NRCS practice standards and models are not yet specific to second-generation crops such as miscanthus or switch grass, except to the extent that cover crop practices can be analogized to the practices and outcomes associated with perennial biomass cropping. In addition, carbon sequestration and GHG emissions are not considered specifically, except to the extent SOM can serve as a proxy. NRCS, therefore, would have to take steps to incorporate, where necessary, new or adjusted practice standards that contribute to carbon sequestration and curtail GHG emissions based on the most recent science.<sup>282</sup> The parameters and data within agronomic GHG models should be reconciled so that producers can use one tool in determining overall sequestration or emissions. USDA has indicated that work is under way in this regard. One place that NRCS may be able to look to in the future, once it is built, is the "best practices database" for biomass cropping created by the 2008 Farm Bill's Agricultural Bioenergy Feedstock and Energy Efficiency Research and Extension Initiative.<sup>283</sup> The program provides grants for research that can close many of the knowledge gaps in biomass production, including crop species selection, nutrient management, management practices, environmental impacts, and economics.<sup>284</sup> In all respects, NRCS should avail itself of its process for developing interim practice standards so that sustainable practices can be adopted as timely as possible.<sup>285</sup>

"Assessing the impact of [sustainable] farming practices on biodiversity and ecosystem services is fundamental" to "the reconciliation of demands for biodiversity conservation and increased agricultural production" inherent in sustainable development policy.<sup>286</sup> Although accountability mechanisms for conservation programs have been in place since at

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281. See generally Craig Cox, *Congress Poised to Cut Conservation Funds that Aided Farm Bill's Passage*, ENVTL. WORKING GRP. (Sept. 2008), <http://www.ewg.org/reports/conservationcuts>.

282. Esther Turnhout et al., *Ecological Indicators: Between the Two Fires of Science and Policy*, 7 ECOLOGICAL INDICATORS 215, 225–26 (2007).

283. Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 7207, § 1672C(e), 122 Stat. 1651, 2001 (codified at 7 U.S.C. § 5925e(e) (Supp. III 2010)).

284. *Id.* sec. 7207, § 1672C(c)(1)(A), at 2000 (codified at 7 U.S.C. § 5925e(c)(1)(A)).

285. See *infra* Part III.A.2 (detailing the interim standard process).

286. S.J. Butler et al., *Farmland Biodiversity and the Footprint of Agriculture*, 315 SCIENCE 381, 381 (2007).

least 1977,<sup>287</sup> some question whether the NRCS conservation framework alone truly can achieve significant sustainability gains despite the amount of data that USDA gathers on environmental performance.<sup>288</sup> When additional conservation programs such as the CSP and EQIP were added in the 2002 Farm Bill, NRCS initiated the CEAP, bringing together multiple federal agencies to scientifically quantify the beneficial effects of USDA's conservation programs and the potential to improve on conservation practices.<sup>289</sup>

The three core elements of the CEAP include regional and national assessments of how conservation practices can meet environmental goals within different systems (i.e., cropland, wildlife, wetlands, and grazing lands),<sup>290</sup> watershed-focused assessments,<sup>291</sup> and identification of current knowledge through literature reviews and workshops to identify the state of current science and gaps in scientific understanding.<sup>292</sup> In 2005, USDA created a blue ribbon panel lead by the Soil and Water Conservation Society to assess USDA's plan and make recommendations on how to ensure the CEAP's credibility and utility.<sup>293</sup> Four framework questions emerged from the discussions that should apply to an evaluation of any sustainability scheme:

1. What should be measured, and how, to account for environmental effects at landscape and watershed scales?
2. Methods for environmental management research at landscape and watershed scales;
3. The science of targeting within landscapes and watersheds to improve conservation effectiveness;
4. Realistic expectations about the timing between conservation implementation and environmental effects.<sup>294</sup>

The panel issued several recommendations. First, it logically suggested that before measuring effects of conservation practices, USDA must determine what should be accomplished in the first place.<sup>295</sup> As part of this determination, NRCS could rely, in part, on resource assessments done as part of conservation planning to determine which areas require

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287. See SOIL & WATER CONSERVATION SOC'Y, *supra* note 201, at 13.

288. See, e.g., *Agricultural Resources and Environmental Indicators*, ECON. RESEARCH SERV. (July 2006), <http://www.ers.usda.gov/publications/arei/eib16/>.

289. SOIL & WATER CONSERVATION SOC'Y, *supra* note 201, at 9.

290. *Id.*

291. Thirty-eight assessments were carried out in the first five years of CEAP. Lisa F. Duriancik et al., *The First Five Years of the Conservation Effects Assessment Project*, 63 J. SOIL & WATER CONSERVATION 185A (2008); *Conservation Effects Assessment Project*, NAT'L AGRIC. LIBRARY, [http://wqic.nal.usda.gov/nal\\_display/index.php?info\\_center=7&tax\\_level=3&tax\\_subject=595&topic\\_id=2422&level3\\_id=6990&level4\\_id=0](http://wqic.nal.usda.gov/nal_display/index.php?info_center=7&tax_level=3&tax_subject=595&topic_id=2422&level3_id=6990&level4_id=0) (last modified Dec. 7, 2010).

292. Duriancik et. al., *supra* note 291, at 185A.

293. *Id.* at 185A-186A.

294. *Id.* at 186A.

295. SOIL & WATER CONSERVATION SOC'Y, *supra* note 201, at 10.

priority attention.<sup>296</sup> Further, the panel urged USDA to consider the context in which the effect occurs. That is, an effect in a highly sensitive watershed or wildlife habitat is greater than one accomplished in isolation or in less sensitive areas.<sup>297</sup> The panel emphasized actual monitoring over modeling that can be plagued by “uncertainties and error” due to missing data, inability to accurately correlate a practice with an effect, and the difficulty in simulating complex ecosystem function.<sup>298</sup> The Panel urged Congress to reauthorize the Soil and Water Resource Conservation Act of 1977 (RCA) to provide further support and an umbrella framework for all assessments of federal conservation activities,<sup>299</sup> which Congress did in the 2008 Farm Bill.<sup>300</sup> Pursuant to the RCA and 2008 Farm Bill amendments, NRCS must report its assessment of conservation practices and their effects to Congress in 2011,<sup>301</sup> shortly after EPA will report on RFS2’s environmental effects.<sup>302</sup> Lastly, the panel recommended that the Office of Management and Budget, which plays a key role in reviewing final regulations, focus on evaluating overall, cumulative outcomes of

296. See *supra* Part III.A.1 (Identifying Resource Concern(s)). *But see* SOIL & WATER CONSERVATION SOC’Y, *supra* note 201, at 6 (urging NRCS to use the NRI more effectively by gathering more useful statistical information that in turn can be scientifically analyzed).

297. SOIL & WATER CONSERVATION SOC’Y, *supra* note 201, at 10.

298. *Id.* at 11.

299. *Id.* at 13.

300. Soil and Water Resources Conservation Act of 1977, 16 U.S.C. §§ 2001–2009 (2006 & Supp. III 2010), *amended by* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, sec. 2804, 122 Stat. 1651, 1814–16 (codified at 16 U.S.C. §§ 2001, 2004–2006, 2009). The RCA requires the Secretary of Agriculture to periodically assess the state of soil and water resources, design, implement, and update a plan to conserve those resources, with the report results sent to Congress. Specifically, the Act charges NRCS with gathering categories of data, including:

- (1) . . . the quality and quantity of soil, water, and related resources, including fish and wildlife habitats;
- (2) . . . the capability and limitations of those resources for meeting current and projected demands on the resource base;
- (3) . . . the changes that have occurred in the status and condition of those resources resulting from various past uses, including the impact of farming technologies, techniques, and practices;
- (4) . . . current Federal and State laws, policies, programs, rights, regulations, ownerships, and their trends and other considerations relating to the use, development, and conservation of soil, water, and related resources;
- (5) . . . the costs and benefits of alternative soil and water conservation practices;
- (6) . . . alternative irrigation techniques regarding their costs, benefits, and impact on soil and water conservation, crop production, and environmental factors; and
- (7) . . . conservation plans, conservation practices planned or implemented, environmental outcomes, economic costs, and related matters under conservation programs administered by the Secretary.

16 U.S.C. § 2004(a), *as amended by* Food, Conservation, and Energy Act sec. 2804(b)(1), 122 Stat. at 1814–15 (codified at 16 U.S.C. § 2004(a)(5)–(7)).

301. For general information on NRCS efforts in this regard, see *Soil and Water Resources Conservation Act*, NATURAL RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/technical/rca/> (last updated Jan. 29, 2010).

302. See *infra* text accompanying notes 46–47.

conservation programs using its Program Assessment and Rating Tool.<sup>303</sup> Although not addressed in the panel's report, policymakers should consider what role assessments done pursuant to NEPA can play in evaluating the likely effects of conservation practices.<sup>304</sup> Executive Orders also require some level of effectiveness analysis.<sup>305</sup> In light of all of these assessment efforts, Congress and the executive branch must consider unifying all of these different assessments into one omnibus scheme for setting environmental goals and measuring practices' effects so as to avoid what appears to be inefficient redundancy.

At the same time that these important assessments are occurring,<sup>306</sup> which hopefully will shed new light on the right direction for federal agricultural sustainability policy overall and specifically within NRCS, the CSBP concurrently will be providing the type of ground-level assessment and monitoring recommended by the CEAP blue ribbon panel.<sup>307</sup> The CSBP is field-testing its standard during the 2010 and 2011 growing seasons at a scale large enough to adequately gauge the effect of sustainability practices. National NRCS representatives participate in the CSBP process, and producers will be working with their local NRCS offices to identify and solidify synergies between the NRCS framework and the CSBP provisional standard. The Council will incorporate results of each field-test into the standard, making modifications as necessary and as knowledge evolves. The CSBP will also concurrently study the "value proposition" of a sustainability standard for producers. In order for any biomass sustainability standard to be widely adapted, the producer must see a value proposition of certification.<sup>308</sup> The CSBP Value Proposition Task Force will consider whether a "coarser" version of the standard could be developed for compliance with public policies—whatever those policies may turn out to be—with implementation of the

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303. SOIL & WATER CONSERVATION SOC'Y, *supra* note 201, at 15.

304. 42 U.S.C. §§ 4321–4370f (2006). For example, the Programmatic Environmental Impact Statement prepared for the BCAP program concluded that site-specific evaluations might be necessary to gauge the impact of biomass crop subsidies on the environment. Notice of Availability of the Draft Programmatic Environmental Impact Statement for the Biomass Crop Assistance Program, 74 Fed. Reg. 39,915 (Aug. 10, 2009); FARM SERV. AGENCY, U.S. DEP'T OF AGRIC., PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (2009), [http://www.fsa.usda.gov/Internet/FSA\\_File/bcapseisbody.pdf](http://www.fsa.usda.gov/Internet/FSA_File/bcapseisbody.pdf). For a detailed explanation of the PEIS, see Endres et al., *supra* note 50, at 10,073–75.

305. See, e.g., *Soil and Water Resources Conservation Act*, *supra* note 301 (detailing the benefits stemming from the CSP interim rule, as required by Executive Order No. 12,866).

306. For example, a cornerstone CEAP assessment of one of the most impacted ecosystems from agricultural practices issued in June 2010. See NATURAL RES. CONSERVATION SERV., U.S. DEP'T OF AGRIC., ASSESSMENT OF THE EFFECTS OF CONSERVATION PRACTICES ON CULTIVATED CROPLAND IN THE UPPER MISSISSIPPI RIVER BASIN (2010), [ftp://ftpfc.sc.egov.usda.gov/NHQ/nri/ceap/UMRB\\_final\\_draft\\_061410.pdf](ftp://ftpfc.sc.egov.usda.gov/NHQ/nri/ceap/UMRB_final_draft_061410.pdf).

307. SOIL & WATER CONSERVATION SOC'Y, *supra* note 201, at 11. See generally PETER SENGE, JON JOHNSON & HAL HAMILTON, OPERATIONALIZING SUSTAINABILITY IN VALUE CHAINS (2009), <http://sustainablefood.org/images/stories/pdf/operationalize%20sustainability.pdf> (noting that important decisions cannot be made, including by setting standards, without sufficient and accurate information).

308. Jinke van Dam et al., *Overview of Recent Developments in Sustainable Biomass Certification*, 32 BIOMASS & BIOENERGY 749, 769–70 (2008) (discussing the cost levels of certification).

full standard if and when a consumer or ecosystems services market would reward sustainable practices beyond regulatory requirements. The CSBP received a \$750,000 grant from NRCS in mid-2010, which is a sign that NRCS may be looking to the CSBP to develop its own standards (that may, in turn, apply to BCAP payments).<sup>309</sup>

Policymakers also should consider how the measurement tools and other sustainability ranking mechanisms in various federal conservation subsidy programs can be integrated into federal sustainability policy for biomass. One example would be in implementation of BCAP, and how priorities are set for both matching payment and project area funding. Arguably, priority for limited funding should be given to those projects that can prove, like with the CSP, CRP, WHIP or EQIP programs, that a certain level of environmental benefit will be achieved. At a broader level, Congress should create, from the various conservation programs, one sustainability scoring mechanism with consistent goals and accompanying qualifying practices, and that incorporates concepts such as additionality. This would eliminate redundancy for producers and streamline efforts at NRCS in developing evaluation tools and practice standards. Lastly, as demand for agricultural acreage inevitably grows, incorporating sustainability considerations across-the-board (i.e., including them into all subsidy or incentives programs) could be an “equalizer” in heated “food versus fuel” debates. Although not the focus of this Article, “sustainability” of human eating habits cannot be decoupled from agronomic sustainability considerations and instead must be the next frontier of discussion in relation to subsidization of production for animal feed and not food for direct consumption. How marginal lands are used must also enter the sustainability discussion at the federal level.<sup>310</sup> Only then can energy biomass cropping on productive lands—and marginal lands—be accommodated and the environmental benefits stemming from perennial cropping be fully recognized.

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309. See *USDA Announces Recipients of Conservation Innovation Grants in 43 States*, NATURAL RES. CONSERVATION SERV. (Aug. 12, 2010), [http://www.nrcs.usda.gov/news/releases/2010/cig\\_8.12.10.html](http://www.nrcs.usda.gov/news/releases/2010/cig_8.12.10.html).

310. Marginal and abandoned cropland and pasture, which numbers over 72 million acres in the United States, may present the greatest opportunity for energy biomass cropping because it avoids areas traditionally used for food production. DALE ET AL., *supra* note 31, at 4. Sustainable land use practices, however, would still have to be deployed to avoid natural resource degradation and to sequester carbon, and sensitive ecological areas of significance must be off-limits altogether. See *id.*; David Tilman et al., *Carbon-Negative Biofuels from Low-Input High-Diversity Grassland Biomass*, 314 SCIENCE 1598 (2006). And, at the most, scientists estimate the total production potential of these lands at merely five percent of the net world energy supply. Tilman et al., *supra*, at 1600.

