NATIONAL STRATEGY TO PROMOTE THE HEALTH OF HONEY BEES AND OTHER POLLINATORS

Pollinator Health Task Force

MAY 19, 2015

THE WHITE HOUSE
WASHINGTON

May 19, 2015

On behalf of the Pollinator Health Task Force, we are pleased to transmit the *National Strategy to Promote the Health of Honey Bees and Other Pollinators* (Strategy). Developed through a collaborative effort across the Executive Branch, this Strategy outlines a comprehensive approach to tackling and reducing the impact of multiple stressors on pollinator health, including pests and pathogens, reduced habitat, lack of nutritional resources, and exposure to pesticides. Building on the current state of the science, and with a renewed emphasis on expanding our understanding of the complex interactions among the various factors impacting pollinator health, the Strategy lays out current and planned Federal actions to achieve the following overarching goals:

- **Honey Bees:** Reduce honey bee colony losses during winter (overwintering mortality) to no more than 15% within 10 years. This goal is informed by the previously released Bee Informed Partnership surveys and the newly established quarterly and annual surveys by the USDA National Agricultural Statistics Service. Based on the robust data anticipated from the national, statistically-based NASS surveys of beekeepers, the Task Force will develop baseline data and additional goal metrics for winter, summer, and total annual colony loss.
- **Monarch Butterflies:** Increase the Eastern population of the monarch butterfly to 225 million butterflies occupying an area of approximately 15 acres (6 hectares) in the overwintering grounds in Mexico, through domestic/international actions and public-private partnerships, by 2020.
- **Pollinator Habitat Acreage:** Restore or enhance 7 million acres of land for pollinators over the next 5 years through Federal actions and public/private partnerships.

The Strategy addresses the four themes central to the June 2014 Presidential Memorandum "Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators," namely: conducting research to understand, prevent, and recover from pollinator losses; expanding public education programs and outreach; increasing and improving pollinator habitat; and developing public-private partnerships across all these activities. A critical component of the Strategy is to advance the science underpinning the government's land management and regulatory decisions. To this end, the Task Force has prepared the accompanying "Pollinator Research Action Plan," which outlines gaps in current knowledge of pollinators and pollinator declines, and identifies priority research efforts needed to close these gaps.

The Strategy also advances ambitious Federal commitments to increase and improve habitat for pollinators, both directly through the large variety of facilities and acreages of land managed by the Federal government, and indirectly through the leadership role that Federal agencies can play in interactions with states, localities, the private sector, and citizens. These actions range from planting pollinator gardens and improving land management practices at Federal facilities, to advancing the availability and use of pollinator-friendly seed mixes in land management, restoration, and rehabilitation actions nationwide.

By expanding the conversation through enhanced public education and outreach, as well as strongly-built public/private partnerships, the Strategy seeks to engage all segments of our society so that, working together, we can take meaningful and important steps to reverse pollinator declines.

Pollinators are critical to our Nation's economy, food security, and environmental health. Honey bee pollination alone adds more than $15 billion in value to agricultural crops each year, and provides the backbone to ensuring our diets are plentiful with fruits, nuts, and vegetables. Through the actions discussed in this Strategy, and by working with partners across our country, we can and will help restore and sustain pollinator health nationwide.

Hon. Tom Vilsack

Secretary of Agriculture

Hon. Gina McCarthy

Administrator, U.S. Environmental Protection Agency

Contents

Executive Summary

Wherever flowering plants flourish, pollinating bees, birds, butterflies, bats, and other animals are hard at work, providing vital but often unnoticed services. But many pollinators are in serious decline in the United States and worldwide. Preventing continued losses of our country's pollinators requires immediate national attention, as pollinators play a critical role in maintaining diverse ecosystems and in supporting agricultural production. Some three-fourths of all native plants in the world require pollination by an animal, most often an insect, and most often a native bee. Pollinators, most often honey bees, are also responsible for one in every three bites of food we take, and increase our nation's crop values each year by more than 15 billion dollars. Unabated, these losses of our pollinators threaten agricultural production, the maintenance of natural plant communities, and the important services provided by those ecosystems, such as carbon cycling, flood and erosion control, and recreation.

In response to this threat, in June 2014, President Obama issued a memorandum establishing a Pollinator Health Task Force, co-chaired by the Secretary of Agriculture and the Administrator of the Environmental Protection Agency. The Task Force created this document, the *National Strategy to Promote the Health of Honey Bees and Other Pollinators* (Strategy), to promote the health of honey bees (*Apis mellifera*) and other managed bees, wild bees (both native and introduced species), butterflies and other pollinating insects, and birds and bats.

The Strategy expands and adds to actions already being undertaken by Federal departments and agencies to reverse pollinator losses and restore populations to healthy levels. It focuses on both immediate and long-term changes that can be made to improve the well-being of pollinator populations. Consequently, the Strategy addresses the many factors impacting pollinator health, including certain land-use practices, declining forage and nesting resources, pests and diseases, pesticides, and bee biology.

While our nation is a mosaic of land uses and ownerships, pollinating animals do not recognize human-drawn boundaries. They make use of food and habitat anywhere it is found, whether on national park land, a roadside strip, the edge of an agricultural field, or a schoolyard garden. Therefore, no single organization, Federal or private, can independently shoulder the burden of helping pollinators, and the Task Force has been charged with an "all hands on deck" approach to promoting the health of honey bees and other pollinators.

The Strategy knits together commitments and plans from many Federal departments and agencies, bringing a variety of missions and programs to bear toward a single, unified goal—promoting the health of the nation's pollinators. The Federal government is the largest land manager in the Nation and through its programs can also coordinate with private sector actions. In response to the Presidential Memorandum, land management agencies are identifying lands to manage for new and better pollinator habitats: the U.S. Environmental Protection Agency (EPA) is working to balance the unintended consequences of chemical exposure with the need for pest control; the U.S. Department of Agriculture (USDA) is looking to expand pollinator habitats, particularly summer foraging areas, under the Conservation Reserve Program; and habitat opportunities are being found in new and creative places, such as on rights-of-way and other easements.

One innovative approach with great potential is the inclusion of pollinator-friendly landscaping at Federal facilities. Beneficial landscaping and gardens are already in place at a number of Federal facilities, such as the Smithsonian Institution, the National Zoo, USDA, and the White House Pollinator Garden, with others being planned by the Departments of Transportation, Interior, Defense, and State, the EPA, and others.

This Strategy outlines three overarching goals for action by Federal departments and agencies in collaboration with public and private partners:

1. Reduce honey bee colony losses during winter (overwintering mortality) to no more than 15% within 10 years. This goal is informed by the previously released Bee Informed Partnership surveys and the newly established quarterly and annual surveys by the USDA National Agricultural Statistics Service. Based on the robust data anticipated from the national, statistically-based NASS surveys of beekeepers, the Task Force will develop baseline data and additional goal metrics for winter, summer, and total annual colony loss.
2. Increase the Eastern population of the monarch butterfly to 225 million butterflies occupying an area of approximately 15 acres (6 hectares) in the overwintering grounds in Mexico, through domestic/international actions and public-private partnerships, by 2020.
3. Restore or enhance 7 million acres of land for pollinators over the next 5 years through Federal actions and public-private partnerships.

To achieve these goals, the Task Force developed a series of action plans and resources. Underpinning these goals is the Pollinator Research Action Plan (PRAP 2015), designed to focus Federal efforts on producing the scientific information needed to understand, minimize, and recover from pollinator losses. Task Force agencies also developed pollinator Best Management Practice (BMP) guidance for Federal buildings and designed and natural landscapes. Federal agencies are identifying pollinator-beneficial plants that meet nutritional needs of honey bees and other pollinators. The National Seed Strategy for Rehabilitation and Restoration will develop a seed bank of appropriate plants to support restoration activities and to help ensure a stable, economical supply of diverse native plants.

Increasing the national awareness of the importance of pollinator conservation is addressed in agency plans for public outreach and education. These plans constitute a multifaceted portfolio of public education and outreach strategies for multiple audiences: individuals; small businesses and corporations; schools, libraries, museums, and other educational venues; demographically diverse audiences; and Federal land-management staff.

Understanding that the Federal government cannot act alone in promoting pollinator protection, the President also identified the need for public-private partnerships. The Strategy includes recommendations and guidance for developing public-private partnerships to build on Federal efforts encouraging the protection of pollinators and increasing the quality and quantity of pollinator habitat. The Task Force welcomes partnership ideas, and will prepare a Partnership Action Plan within six months of release of this Strategy.

As pollinator science matures and our information about pollinators becomes more robust, so too will the long-term Federal strategy. Specific goals and milestones are identified in the Strategy, along with associated timelines and metrics for evaluating the Strategy's success. Progress toward these goals and actions will be assessed and publicly disseminated annually.

Introduction

Pollinators are crucial members of various ecosystems, from farmland to wilderness to urban environments. There are an estimated several hundred thousand flowering plant species, many of which depend on pollinators to reproduce (National Research Council 2007). A variety of animals serve as pollinators, *e.g.*, bees, wasps, flies, butterflies, moths, bats, beetles, and birds. The attributed value of crops that are directly dependent on insect pollination was estimated at $15 billion in 2009 in the United States (Calderone 2012).

Domestic Losses of Honey Bees

Honey bees, the most recognizable pollinators of hundreds of economically and ecologically important crops and plants in North America, are an introduced insect, brought to the United States in the 1620's by early settlers. Approximately 2,000-3,000 commercial[1] U.S. beekeepers manage their bee colonies as livestock, traveling across the country with their bees to service pollination contracts with U.S. farmers and to support honey production (Calderone 2012).

Honey bees have been in serious decline for more than three decades in the United States, as noted in the National Academy of Sciences report *Status of Pollinators in North America* (National Research Council, 2007). Declines in the number of managed honey bee colonies used in honey production have been documented by the USDA's National Agricultural Statistics Service (USDA 2014). Starting in the 1940's when there were approximately 5.7 million colonies in the United States, the number of managed colonies used in honey production has declined to approximately 2.74 million colonies today (**Figure 1**). Sharp colony declines were seen following the introduction in 1987 of an external parasitic mite (*Varroa destructor*) that feeds on honey bee hemolymph (blood), and again around 2006 with the first reports of a condition referred to as Colony Collapse Disorder (CCD). Colonies diagnosed with CCD exhibit a rapid loss of adult worker bees, have few or no dead bees present in the colony, have excess brood and a small cluster of bees remaining with the queen bee, and have low Varroa mite and Nosema (fungal disease) levels. Colonies exhibiting CCD have insufficient numbers of bees to maintain the colony (*e.g.*, rearing and maintenance of developing young, food collection, and hygiene) and these colonies eventually die. Although CCD has become synonymous with all honey bee colony declines, the actual proportion of losses directly attributable to CCD is low and has been decreasing over the past four years, based on beekeeper winter loss surveys conducted by the Bee Informed Partnership, supported by the USDA (Steinhauer *et al*. 2014).

Although **Figure 1** indicates that the number of managed honey bee colonies has been relatively consistent since 1996, the level of effort by the beekeeping industry to maintain these numbers has increased. Annual surveys of beekeepers since 2006 indicate overwintering losses alone averaging around 31% (**Figure 2**), which far exceeds the 15-17% overwintering loss rate that commercial beekeepers have indicated is an economically sustainable average (Steinhauer *et al.* 2014). When overwintering losses are coupled with colony losses occurring during other times of the year, annual losses can be considerably higher (Steinhauer *et al.* 2014). This is particularly notable in the 2014-15 preliminary report of 27.4%

1. The American Beekeeping Federation classifies beekeepers based on the number of honey bee colonies they maintain: small scale (<25 colonies), sideliner (25 – 300 colonies), and commercial (>300 colonies).

total summer colony losses in the Bee Informed Partnership survey of a subset of national beekeepers, for total annual losses of 42.1% of colonies (Steinhauer et al. 2015).

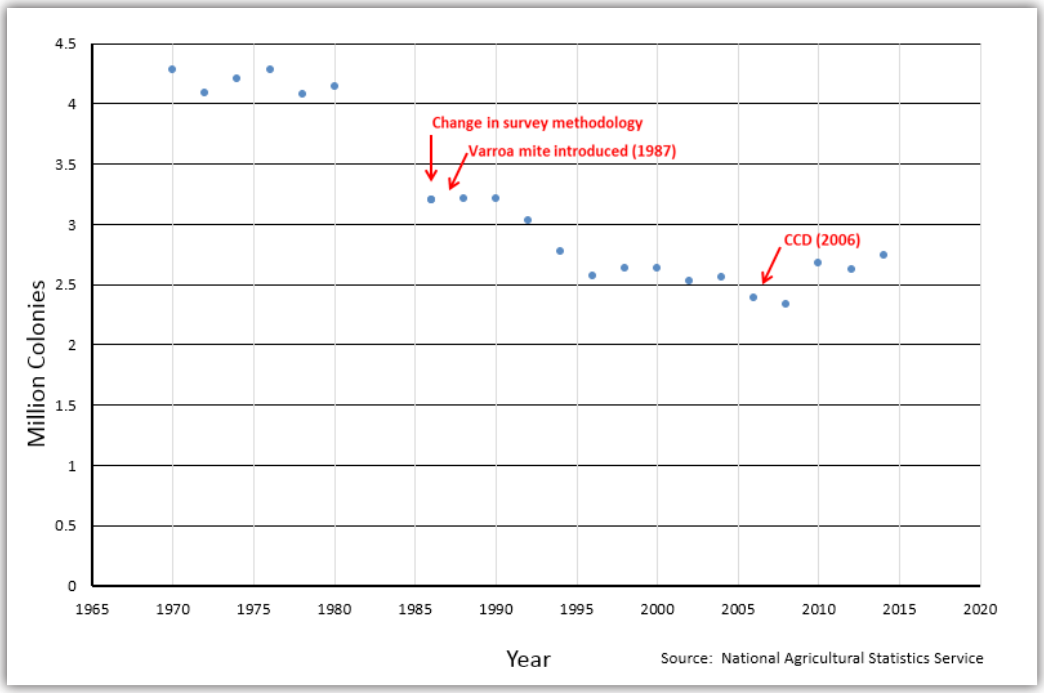

Figure 1. Numbers (in millions) of managed honey bee colonies in the United States used for honey production by year based on NASS survey data. The gap between 1982–1986 reflects the period when the survey was not conducted. The figure illustrates when the Varroa mite was introduced into the United States in 1987, and when Colony Collapse Disorder was first documented in 2006.

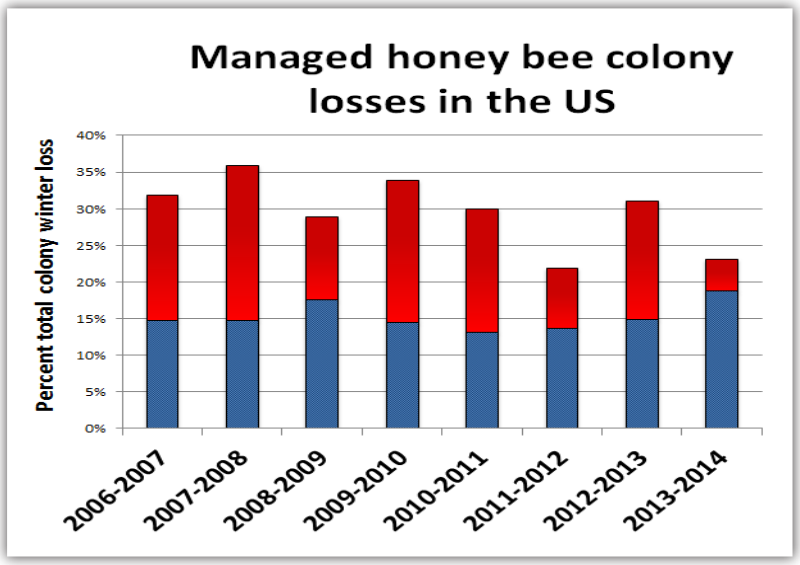

Figure 2. Annual overwintering losses of managed honey bee colonies (October 1–April 1; red bars), and self-declared acceptable mortality level from participant beekeepers (blue bars). Bee Informed Partnership 2014 (http://beeinformed.org/2014/05/colony-loss-2013-2014/).

Meeting the growing demand for pollination services in agricultural production has become increasingly difficult. Beekeepers transport bees long distances to pollinate crops such as apples, blueberries, cherries, squash, and, particularly, almonds. Approximately 60–75% of all U.S. commercial honey bee colonies are required in almond orchards early each spring to fulfill pollination contracts (Bond *et al*. 2014). When overwintering colony losses are high, beekeepers must compensate for these losses by "splitting" one colony into two, supplying the second colony with a new queen bee and supplemental food in order to quickly build up colony strength to fulfill almond pollination contracts. This practice results in increased maintenance costs to both the beekeeper and the orchard grower renting the hives, with hive rental fees for almond pollination rising from approximately $76 per hive in 2005 to over $150 per hive in 2009 (Bond *et al.* 2014).

Researchers studying CCD and other losses attributed to poor colony health have been unable to identify a single cause, and have concluded that losses of honey bee colonies are the result of a complex set of interacting stressors. In May 2013, the USDA and the EPA released a comprehensive scientific report on honey bee health (USDA 2013). The report synthesized the current state of knowledge regarding the primary factors that scientists believe have the greatest impact on honey bee health, including exposure to pesticides and other environmental toxins, poor nutrition due in part to decreased availability of high-quality/diverse forage, exposure to pests (*e.g.*, Varroa mites) and disease (viral, bacterial, and fungal), as well as bee biology, genetics, and breeding. The report's findings are similar to those of the report on the *Status of Pollinators in North America* (NRC 2007), which examined wild (both native and introduced species) pollinators as well as honey bees.

Domestic Losses of Other Pollinators

In addition to honey bees, there are over 4,000 wild bee species in the United States (Moisset and Buchmann 2011). Population declines in the United States have been documented for some populations of non-managed pollinators, *e.g.*, the two-formed bumble bee (*Bombus bifarius*) (Spivak *et al.* 2011; Cameron *et al.* 2011), but little is known about trends for populations of non-managed bees that comprise the majority of pollinators (Winfree *et al.* 2007; Lebuhn *et al.* 2013). Some bumble bee populations are suffering from introduced pests and diseases, potentially transferred from managed bees (Colla *et al.* 2006; McMahon *et al.* 2015). Non-*Apis* bees, butterflies, bats, and other managed or wild pollinators are also impacted by habitat loss and degradation, and there is strong evidence that, for some species, habitat loss has led to population declines (NRC 2007; Potts *et al.* 2010). All pollinators must also cope with the effects of climate change, which may have direct impacts on behavior and physiology, and indirect impacts through floral resource availability and phenology, as well as changing dynamics of pests, pathogens, predators, and competitors (Potts *et al.* 2010; Le Conte and Navajas 2008).

As with honey bees and other managed or wild bee pollinators, there have been marked (~90%) declines in monarch butterfly (*Danaus plexippus*) populations over the past several years (**Figure 3**). In February 2014, President Obama committed to work together with Canadian Prime Minister Stephen Harper and Mexican President Enrique Peña Nieto to ensure the conservation of the monarch butterfly. Much of a monarch butterfly's life is spent completing part of an annual cycle of migration over the course of multiple generations, either across North America between Canada into Mexico (Eastern migration), or between the Rocky Mountains and groves in California (Western migration). The iconic Eastern migra-

tion, in particular, has become less successful for many monarchs because of losses in nectar-producing plants that provide sustenance to the adult butterflies, as well as in the availability of milkweed plants on which developing monarch larvae feed exclusively. Primary stressors of concern for the Eastern population include loss of milkweed breeding habitat in corn and soybean production, loss of breeding habitat due to land conversion, illegal logging and deforestation at overwintering sites, and extreme weather conditions. Natural enemies such as diseases, predators, and parasites, and use of insecticides in agricultural, urban, and suburban areas are also of concern.

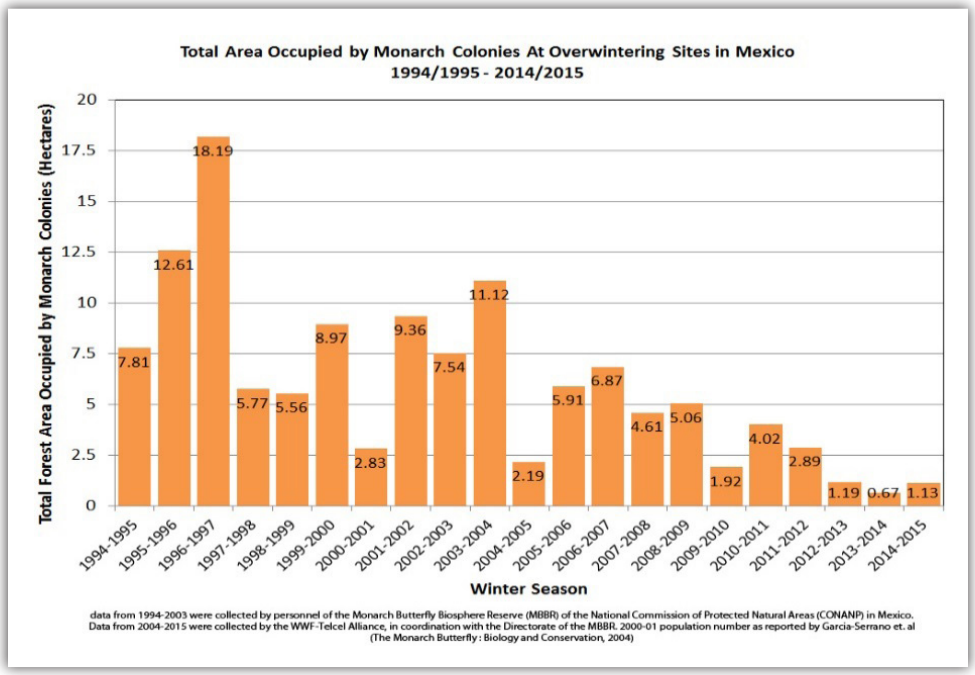

Figure 3: Area of forest occupied by colonies of hibernating monarch butterflies in Mexico from 1994 –2015 (Graph courtesy of the Monarch Joint Venture).

Determining the current status of insect pollinator communities, documenting shifts in distribution and abundance of various species, and refining methodologies for documenting changes remain important areas of research (Lebuhn *et al.* 2013), along with developing taxonomic capacity to identify the thousands of North American bee species. Additional research is also needed on the value of pollinators in natural systems, which is much more difficult to discern than for managed honey bees. The economic value of managed non-*Apis* bees, *e.g.*, blue orchard bees (*Osmia lignaria*), alfalfa leafcutting bees (*Megachile rotundata*), bumble bees (*Bombus spp.*), etc., has not been well-quantified, despite the fact that these species are highly effective crop pollinators. Wild, native bees also provide the majority of pollination that helps maintain natural plant communities which contribute to a variety of valuable ecosystem services, including carbon sequestration, water filtration, and erosion control (NRC 2007). Simultaneous declines in wild and managed pollinator populations globally, with noted decreases in honey bees, bumble bees, and monarch butterflies, have brought into focus the importance of pollinator conservation (Cameron *et al.* 2011; NRC 2007; Pettis and Delaplane 2010; vanEngelsdorp *et al.* 2009).

International Considerations

Declines in honey bees, wild bees, and other pollinators are not unique to the United States. Across the globe, similar patterns of decline in wild and managed pollinator populations have been documented over similar timespans (Biesmeijer *et al.* 2006). From 1985–2005, the number of managed honey bee colonies declined in many countries in Europe, along with marked declines in beekeepers (Potts *et al.* 2010). A number of international organizations have undertaken efforts to better understand the causes and magnitude of pollinator population declines. Such global activities, including the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), as well as efforts through the International Bee Research Association (IBRA), inform and are informed by work being undertaken in the United States. Federal agencies, such as the USDA and the EPA, are working with their counterparts in the Organisation for Economic Cooperation and Development (OECD) and with researchers internationally through the International Commission on Plant-Pollinator Relationships (ICPPR) and the Colony Loss (COLOSS) Network to understand the factors associated with global declines in pollinator species and how these declines can be mitigated. International cooperation, financially and scientifically, leverages U.S. investments with investments being made by other countries, and also provides an opportunity for the United States, with its diversity of ecosystems and large Federal and Federally-funded research community, to contribute to solving this global challenge.

In many countries, estimates for pollinator populations and the magnitude of different possible stressors are not available for comparison to what is being experienced in this country. The forthcoming IPBES assessment on pollination, pollinators, and food production, due to be completed in 2015, may reveal other sources of information or significant international gaps in understanding the magnitude of losses and the potential consequences if left unchecked. This assessment will also address monetary and non-monetary ecosystem services provided by pollinators across the globe.

Establishment of the Pollinator Health Task Force

Given the breadth, severity, and persistence of pollinator losses, President Obama issued his June 20, 2014 Presidential Memorandum, "Creating a Federal Strategy To Promote the Health of Honey Bees and Other Pollinators" (FR Doc. 2014-14946; White House 2014), to the heads of Federal departments and agencies, calling for the creation of a Federal strategy to promote the health of honey bees and other pollinators. Citing the critical roles that pollinators play in contributing to the economy, providing a nutritious supply of fruits, nuts, and vegetables, and maintaining a variety of valuable ecosystem services, the President charged Federal departments and agencies with taking steps to reverse pollinator losses and to help restore pollinator populations. The Federal government is poised to lead this effort, given its broad national perspective and ability to identify and prioritize goals and programs that extend beyond state and national borders. Understanding that the Federal government cannot act alone in promoting pollinator protection, the President also identified the need for public-private partnerships as well as increased citizen engagement.

To accomplish this effort, the President created the Pollinator Health Task Force, co-chaired by the Secretary of Agriculture and the Administrator of the Environmental Protection Agency. In addition to USDA and EPA, the Task Force was chartered to include representation from the following departments and agencies:

- Council on Environmental Quality (CEQ);
- Department of Defense (DOD);
- Department of Education (ED);
- Department of Energy (DOE);
- Department of Housing and Urban Development (HUD);
- Department of the Interior (DOI);
- Department of State (DOS);
- Department of Transportation (USDOT);
- Domestic Policy Council (DPC);
- General Services Administration (GSA);
- National Science Foundation (NSF);
- National Security Council (NSC);
- Office of Management and Budget (OMB);
- Office of Science and Technology Policy (OSTP); and,
- Such executive departments, agencies, and offices as the Co-Chairs may designate.

Since its initial formation, the Task Force has expanded to include representatives from the Smithsonian Institution (SI) and the Federal Emergency Management Agency (FEMA).

To advance the state of knowledge used to inform pollinator protection efforts through interagency collaboration, the Task Force developed a Pollinator Research Action Plan (PRAP 2015) and Pollinator-Friendly Best Management Practices for Federal Lands (USDA/DOI 2015), to assist agencies in developing and enhancing pollinator habitat. The Task Force also oversaw the development of agency public education and outreach plans. The *National Strategy to Promote the Health of Honey Bees and Other Pollinators* (Strategy) is comprised of these materials, with an emphasis on public-private partnerships. The Strategy addresses the key stressors that impact pollinator health, notably: (1) nutrition, with a focus on providing adequate forage resources for pollinators; (2) land-use policies and practices to increase forage and nesting resources for a variety of pollinators; (3) management of arthropod pests and disease pathogens; (4) pesticides; and (5) rearing issues, including bee biology, genetics, and breeding. To be successful in reversing pollinator declines, it is vital that the Strategy address all of the above factors and the complex interactions between each of these factors that are likely contributing to declines.

The Presidential Memorandum empowers the Task Force to move forward with a broad range of activities and partnerships that collectively are intended to reverse pollinator declines. The Strategy focuses on both immediate changes that can be made to improve pollinator health, consistent with the best-available science to support these actions, as well as efforts to improve pollinator health over the long term. In implementing the Strategy, Federal agencies will lead by example and will also more fully engage public and private partners in academia, non-governmental organizations, private industry, state and local governments, foundations, and private citizens.

Development of the National Pollinator Health Strategy

The Presidential Memorandum instructed the Task Force to develop a National Pollinator Health Strategy that incorporates research and development, outreach, and public-private partnerships. In addition, building on agency-specific actions, either identified in the Presidential Memorandum or through enhanced actions by individual agencies, the Strategy seeks to identify opportunities and initiatives for addressing both short-term and long-term habitat improvement that will benefit overall pollinator health. Through revised guidance, Federal contracting procedures, and regulatory actions, a priority outcome of this Strategy is to institutionalize changes into Federal initiatives to ensure that pollinator health actions have longevity and lead to continuing improvement. While the focus of the Strategy is on improving pollinator health, many of the recommendations identified in the Strategy will also have collateral benefits in improving ecosystems more broadly, through encouraging development and maintenance of native habitats and more ecologically sustainable land management practices. This is especially true for efforts to protect the monarch butterfly, which is a minor pollinator but a major indicator of biodiversity and ecosystem health.

Target Outcomes

A key to the Strategy is the inclusion of metrics for measuring successes and to identify the need to adjust actions in advancing the Strategy's goal, which is to restore the health of affected pollinator species and prevent further unacceptable declines. Success will be assessed through three outcome metrics: (1) returning honey bee colony health to acceptable levels (approximately 15% overwintering loss, a level from which beekeepers are capable of successfully dividing surviving healthy colonies to remain economically viable); (2) increasing monarch butterfly populations to historic averages to ensure successful continuation of annual migrations; and (3) increasing and maintaining cumulative pollinator habitat acreage in critical regions of the country. Numeric outcome metrics are quantified in **Table 1**.

Table 1. Overarching Pollinator Health Outcome Metrics

1. Honey Bees: Reduce honey bee colony losses during winter (overwintering mortality) to no more than 15% within 10 years. This goal is informed by the previously released Bee Informed Partnership surveys and the newly established quarterly and annual surveys by the USDA National Agricultural Statistics Service. Based on the robust data anticipated from the national, statistically-based NASS surveys of beekeepers, the Task Force will develop baseline data and additional goal metrics for winter, summer, and total annual colony loss.[a]
2. Monarch Butterflies: Increase the Eastern population of the monarch butterfly to 225 million butterflies occupying an area of approximately 15 acres (6 hectares) in the overwintering grounds in Mexico, through domestic/international actions and public-private partnerships, by 2020.
3. Pollinator Habitat Acreage: Restore or enhance 7 million acres of land for pollinators over the next 5 years through Federal actions and public/private partnerships.

[a] Based on the success of research, it is hoped that overwintering losses would be further reduced to pre-Varroa mite levels.

The outcome metrics identified in **Table 1** address the President's directive to expand Federal efforts to reverse pollinator losses and to help restore populations to healthy levels. Due to the critical importance of pollinators to the economy, including to agricultural production[2] and general ecosystem services, the ultimate objective of the Task Force is to ensure a level of pollinators that would sustain agricultural production and protect the health of the environment for the foreseeable future. In that context, the Task Force's first target outcome is to improve honey bee population health by reducing honey bee winter losses by no less than 50% from current levels, which have averaged around 30% nationwide over the past 5 years (Steinhauer *et al*. 2014), to a sustainable 15% loss rate within 10 years (by 2025). This reduction in the 5 year average of winter losses would be accomplished in stages: (1) by 25% (*i.e*., to a 22% colony loss rate) by 2020; and, (2) by a total reduction of 50% by 2025. This overall reduction to 15% yearly winter losses would restore an economically sustainable system for beekeepers and growers who depend on pollination services. This is an ambitious goal and the Task Force recognizes that yearly fluctuations due to the impacts of unknowable and difficult-to-mitigate variables (*e.g.,* drought, severe winter weather, or new bee maladies) may result in losses in a given year that are higher than the target average. The Task Force also acknowledges, based upon ongoing research discussed in the PRAP (2015), the possibility of further reductions, perhaps to pre-Varroa mite levels.[3]

Summer losses also lead to cumulative economic stress on beekeepers, notably the 2014–15 preliminary colony loss results from the Bee Informed Partnership. In summer 2014 (April–October) the colony loss rate was reported at 27.4% among a subset of national beekeepers responding to the survey. Combined with overwintering losses, the total annual colony loss (April 1, 2014–March 30, 2015) was 42.1% (Steinhauer et al. 2015). Overwintering mortality data are based on a different survey respondent pool, and for 2014–15 overwintering mortality was reported at 23.1%. The summer and annual colony loss data were first included in the Bee Informed Partnership survey in 2010–11.

The Task Force's second target outcome is to increase the Eastern population of the monarch butterfly to 225 million butterflies occupying an area of approximately 15 acres (6 hectares) in the overwintering grounds in Mexico by 2020. This goal represents the approximate average winter population level from 1994-2014 and also assumes an estimated density of 37.5 million butterflies per hectare. The Eastern monarch population has experienced a significant decline over the past 20 years. The 2014-2015 overwintering count of 56.5 million butterflies for the Eastern population was the second-lowest count on record, representing a population decline of 82% from the 20-year average. The occupied overwintering habitat in 2014-2015 measured only 2.8 acres (~1.1 hectares).[4] The Task Force views a target of 225 million butterflies occupying an area of approximately 15 acres (6 hectares) for the Eastern migration

2. Honey bees alone are estimated to support the cultivation of 90 – 130 crops which directly or indirectly account for up to a third of the U.S. diet (Bond et al. 2014).

3. Winter colony loss has averaged 28% nationwide over the last five winters for which we have data (2009-2010 to 2013-2014. Estimates from the Bee Informed Partnership, www.beeinformed.org), compared to an estimated average annual loss of 15% prior to the arrival of the Varroa mite in 1987 and the sharp rise in Colony Collapse Disorder in 2006. Prior to 2006, there was no coordinated effort to collect data on winter survival nationwide. Estimates of 15% colony loss prior to 1987 are anecdotal from beekeepers and bee researchers. In 2006, the Bee Informed Partnership began collecting data on winter losses, as well as data on winter losses from beekeepers who felt their losses were "acceptable." Since 2006, the average self-reported rate of acceptable losses is 15%.

4. Data from Rendón-Salinas, E., A. Fajardo-Arroyo, and G. Tavera-Alonso. 2014. Forest surface occupied by monarch butterfly hibernation colonies in December 2014 World Wildlife Fund – Mexico report. Available from https://www.worldwildlife.org/publications/forest-surface-area-occupied-by-monarch-butterfly-hibernation-colonies-in-december-2014.

as the best indicator of holistic species health. The Task Force is also mindful of the importance of the Western population in maintaining species viability across the continent.

The Task Force's third target outcome, restoration and enhancement of 7 million acres of pollinator-friendly habitat, addresses the importance of providing new and diverse nectar and pollen resources for honey bees and wild pollinators, including the monarch butterfly. Restoration of habitat is defined as the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning the majority of natural functions to the lost or degraded native habitat (16 USCS §3772 (5)); whereas habitat enhancement is defined as the manipulation of the physical, chemical, or biological characteristics of an undisturbed or degraded site to heighten, intensify, or improve specific functions or to achieve a specific purpose. As such, habitat enhancement represents a more targeted effort.

The habitat target outcome is based on preliminary expert estimates regarding the need to offset annual losses of pollinator habitat, plus provide additional acres to reverse past losses. These estimates are preliminary until comprehensive peer-reviewed literature becomes available to quantify the total magnitude of habitat losses, or needs for recovery. The estimates will be refined to reflect the findings of ongoing research in the PRAP (2015) to better measure pollinator status and acreage needs, and to identify those land areas and corridors most valuable and amenable to enhancement or restoration. For instance, the U.S. Geological Survey (USGS) Powell Center is working to identify habitats and corridors most valuable for directing resources for conservation of the Eastern population of the monarch butterfly, and the USDA is focusing Conservation Reserve Program (CRP) and Environmental Quality Improvement Program (EQIP) resources on the five upper Midwest States (South Dakota, North Dakota, Minnesota, Wisconsin, Michigan) that are central to honey bee summer forage. All actions will be subject to adaptive management as this research becomes available, in recognition of the fact that reversing pollinator losses is a long-term process requiring the incorporation of pollinator health considerations in routine agency and private-sector actions, rather than a one-off solution.

The habitat target outcome is also consistent with actions included by agencies in this Strategy. These actions include, but are not limited to: USDA resources applied to CRP and EQIP pollinator enhancements, and national forest and grassland acreage; DOI actions to restore or enhance lands through direct restoration action, along with the inclusion of pollinator-friendly native seeds in all post-fire revegetation and fuels/green stripping projects; U.S. Army Corps of Engineers (USACE) implementation of pollinator best management practices at its facilities; and numerous other actions itemized by Federal agencies to increase pollinator habitat. Federal agencies will also be working with the private sector to improve pollinator habitat on lands not managed by the Federal government, including state- and locally-managed lands, such as parks and highway rights-of-way, and privately-owned lands ranging from home gardens to corporate and philanthropically-sponsored acreage. The target outcome anticipates that fifty percent of acreage improvement will be sourced from Federally-managed lands, and fifty percent through working with partners to create or enhance habitat on state, locally-managed, and private lands.

Measuring Success

To achieve these target outcomes, each relevant action undertaken by a Federal agency will also include a timeline and metrics for evaluating the success and progress toward achieving one or more of these target outcomes. As the science developed through the Pollinator Research Action Plan (2015) matures, adjustments and/or enhancements to Federal actions and overarching goals and target outcomes also may be warranted. With expanding implementation of the Strategy, and as partnership efforts continue to grow, additional metrics and measures will be added to aid in assessing the success of the Strategy.

Periodic follow-up and reporting of agency performance is also vital in demonstrating to the public the Federal government's commitment to reversing pollinator declines and improving pollinator health. To this end, Task Force agencies are to report annually on all metrics to the Task Force Co-Chairs, who will publicly disseminate the results on an annual basis so that the general public can monitor the progress each agency is making in fulfilling the commitments detailed in this Strategy, including collaboration with public and private stakeholders.

Budget Requests for Pollinator Health

The actions contemplated in this Strategy are not occurring *de novo* or in a vacuum. Considerable Federal resources are already being directed toward honey bee, monarch butterfly, and other pollinator health-related issues, and a number of significant documents have investigated these issues. For instance:

- In 2007, the National Research Council published its report emphasizing risks posed to pollinator populations, stimulating further action.
- A Federal action plan for honey bees, the 2007 Colony Collapse Disorder Action Plan (USDA 2007), built on existing knowledge and resource bases within agencies.
- The 2008 North American Monarch Conservation Plan was developed by a team of experts from Canada, Mexico, and the United States under the auspices of the Commission for Environmental Cooperation (CEC 2008).

These efforts have proven insufficient to reverse declines, as demonstrated through the colony loss and butterfly population metrics. To boost Federal engagement with the increased resources necessary to combat the declines, the President's Budget request to Congress for Fiscal Year (FY) 2016 includes major increases over the FY 2015 Enacted Budget for honey bee and pollinator research and habitat improvement (**Table 2**). These budget requests are in addition to agency actions to redirect, focus, and coordinate existing resources toward this challenge. A number of such actions, including development of best management practices, are being highlighted in agency implementation plans.

The FY 2016 President's Budget (**Table 2**) includes over $82 million in funding ($34 million above FY 2015 enacted) for DOI, EPA, and USDA, specifically targeted to address pollinator health, including Colony Collapse Disorder. Other Federal agencies also contribute to pollinator health during the conduct of some of their programs and activities. Specific agency increased resources for pollinator health include:

Table 2. Pollinator-specific proposed Fiscal Year (FY) 2016 budget additions relative to the Enacted FY 2015 budget for DOI, EPA, and USDA ($ Million).

Agency	Program	FY 2015 Enacted	FY 2016 Budget	Change from 15 Enacted to 16 Budget
DOI	U.S. Geological Survey (USGS)	0.00	1.56	1.56
	DOI Total	0.00	1.56	1.56
EPA	Office of Pesticide Programs	0.00	1.50	1.50
	State and Tribal Assistance Grants	0.00	0.50	0.50
	EPA Total	0.00	2.00	2.00
USDA	National Agricultural Statistics Service (NASS)	2.40	2.90	0.50
	Agricultural Research Service (ARS)	14.19	21.19	7.00
	National Institute of Food and Agriculture (NIFA)	9.66	31.50	21.84
	Economic Research Service (ERS)	0.28	0.28	0.00
	Land Management Programs			
	Farm Service Agency (FSA) Conservation Reserve Program (CRP)	18.00	18.06	0.06
	Natural Resource Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP)	3.00	4.00	1.00
	Animal and Plant Health Inspection Service (APHIS)	1.00	1.00	0.00
	USDA Total	48.52	78.93	30.41
Agencies Total		48.53	82.49	33.96

- U.S. Department of the Interior: Includes $1.56 million in new funding for the USGS to support research priorities identified through the 2014 Presidential Memorandum on Pollinator Health, including the development of studies, monitoring programs, and decision-support tools for land and resource management agencies, and pollinator habitat models.
- U.S. Environmental Protection Agency: Includes $1.5 million to further the study of acute toxicity amongst honey bee populations and explore additional risk management options, and $500,000 to augment the work of states and tribes to develop pollinator protection plans.
- U.S. Department of Agriculture: Includes $56 million in research and associated statistical survey programs, including in-house research through ARS, agreements through APHIS, and grants (mainly through a competitive peer-reviewed process) through NIFA, with much of the funding going to land grant institutions to support local and regional pollinator issues at all levels (national, regional, and local), including organic production. Within USDA's suite of voluntary conservation programs, the budget continues to leverage funding within the Environmental Quality Incentives Program and to enhance Conservation Reserve Program covers to increase access to nutritious forage for pollinators in a targeted multi-state core area that is home to more than 65% of the Nation's managed honeybee population during the prime summer forage months (North Dakota, South Dakota, Minnesota, Wisconsin, and Michigan). It also continues

the FY15 budget proposal to monitor existing enrollment in CRP pollinator initiatives, document and quantify the benefits to honey bees and wild pollinators, identify ways to increase the pollinator benefits from CRP land, delineate core habitat areas, and determine the appropriate mechanisms to nearly double the CRP acreage enrolled in pollinator initiatives to 200,000 acres.

The Strategy

Each element of the Strategy is summarized in the following sections. Additional details on agency plans are available in the Appendices. Where specific goals have been identified, timelines for achieving these goals are also identified, as well as metrics for measuring progress. Metrics are expressed as qualitative and/or quantitative measures of progress that can be process-based (*e.g.*, activities directed at achieving a goal) or outcome-based (actual change) as a result of accomplishing a specified goal.

The Strategy includes the following components:

- Pollinator Research Action Plan;
- Plans for expanding education and outreach;
- Opportunities for public-private partnerships; and
- Improving pollinator habitat.

These components provide strong scientific foundations for Federal government action. Considering the public input received during two listening sessions hosted by EPA and USDA in fall 2014, the Federal government has identified a comprehensive set of research and "on-the-ground" actions that will serve as a significant initial effort to improve and ultimately restore pollinator health.

Pollinator Research Action Plan (PRAP)

The Presidential Memorandum called on the Federal government to draft a Pollinator Research Action Plan to include the following elements:

- Studies of the health of honey bees, other managed bees, and wild bees that assess stressors leading to species declines and Colony Collapse Disorder, as well as strategies for mitigation.
- Plans for expanding and automating data collection and data sharing related to pollinator losses, in partnership with the private sector.
- Assessments of wild bee and monarch butterfly population patterns, and modeling of the relationship of those population patterns to habitat variables.
- Development of affordable pollinator-friendly seed mixes and guidelines for evaluating their effectiveness in restoration and reclamation.
- Identification of best practices for minimizing pollinator exposure to pesticides, and new cost-effective ways to manage pests and diseases.
- Creation of strategies for targeting restoration efforts at areas that will yield the greatest expected net benefits for pollinator health.

The Task Force has prepared the "Pollinator Research Action Plan" (PRAP 2015) as a standalone document to accompany this Strategy. The proposed approach in the PRAP (2015) will enable a better understanding of individual stressors, as well as the cumulative influence of these stressors on overall health. Research needs fall into five main areas that overlap and interact to determine pollinator health:

- **Population trends and basic biology:** Assessing the status of pollinator populations requires inventories to establish baseline conditions, with subsequent monitoring and longitudinal studies to detect deviations from the baseline, and causes for those deviations. Priorities for managed bees include expanded quarterly and annual surveys of beekeepers, including questions on management practices and hive losses, and development of technologies to monitor hive health continuously. For wild pollinators, research must address species distributions, population patterns, and habitat use, which are poorly known for many species. These fundamental data can feed into models of the larger system of interacting factors affecting pollinators. Taxonomic capabilities to identify the thousands of North American bee species must also be increased.
- **Environmental stressors:** Many environmental factors have the potential to impact pollinator populations. Information is needed on individual stressors and how they may interact, particularly with regard to the sublethal impacts of pesticides and mite parasites. Research must focus on developing miticides for honey bees that can safely and effectively manage colony infestations. Information is also needed on how these individual stressors interact in real-world situations to cause declines in both honey bees and other pollinators. Best management practices for application to public and private lands require studies of multiple stressors and how they may interact. Collaboration with scientists internationally will add to the information base from which to assess these stressors under diverse conditions and habitat.

- **Land management:** Decisions on how to best manage lands are complex, driven not only by natural resources considerations, but by social and economic influences. Virtually every land management decision requires either implicit or explicit trade-offs among these elements. Decision-support tools are needed to help decision-makers understand and forecast the effects of decisions on pollinators, to assist in understanding the effects of these decisions on an array of values, and to refine best management practices for implementation across landscape types.
- **Habitat restoration:** Pollinator populations depend directly on plant populations, especially native plants. Effective habitat restoration must be appropriate for the desired pollinator species, affordable to establish in the short term, and self-sustaining in the long term. To create more and better pollinator habitat, research is essential to enable the identification of habitat with the highest potential for pollinator benefits, restoration of that habitat through appropriate seed mixtures, and monitoring of the habitat to enable adaptive management.
- **Knowledge curation:** Long-term monitoring and sound research require an extensive and well-curated knowledge base (*i.e.*, data sharing, interoperability, and informatics). This includes traditional data from individual specimens verified with their identification and geographic data, as well as data from emerging technologies such as whole-genome sequencing. The capacity to store information has expanded exponentially in recent years, and maintaining and sharing data that span many different levels of biological organization (*e.g.*, genomic to whole-population data) will aid in understanding patterns in decline and survival.

Together, these main areas represent the bodies of knowledge currently understood to be most critical to the recovery of pollinator populations in the United States and globally. The proposed research is built on a solid foundation of existing data from Federal agencies, as well as academic institutions. Task Force agencies will use emerging research findings to inform other actions in the Strategy, such as updates to BMPs for land management. Timelines for these activities are included in the PRAP (2015). Agencies will support PRAP (2015) activities through prioritization of existing Federal budgetary and staff resources, and collaboration with private sector activities.

Pollinator Public Education and Outreach

The Presidential Memorandum calls for "plans for expanding and coordinating public conservation and education programs outlining steps that Federal, state and private individuals and organizations can take to help address the loss of pollinators." This section of the Strategy outlines the means by which agencies are implementing, and will augment, this requirement to employ effective mechanisms and programs to engage the U.S. public and the broader global community in the health of pollinating species, and to encourage actions that will help restore pollinator populations in their native habitats. It provides guidance to Federal agencies and partners in stimulating public interest in pollinator conservation by identifying key internal and external audiences, crafting appropriate messages for those audiences, and ensuring effectiveness and relevancy of the techniques used to communicate.

The Task Force recommends coordination of a multifaceted portfolio of public education and outreach strategies intended to attract multiple audiences including, but not limited to: individuals; small businesses and corporations; schools, libraries, museums and other educational venues; demographically diverse audiences; organic certifiers; and Federal land management staff. A variety of education and outreach materials, programs, and media already exist to enlist the participation of these different audiences in actions that benefit pollinators. Where not available, materials will be developed by respective Federal agencies as part of these actions. These materials will be used to develop a set of core messages, talking points, and infrastructure as resources to support the efforts of public agencies and partners working on behalf of pollinators. Four core principles guide the scope of intended actions:

- Pollinator conservation is a shared national responsibility.
- The demographically diverse U.S. public requires customizable strategies of communication, education, and outreach. The key messages should be relevant to each target audience and well understood by multicultural audiences.
- The actions of a single person can make a difference—every citizen can contribute to pollinator conservation and should have the opportunity to become engaged in ways that are meaningful.
- Agencies involved in implementing the Presidential Memorandum should seek to educate and empower citizens as partners in pollinator conservation.

A key component for success is developing partnerships that foster public education and awareness pertaining to pollinator protection and habitat conservation, and leveraging existing resources and relationships. By implementing outreach actions and developing appropriate media, Federal agencies will work collaboratively with the private sector to actively engage existing and new partners in pollinator stewardship. Long-term implementation rests heavily on expanding these public-private partnerships to amplify messaging and reach the scale and longevity necessary to effect change. To achieve these ends, outreach and education partnership development will be a central component of the recommended future Partnership Action Plan to be developed and implemented by the Task Force over the next six months (below).

Current agency activities and commitments to advancing the Presidential Memorandum include:

- **Development of an interagency pollinator outreach toolkit:** The National Park Service (NPS) will take the lead in developing an interagency pollinator public outreach toolkit, which will include templates for news releases, posters, event protocols, and brochures, developed in collaboration with, and available to, other Federal, state, and local agencies and tribal governments. The toolkit will include a standard template with basic messages about pollinators, which can be customized with photos and place-specific information. Interpretive sign templates with standardized pollinator messages will be made available for agencies to customize for use in areas surrounding stewardship activities, at restoration sites, and at visitor centers. NPS will also host citizen science activities, such as a pollinator themed nation-wide Biodiversity Discovery Events (Bioblitz) in as many as 200 NPS parks/units, establishing new pollinator-centric projects with NPS Biodiversity Youth Ambassadors for their schools and communities, and incorporating pollinator citizen science and monitoring projects into the NPS Migratory Species Initiative.
- **Connection of school communities to pollinator education and habitat resources:** U.S. Department of Education Green Ribbon Schools (ED-GRS) was created in 2011 to inspire schools, districts, and institutions of higher education (IHE) to strive for excellence by highlighting exemplary environmental practices and resources that all can employ. ED-GRS recognizes progress in reducing environmental impact and costs, improving the health and wellness of schools, students, and staff, and providing environmental education. ED has awarded over 280 schools, districts, and post-secondary institutions in the first four years of the recognition award (2012–2015). Nearly all of the schools have native plant gardens, food gardens, pollinator gardens, certified wildlife habitats, and/or Monarch Waystations.[5] ED will further the Presidential Memorandum by adding, to its Green Strides pages, resource links and webinars offered by Federal agencies or non-profits that focus on advancing schools' work to plant native pollinator gardens. Through the use of its newsletter, social media, and Green Strides resources and webinars listings, ED will communicate resources, awards, grants, and challenges to school communities. ED will collaborate with external pollinator non-governmental organizations regarding pollinator garden statistics in State submissions.
- **Engagement of youth and families in pollinator education programs:** USDA will distribute pollinator education materials and facilitate pollinator education programs through their specific supported programs, such as 4-H (Smith-Lever 3(b&c)), Agriculture in the Classroom (AITC), and other youth outreach efforts for use at the state and local level. The US Forest Service (USFS) will engage its Green Schools partners, with a primary focus on the nearly 4,000 Project Learning Tree GreenSchools!, to provide access to pollinator conservation curriculum-based materials and annual GreenSchools! or GreenWorks! grants, many of which will be focused on pollinator habitat restoration. Over 3,000 National Association of Conservation Districts (NACD) "Local Heroes: Your Hardworking Pollinators" materials, partially funded by USDA agencies, NRCS, NIFA and USFS, which contain national educational standards and STEM-based K-8 lesson plans, will be distributed to formal and non-formal educators to reach youth and families.

5. Monarch Watch Monarch Waystation Program http://www.monarchwatch.org/waystations/index.html

- **Expansion of public outreach to farmers and beekeepers:** USDA is working with multiple stakeholders (*e.g.,* Pollinator Partnership, American Beekeeping Federation, American Honey Producers Association, Project Apis m, the Almond Board of California, and the Honey Bee Health Coalition) to leverage partnerships to make the most impact for improving the health of pollinators. As detailed in the Land BMPs, the USFS and the DOI Bureau of Land Management (BLM) are reaching out to stakeholders (*e.g.*, beekeepers, growers, and land managers) regarding opportunities to forage honey bees on managed lands. USDA will be executing memoranda of understanding where appropriate and providing webinars to increase understanding of its programs and the benefits to pollinators. USDA-NRCS has developed brochures and posters to help the public understand the challenges facing bees, as well as the opportunities for conservation support on working lands. NRCS has also partnered with other Federal agencies and the National Association of Conservation Districts, leveraging resources to develop joint pollinator education and outreach materials for STEM-based K-8 lesson plans and Stewardship Week 2015. NIFA provides grants to universities, including Land-Grant institutions, to address high priority research, and also works with U.S. Land-Grant institutions and counties through the Cooperative Extension System (eXtension; http://www.extension.org/ bee_health) to conduct information and technology transfer to stakeholders on pollinator health. USDA will disseminate information through this system and will initiate a national interactive web site where USDA scientists, university research institutions, State Agricultural Experiment Stations (SAES), county extension offices, organic certifiers, and others can share examples of research findings, success stories, best management practices, and other ideas. Outreach will also be conducted to farmers and beekeepers through the state and tribal efforts to develop managed pollinator protection plans.
- **Expansion of participation in National Public Lands Day:** National Public Lands Day (NPLD), organized by the National Environmental Education Foundation, is the nation's largest single-day volunteer effort for public lands. More than 175,000 volunteers and park visitors celebrate at more than 2,000 public land sites in all 50 States, the District of Columbia, and Puerto Rico. In 2014, NPLD volunteers: collected an estimated 23,000 pounds of invasive plants; built and maintained an estimated 1,500 miles of trails; planted an estimated 100,000 trees, shrubs, and other native plants, many of which are pollinator-friendly; removed an estimated 500 tons of trash from trails and other places; and contributed an estimated $18 million through volunteer services to improve public lands across the country. Seven Federal agencies (DOD, USACE, EPA, FWS, USFS, BLM, NPS) as well as nonprofit organizations and state, regional, and local governments participate in this annual day of caring for public lands. NPLD 2015 will take place on Saturday, September 26.
- **Create a unified campaign for National Pollinator Week:** National Pollinator Week is scheduled for June 15-21, 2015. Pollinator Week was initiated and is managed by the Pollinator Partnership, of which many Federal agencies are members. Eight years ago, the U.S. Senate's unanimous approval and designation of a week in June as "National Pollinator Week" marked a necessary step toward addressing the urgent issue of declining pollinator populations. Pollinator Week has now grown to be an international celebration of the valuable ecosystem services

provided by bees, birds, butterflies, bats and beetles. In 2014, pollinator proclamations were signed by the U.S. Secretary of Agriculture, U.S. Secretary of the Interior, and forty-five State Governors. Federal agencies will further expand their participation in National Pollinator Week through events that highlight and share the importance of pollinators including bees, birds, butterflies, and bats.

- **Outreach and education at the Smithsonian Institution:** The Smithsonian Institution (SI) provides public education through a variety of major exhibits with a key focus on pollination. These exhibits include the Butterfly Pavilion, Insect Zoo, and Butterfly Garden and Urban Habitat at the National Museum of Natural History (NMNH). Visitors are provided with signage and educational programs at Garden Fest and Pollinator Week, as well as regular garden tours that highlight the Butterfly and Bird Habitat Gardens. As part of SI's new pollinator-related outreach and education efforts, SI volunteers who interact with museum visitors will receive additional training on pollinators. Youth programs, high school internships, and the Q?rius ("curious") Youth Volunteers program will include information on pollinators under the mentorship of SI scientists, including the opportunity to conduct pollinator-related research and communicate their findings to the public. The web-based Smithsonian Transcription Center relies on internet citizen volunteers to transcribe digitized specimen labels from the SI collections. NMNH will hold crowd-sourcing events to transcribe the recently digitized bumble bee collection records, which represent baseline data on the distribution of bumble bees over the last century. Of the extensive insect collections, 46,000 bumble bee (*Bombus*) specimens are in the process of being digitized and 5,000 honey bee (*Apis mellifera*) specimens are slated to be digitized beginning in 2015. NMNH will use a global transcription event organized across natural history museums around the world to promote bumble bees as important pollinators. With Smithsonian Gardens and the National Zoo, NMNH will expand programming for Pollinator Week and integrate messaging related to the campaign. A significant digital outreach component is on-site at NMNH, which includes a Butterfly Pavilion Facebook page as well as opportunities to promote research and programs on the main NMNH Facebook, Twitter, Instagram accounts and blogs. SI's Encyclopedia of Life (EOL) is partnering with the Global Biotic Interaction project to build TraitBank (http://eol.org/traitbank), an open platform for biotic trait and association data (derived from museum specimens, citizen science observations, and the literature) used for modeling species interactions.
- **Training future pollinator scientists:** The National Science Foundation (NSF) funds basic research in science and engineering through competitive merit review of grant proposals submitted primarily by American universities and research institutions. NSF pollinator-focused research comprises over 250 currently funded projects, totaling over $113 million. Of these projects, most (175 awards) are in the biological sciences, with many focusing on pollinator systems. These include the interactions of plants and their pollinators, changes in pollinator communities in agricultural and natural landscapes, and biodiversity of key pollinator groups in the United States and around the world. Other funded projects address: the basic biology of insect, bat, and bird pollinators; new tools to aid in the study of pollinators, such as better predictive models to monitor butterfly distribution and migration; new tools to digitize museum

collections of pollinators; and studying ecosystem services, such as insect control provided by bats and other pollinators. All of these NSF-funded science research projects include broader efforts aimed at training the next generation of scientists and/or educating the public, as well as expanding the knowledge base with respect to pollinators and their environment. Specific funding for education projects include a film about butterfly migration for the Maryland Science Center and Project Budburst, a component of the National Earth Observation Network (NEON), which encourages citizen scientists to collect and share data on the timing of plant flowering.

- **Provision of staff education on Federal pollinator guidance documents and resources:** Effective pollinator protection at Federal buildings requires GSA to educate key staff on best practices and underlying scientific dynamics embodied in guidance documents. GSA has provided training webinars to staff on sustainable land development and design via the Sustainable Sites Initiative (SITES) and the Lady Bird Johnson Wildflower Center. The agency now has an additional agreement with the Director of the U.S. Botanic Garden to develop and provide GSA with a learning module on pollinator basics for design and construction professionals. This will allow GSA professional design staff to become educated on the subject as part of their annual continuing education requirements to maintain accreditations by the American Society of Landscape Architects (ASLA), American Institute of Architects (AIA), and American Planning Association (APA).
- **Advancement of international public diplomacy on pollinators:** The Department of State will complement and amplify existing and future on-the-ground actions with pollinator-themed social media. Starting with the rollout of the Strategy, U.S. and overseas diplomatic missions' social media platforms will be used on a weekly and monthly basis, respectively, to reach and influence a global audience about the U.S. government's perspectives on the importance of pollinators to biodiversity, food security, and sustainable development globally.

Metrics for Pollinator Public Education and Outreach:

National Park Service (NPS)

- Completion of interagency pollinator public outreach tool kit by summer 2015.
- Documentation of number of parks/units engaged in BioBlitz.
- Documentation of number of schools incorporating pollinator citizen science/monitoring projects.

U.S. Department of Education (ED)

- ED will update its Web resources with pollinator information by June 2015. ED will post outreach materials to its 15,000 Green Strides recipients as requested, consistent with ED policies and statutory responsibilities.

U.S. Department of Agriculture (USDA)

- Initial materials to increase public understanding of USDA programs and how they benefit pollinators will be developed and completed by USDA by June 2015.
- National interactive web site will be operative by September 2015.

Smithsonian Institution (SI)

- SI will document the number of visitors to pollinator facilities.
- SI will measure progress in building and expanding the public DNA Barcode Library that holds data for pollinating taxa and flowering plants by monitoring the number and diversity of DNA barcode records representing native plants and pollinating animals that are added to the DNA Barcode Library each year.
- SI will measure progress on the TraitBank initiative by tracking how many pollinating species and host plant species are added to Encyclopedia of Life (EOL) and the number of species association data modeled.

National Science Foundation (NSF)

- NSF will document the numbers of research awards related to pollinators.

General Services Administration (GSA)

- Complete the learning module on pollinator basics for design and construction professionals; training anticipated to be completed by end of the third quarter of FY15.
- Document the number of training webinars to staff on sustainable land development and design; document the number of staff trained.

Federal participation in National Public Lands Day

- Task Force agencies will estimate the number of pollinator-specific activities conducted as part of NPLD. Participating agencies include DOD, USACE, EPA, FWS, USFS, BLM, and NPS.

Department of State (DOS)

- Document the reach of DOS pollinator-themed social media to reach and influence a global audience about the U.S. government's perspectives on the importance of pollinators to biodiversity, food security, and sustainable development globally.

Public-Private Partnerships

The value of leveraging Federal investments through public-private partnerships has been a basic tenet of the Obama Administration. All aspects of the response to the pollinator health issue have the potential for partnerships, whether planting pollinator gardens with seed provided by companies, enlisting farm and forestry organizations, or encouraging the expansion of pollinator habitat on working lands. These opportunities build on the many existing partnerships already in motion in response to the NRC (2007) report and existing honey bee action and monarch butterfly conservation plans and independent efforts.

White House engagement in partnership opportunities to benefit pollinators began with an April 2014 invitation and meeting in the Eisenhower Executive Office Building among stakeholders. Evident from this meeting was a broad and enthusiastic recognition of the need for coordinated action on pollinator health across state and local government, beekeepers, academia, farmers, environmental groups, industry, and philanthropic organizations. This enthusiasm and willingness to contribute was further evident on release of the Presidential Memorandum, and at two listening sessions held in November 2014 by EPA and USDA that provided further opportunities for public engagement.

Indeed, the number, intensity, and variability of interested stakeholders mirrors the complexity and scale of the problem of restoring pollinator health. This diversity highlights the importance of coordination among partnership efforts to sustain this endeavor over the long-term, prevent duplication of effort, facilitate entry of new participants, and retain momentum. This coordination can leverage and enhance the critical work of the network of partners seeking to work together to meet the President's request for an all-hands-on-deck approach.

The Task Force strategy to facilitate partnerships both identifies and supports existing core stakeholder collaboration, while encouraging new collaborations where appropriate. The goal is to make it easy for new parties to participate, without reinventing existing coordination pathways and activities. This partner engagement structure includes:

- **Coordination of activities within the Federal government** through the Pollinator Health Task Force, in cooperation with the Trilateral Committee for Wildlife and Ecosystem Conservation and Management (United States, Mexico, Canada).
- **Coordination with non-Federal entities** through existing arrangements led by various Task Force agencies and reporting back to the Task Force. These existing arrangements include close liaison with state, local, and tribal governments, and through national and regional associations that represent stakeholder groups and routinely interact with related Federal agencies. Examples include the American Association of State Highway and Transportation Officials (AASHTO), Edison Electric Institute (EEI), National Association of Conservation Districts (NACD), etc.
- **Facilitation of a limited number of new partnership arrangements,** but only where gaps in existing partnerships and infrastructure have been identified. A prime example is the initial sponsorship by the FWS of the National Fish and Wildlife Foundation (NFWF) Monarch Butterfly Conservation Fund that enables private-sector conservation efforts. This fund provides an opportunity for engagement by industry, philanthropy, and citizens for independent, well-

vetted, and readily-implemented actions to support monarch butterfly conservation. Similar activities are underway through the Pollinator Partnership-coordinated North American Pollinator Protection Campaign, and with the Honey Bee Health Coalition on further engagement of the agricultural community and industry in improving pollinator health. The USDOT and FWS will explore new opportunities to promote habitat near the Interstate-35 corridor, in close cooperation with the states, to promote pollinator habitat conservation and pollinator health.

The need for these partnerships emphasizes the original principle in the Presidential Memorandum for a collaborative approach to changing the fundamental understanding of pollinators, the ecosystem services they provide, and the need for an "all hands, all lands" approach to effectively manage pollinator health.

Partnership coordination is necessary for each of the research, education, and habitat components of the Presidential Memorandum. Research activities are being coordinated among Federal scientists and partners in academic institutions as well as the private sector. Outreach is also continuing and expanding on public-private partnerships to promote the adoption and implementation of practices that benefit pollinators and their habitat, provide assistance in transitioning to more sustainable land management practices, and increase the public's understanding of the role of pollinators and their contributions to the economy and a nutritious and secure/sustainable food supply.

The Federal government is also participating in international efforts to understand and mitigate factors associated with pollinator declines, through organizations such as the:

- Organisation for Economic Cooperation and Development (OECD) Pesticide Effects on Insect Pollinators
- Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)
- International Commission on Plant-Pollinator Relationships (ICPPR)
- Colony Loss (COLOSS) Network
- Food and Agriculture Organization (FAO)
- International Union for Conservation of Nature (IUCN) Bumblebee Specialist Group.

States and local municipalities offer the first options for partnership opportunities, through complementary and shared responsibilities for land and species management, and through their expertise and implementation opportunities on the ground. States and municipalities have central roles in many of the habitat activities noted above. The Presidential Memorandum places particular emphasis on working with states to increase consideration for pollinators in their planning actions.

- **Addressing pollinators in State Fish and Wildlife Plans:** The FWS is partnering with the Association of Fish and Wildlife Agencies (AFWA) and encouraging states to include pollinators and the monarch butterfly as Species of Greatest Conservation Need in their State Wildlife Action Plans (SWAPs). FWS is providing tools to assist states in expanding education and understanding of pollinator conservation, and the value of including pollinators in SWAPs. Doing so will allow states to use a portion of their State Wildlife Grant funds for direct pollinator conservation. States

are required to update their SWAPs by October 2015 (this date is not related to the Presidential Memorandum, but required to receive FWS State Wildlife Grant funding). The 2015 State Wildlife Grant competitive program is offering an additional funding opportunity for states to address pollinators in their SWAPs.

- **Pollinator friendly native vegetation at cleanup sites:** EPA works with states, communities, and responsible parties to assess and clean up contaminated sites. In 2009, EPA issued new Principles for Greener Cleanups that not only protect human health but also allow communities and other stakeholders to promote beneficial, protective, future uses of the property. These green remediation principles include consideration of five elements: energy use, air pollutant emissions, water use, materials management, and land management/ecosystems protection. Pollinator-friendly native plantings can be incorporated in landfill coverings to achieve these goals. For example, 25 acres of contaminated land at Barksdale Air Force Base in Louisiana were seeded with native, drought-resistant wildflowers, following an initial cover with grass for surface erosion control. This action saves $1,800 each year in fuel and labor costs as native plant species need infrequent moving. EPA will expand opportunities for pollinator-friendly plantings in green remediation and green infrastructure activities, commencing with a renewed emphasis on pollinator-friendly planting opportunities in green remediation reference materials and policies.
- **Task Force Partnership Action Plan:** Recognizing the scale and scope of the partnership challenge, the Task Force will prepare a new Partnership Action Plan to implement this Strategy. The Plan will build on and amplify the many Federal actions advanced under the Presidential Memorandum, by increasing linkages and coordination with, and support for, complementary state and private-sector actions. The Plan will also address means to expeditiously expand pollinator health initiatives to achieve the scale necessary to make meaningful and long-term changes, and ways to institutionalize these changes into business models and public understanding. Coverage will include research, education, and habitat opportunities, and will include significant public engagement.

Metrics for Public-Private Partnerships:

Federal Task Force

- The Partnership Action Plan to implement this Strategy will be submitted to the Task Force by the end of calendar year 2015.

Department of the Interior (DOI)

- Document fiscal year percent State Wildlife Action Plans (SWAP) funds used by states in addressing pollinator and monarch conservation planning and education, beginning in October 2015.

Environmental Protection Agency (EPA)

- Document the number of acres of pollinator-friendly cover at EPA-managed remediation sites.

Increasing and Improving Pollinator Habitat

Habitat quality and quantity are central to the health of pollinator populations and ecosystems, and to the well-being of our society that is dependent on these resources. The Presidential Memorandum specifically emphasizes the Federal role in expanding and improving pollinator habitat, both directly through the large variety of facilities and acreages of land managed by the Federal government, and indirectly through the leadership role that Federal agencies can play in interactions with states, localities, the private sector, and citizens. Of central importance to empowering long-term change is the modification of guidance documents that influence Federal actions, where small changes to existing practices can lead to long-term benefits. For instance, many agencies have landscaping and facilities-management contracts, which can often be modified to encourage native pollinator habitat, providing long-term benefits without impacting agency missions or requiring additional budget.

The Federal actions laid out below establish a long-term process to incorporate goals to achieve pollinator health into land management strategies. Agencies will implement this long-term objective through a combination of initial habitat actions by agencies, supplemented by research actions to:

- improve targeting of interventions;
- review the efficacy of land management actions; and,
- engage in adaptive management strategies.

Recognizing the scale of this endeavor and the many and varied opportunities available to all agencies, the Presidential Memorandum is structured to highlight certain agencies to serve as models for broader adoption, a recommendation that is reflected in this Strategy.

The Presidential Memorandum also includes a general provision that all Federal agencies implement pollinator habitat action on managed lands, in addition to where specified agencies are to pave the way toward expanded implementation. For ease of understanding, these habitat opportunities are categorized below under specific topics that cover:

A. Improving the quality and quantity of overall acreage for pollinators;

B. Expanding pollinator habitat on rights-of-way;

C. Strengthening Federal guidance documents to increase pollinator habitat;

D. Increasing habitat quantity and quality on Federally-managed facilities; and,

E. Creating a native seed strategy and reserve.

The activities listed below highlight these exemplary activities by Federal agencies, structured under general habitat management activities rather than by agency. Additional details are available in the individual agency pollinator plans prepared in response to the Presidential Memorandum (see Appendices).

A. Improving the Quality and Quantity of Overall Acreage for Pollinators

The Federal government is the largest land manager in the Nation and through its programs can also influence private-sector actions. Habitat actions on Federal lands focus on optimizing the use of existing personnel and budgetary resources, recognizing that in many situations improved pollinator habitat is a budget-neutral process. Habitat actions can even be financially beneficial due to the lower costs realized from reduced mowing and maintenance necessary for native vegetation. In particular instances, such as the need to stimulate immediate action to increase honey bee and monarch butterfly numbers, existing agency financial resources have been redirected and requests made in the President's FY16 Budget for additional resources. The efforts listed below are also intended to align with state, private sector, and philanthropic resources and activities. Combined, these efforts will help increase pollinator habitat across the United States and contribute substantially to crop pollination on farms where habitat needs are met.

- **Document and expand Conservation Reserve Program (CRP) benefits for pollinators:** The USDA Farm Service Agency (FSA) administers the Conservation Reserve Program, which implements long-term rental contracts with farmers to voluntarily remove environmentally-sensitive land from agricultural production, and to plant species that will improve environmental health and quality. The long-term goal of the program is to re-establish valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat. CRP has over 24 million acres currently enrolled nationwide, including more than one million CRP State Acres for Wildlife Enhancement (SAFE) and other continuous CRP practices that provide enhanced pollinator habitat with diverse cover types. FSA will review its CRP practices to identify those practices that already are beneficial to wild pollinators and managed bees, and where additional pollinator plantings can be included.
- **Increase the dedicated CRP pollinator acres:** FSA has over 124,000 acres currently enrolled in a special CRP category for enhanced pollinator habitat practice (CP-42), and has allocated an additional 76,000 acres of land specifically for that practice. The practice includes planting native plant species and a variety of plants that flower at different times of the growing season to provide a diversity of pollen sources necessary for bee nutrition and health. In coordination with stakeholders, FSA is monitoring the effectiveness of CP-42 enrollments and other CRP practices to identify, document, and quantify the benefits to pollinators. Using this and other information from stakeholders, FSA will determine whether additional types of CRP pollinator acres and practices, including diverse plant species mixes or food plots more focused on honey bees or monarch butterflies, would be most helpful. Depending on stakeholder interest, FSA will work with NRCS to develop and implement such new practices or sub-practices.
- **Enhance existing CRP lands for pollinators:** FSA is working collaboratively with the NRCS to allow use of more-affordable pollinator-friendly seed mixes on CRP land. In 2014, FSA announced a new $8 million honey bee incentive to enhance CRP covers to make them more pollinator-friendly. CRP participants in five Midwestern States (MI, MN, ND, SD, WI), which are collectively home to more than 65% of summer honey bee hives, are being offered incentives to establish pollinator habitat on their CRP lands as a mid-contract management activity (see coordinated work in these five States with NRCS in the discussion below). This new option was

developed and made available in late FY14, although installation may take two seasons to implement since this work often involves significant land preparation. During FY15, outreach, including targeted materials to eligible CRP participants in the five-State area, will be completed in an effort to boost practice installation in FY15/16. The NRCS Plant Materials Program has pollinator forage demonstration field trials underway at many Plant Materials Centers across the United States, and is working with partners to increase the availability of important pollinator plant materials, including native milkweed species. Plant Materials Centers continue to study plant species to support pollinator habitat as well as to evaluate methods to improve the seeding, establishment, and management of pollinator plantings.

- **Provide emergency assistance for beekeepers (honey bee) to address losses:** The FSA plays a critical role in the delivery of programs that provide a safety net for beekeepers who experience losses due to natural disasters. The Emergency Assistance for Livestock, Honeybees and Farm-Raised Fish Program (ELAP) provides assistance for the loss of honeybee colonies, in excess of normal mortality, due to Colony Collapse Disorder or other natural causes. Approximately $28 million in payments were issued related to these claims in FY12 and FY13, combined. These funds are helping beekeepers rebuild their hives and remain solvent.

- **Update conservation practice standards for pollinators:** The Natural Resources Conservation Service has revised all applicable Conservation Practice Standards to include criteria for managed and wild bees and other pollinator habitat, and the Conservation Stewardship Program offers a pollinator habitat enhancement option. Several States, including Montana and South Dakota, target pollinators in Wetlands Reserve Program upland habitat restoration work. By the end of calendar year 2015, NRCS will have revised these standards and enhancements to include milkweed to improve monarch habitat where appropriate. In collaboration with the Xerces Society and academic partners, NRCS has revised and expanded plant lists and technical guidance documents for pollinator forage conservation. Some of these materials are posted online.[6] The NRCS Conservation Innovation Grants (CIG) program has supported several projects across the country designed to demonstrate the value of habitat for pollinators, as well as to expand and improve NRCS capacity to establish and monitor high-quality, permanent bee forage sites.

- **Target habitat improvements in priority honey bee summer forage areas:** Commencing in FY14, NRCS provided more than $3.2 million in technical and financial assistance to CRP participants in the five key Midwest States (MI, MN, ND, SD, and WI) to implement conservation practices that would provide diverse plant forage. This funding led to over 220 contracts on more than 26,000 acres. NRCS will make $4 million available in FY15 through EQIP for honey bee habitat in the same five Midwest States. Several NRCS state offices have also set aside additional funds for similar efforts, including California—where more than half of all managed honey bees in the United States pollinate almond groves and other agricultural lands—as well as Ohio and Florida.

- **Evaluate the efficacy of honey bee programs:** FSA and NRCS are partnering with the U.S. Geological Survey to study the impacts of joint honey bee efforts in the five Midwest States. In FY14 and FY15, NRCS provided a list of plant species recommendations for early/mid/late-season

6. http://plants.usda.gov/java/factSheet

blooms for diverse landscapes to provide optimal benefit for honey bees. The applied project is examining what plants honey bees rely on for pollen and nectar during different parts of the season, through a combination of pollen analysis and tracking the weight gain or loss of hives in different types of habitat (*e.g.*, comparing areas dominated by row crops vs. areas with significant CRP and pasture acreage). In FY15, the research is being expanded to study more sites across additional states to improve the ability to draw conclusions based on statistically significant relationships, along with a demonstration project focused on areas with orchards to look beyond the grassland/row crop habitats of the current study. USDA will continue to refine its seeding recommendations based on the findings of this work to ensure the provision of plants that are both cost-effective and of optimal benefit for honey bee health.

The Department of the Interior manages 500 million acres of lands, primarily located in the Western states, welcoming over 400 million visits to DOI managed lands each year for outdoor recreation and tourism, energy development, grazing, and timber harvesting. DOI land management bureaus are poised to play a significant role in establishing, restoring, and enhancing acres of pollinator habitat across the country.

- **Include pollinator friendly plants in land management programs:** The Bureau of Land Management is making major adjustments to land-management programs by incorporating native, pollinator-friendly vegetation as standard practice in common management practices on large parcels of land each year. These new policies will benefit pollinators through post-fire vegetation, fuels management, and green stripping (vegetation for fire breaks) activities on BLM lands. A major emphasis is the use of at least one pollinator-friendly native plant in all post-fire re-vegetation efforts and in all fuels and green stripping projects that include seeding. This action will be expanded through research and adaptive management to further expand the mix, scale, and amount of native seed use.
- **Invest in priority acreage to support conservation of the monarch butterfly:** The Fish and Wildlife Service is working with the governments of Mexico and Canada on a Tri-national Monarch Butterfly Conservation Plan. Domestic actions by the FWS include significant near-term investments to restore and enhance monarch butterfly habitat, which will be valuable to a suite of wild pollinators. In FY15, FWS has identified opportunities to restore or enhance more than 200,000 acres of monarch butterfly habitat through existing and planned projects on public and private lands, including support for 750 schoolyard habitats and pollinator gardens. Conservation will be delivered on FWS-owned lands, through partnerships on state-owned lands, and on private lands through the Partners for Fish and Wildlife and Coastal Programs. FWS will acquire more than 46,000 acres of land in the Midwest and Mountain Prairie Regions, which, although primarily aimed at protecting priority bird habitats, will have secondary benefits for monarchs and other pollinators. The FWS has also allocated an additional $2 million for priority projects in key geographic breeding and migration habitats focused on additional habitat restoration, native seed strategies, and education and outreach to target audiences. Many of the priority projects will focus on the I-35 corridor from Texas to Minnesota that provides spring and summer breeding habitats in the monarch's key migration corridor. FWS has also provided $1.2 million to the National Fish and Wildlife Foundation for the Monarch Conservation Fund

to be matched by private and public donors. The fund will provide the first dedicated source of funding for projects working to conserve monarchs.

B. Expanding Pollinator Habitat on Rights-of-Way

A right-of-way (RoW) is the "legal right, established by usage or grant, to pass along a specific route through grounds or property belonging to another."[7] Federal agencies have various relationships to RoW in the context of pollinator habitat, most often through easements on Federal lands for roads, rail, pipelines, powerlines, etc.; some needed by the government on private lands; and some RoWs completely within the purview of the private sector but influenced by the Federal government, whether through grant funding to states/localities, regulation, or potential Federal convening opportunities. RoWs are of particular interest for pollinator habitat because they constitute large land acreage on a cumulative basis, are generally maintained in sunny areas with low vegetation height (ideal pollinator habitat), and often extend for considerable distances, thereby potentially acting as corridors for species movement and adaptation to climate change. Exemplars in the Presidential Memorandum were identified to develop the technical basis and opportunities for improved pollinator habitat on RoWs, as a template for expanding implementation.

In achieving its mission to keep the traveling public safe, secure, and mobile, and to foster economic competitiveness and environmental stewardship, the U.S. Department of Transportation (USDOT) works closely with states, localities, and the private sector across a variety of transportation modes, including highways, railroads, aviation, pipelines, mass transportation, maritime routes, and the Saint Lawrence Seaway. The RoWs, facilities, and other properties necessitated by these transportation modes are in many instances not under direct USDOT control, but rather are managed by state and local entities or the private sector, consistent with USDOT promotion of best practices. USDOT is supporting the Administration's efforts to protect and enhance pollinator habitat as follows:

- **Prepare best management practices for pollinator habitat on highway rights-of-way:** The Federal Highway Administration (FHWA) has contracted to create a number of materials to support best management practices (BMP) for pollinator health in roadside vegetation management. The FHWA contractor has retained a non-profit organization specializing in invertebrate ecology to develop these materials. Based on the latest science in vegetation management and pollinator habitat, the BMP materials will provide transportation agencies with practical tools to promote increased pollinator habitat along roadways through improved plant material selection, mowing practices, and other roadside habitat maintenance practices. Deliverables for the BMP contract include: (1) a literature review of the latest scientific data on pollinator health and factors affecting pollinators to establish a foundation for BMP documents for transportation agencies (completed in January 2015 and currently under review for publication on the FHWA website); (2) a report on the state of practice for roadside vegetation management based on interviews with nine State departments of transportation (target completion: spring 2015); (3) a high-level report on BMPs for FHWA and State DOTs program, policy, and maintenance management staff (target completion: fall 2015); and (4) a detailed and practical BMP guidance document for State DOT field staff and contractors.

7. http://www.oxforddictionaries.com/us/definition/american_english/right-of-way

- **Distribution of e-book Vegetation Management: An Eco-regional Approach:** In 2013, FHWA published a limited number of hard copies of *Vegetation Management: An Eco-regional Approach*, which discusses regional vegetation management practices, native species recommendations, and other activities that support pollinator health within the context of specific eco-regions across the United States. The FHWA is developing the publication into an e-book for wider dissemination to State DOTs and other transportation stakeholders. The e-book will be publicly available on FHWA's website.
- **Participation in Plant Conservation Alliance:** In May 2014, FHWA signed a Memorandum of Understanding establishing the Federal Native Plant Conservation Committee of the Plant Conservation Alliance. The purpose of the Committee is to identify and recommend, as appropriate, priority conservation needs for native plants and their habitats, and to coordinate implementation of programs for addressing those needs.
- **Explore an Interstate-35 pollinator corridor effort with States and stakeholders:** The 1,500 mile I-35 corridor from the Texas border with Mexico northward to Minnesota is central to a number of Task Force efforts. From the southern end in springtime, monarch butterflies commence their annual northward migration through the central flyway traversed by the I-35 corridor, dispersing to the upper Midwest, and returning via this route in fall. In conjunction with the FWS, USDOT will work to convene a workshop of I-35 State transportation officials, partners, and organizations to reinvigorate efforts for prairie and pollinator habitat restoration along this corridor. The I-35 corridor would serve as a focal point for linking resources and coordinating actions. The objectives of this initiative are broad and encompass multiple land management approaches. The workshop objectives include sharing State DOT best practices and coordinating efforts toward a national monarch corridor. A priority objective is the identification of viable ways to supplement Federal, state, and local landscaping actions through the engagement of private sector and philanthropic resources. The workshop would also explore how USDOT transportation modes and stakeholders can support pollinator habitat enhancement, and will encourage state and local partners to identify opportunities for improving pollinator and monarch habitat along transportation rights-of-way, in local parks and public spaces, and other promising locations along the I-35 corridor.
- **Evaluate opportunities to encourage pollinator habitat on privately-owned and -operated facilities:** USDOT has worked with the Rails-To-Trails Conservancy and the American Society of Landscape Architects (ASLA) regarding information on pollinator-friendly landscaping design for transportation stakeholders in order to identify opportunities to promote pollinator health on unused rights-of-way. A number of the Department's modal websites will provide hyperlinks connecting visitors to additional resources promoting pollinator health and the planting of pollinator-friendly vegetation. Resources will focus on the role of the transportation sector in promoting pollinator health. Website links will navigate visitors to additional pollinator-related resources.

Metrics for Improving the Quality and Quantity of *Overall Acreage* for Pollinators:

Farm Services Agency (FSA)

- Complete a review of CRP practices in 2015 and revise Conservation Practice Standards as appropriate.
- Document total CRP acreage annually, including:
  - Document targeted pollinator acreage annually, and meet goal of 200,000 acres by 2018.
  - Document mid-contract enhanced CRP acreage and complete initial assessment of honey bee conservation pilot by 2016.
  - Document cumulative CRP acreage in targeted pollinator practices and other pollinator friendly practices (CP-42, mid-contract, SAFE, etc.) annually.
- Document ELAP expenditures for honey bee colony losses.

Natural Resources Conservation Service (NRCS)

- Document NRCS financial support to implement conservation practices to provide diverse plant forage in support of pollinators.
- Document the number of acres contracted under the EQIP to establish honey bee habitat.
- Document funding of annual innovation grant projects that demonstrate the value of habitat for pollinators, and to expand and improve NRCS capacity to establish and monitor high-quality, permanent, bee forage sites.

Department of the Interior (DOI)

- Document, by the end of FY15, the percent of BLM-managed lands employing post-fire vegetation, fuels management, and green stripping (vegetation for fire breaks) activities to rehabilitate agency lands that include native pollinator-friendly seeds; document actual pollinator enhanced acreage.
- Document the number of monarch butterfly habitat acres restored by the FWS; the number of acres acquired by FWS that provide monarch habitat; and the number of schoolyard habitats/gardens created on FWS owned lands or through FWS technical assistance.

Department of Transportation (USDOT)

- Complete pollinator BMP materials by February 2016 with a target date to make materials publicly available by spring 2016.
- Make vegetation management e-book publicly available by spring 2015.
- Conduct fall 2015 workshop to promote I-35 corridor conservation.
- USDOT will develop links on the USDOT website that will provide visitors access to additional resources promoting the role of the transportation sector in support of pollinator and monarch health by Pollinator Week (June 16-23, 2015).

- **Working with the Edison Electric Institute (EEI) and Electric Utilities on Transmission Line RoW Habitat:** The North American Electric Reliability Corporation (NERC) has delegated responsibility to develop and enforce standards to ensure the reliability of the bulk power system, including the Reliability Standard that addresses vegetation management covering tree trimming on high voltage transmission RoWs (FAC-003-2; residential power line maintenance is under the purview of state and local authorities). The transmission line requirements place strict responsibilities on operators that trees and other vegetation growing in or adjacent to a power line RoW be trimmed to prevent power outages caused by tree contact with a transmission line. These RoWs can be cost-effectively managed to offer prime pollinator habitat of low-growing grasses, forbs, and shrubs, using techniques such as Integrated Vegetation Management (IVM). A number of major public and private utilities have become exemplars of IVM practices to encourage pollinators. Federal agencies (EPA, USDA, DOI, DOE) are revising the existing Memorandum of Understanding with EEI to further these beneficial pollinator practices.

C. Strengthening Federal Guidance Documents to Increase Pollinator Habitat

Modifications to Federal guidance documents can engender long-term, often cost-neutral, changes whose benefits accrue over years and become part of routine business practice. Guidance documents and websites also offer the means by which staff can identify additional technical and personnel resources to inform actions. The Presidential Memorandum recognized that key changes to internal Federal guidances were needed, calling out three such guidance documents to address Federal habitat management actions, supplemented by a native seed reserve to provide regionally-sourced pollinator seed mixes. These Federal guidance documents increase in scale from building construction and maintenance (General Services Administration), to designed landscapes (Council on Environmental Quality), to broad land management activities (BLM, USFS, and others):

- **Federal Building Standards and Custodial Specifications:** The U.S. General Services Administration (GSA) provides the spaces, services, and goods required to operate the Federal government. GSA's Public Buildings Service (PBS) provides workplaces by constructing, managing, and preserving government buildings and by leasing and managing commercial real estate. PBS owns or leases over 8,700 assets, comprising approximately 377 million square feet of workspace for over 1 million Federal employees. GSA's Facilities Standards for the Public Buildings Service, the P-100,[8] provides design performance guidance to meet agency design goals. The P-100 laid the groundwork for policies to protect pollinator habitat through existing standards that promote the preservation of greenfields, protection of existing site trees and other vegetation, and use of non-invasive, native, or adapted vegetation. GSA has now added pollinator-specific guidance to the P-100, including practices to promote both nesting and foraging for regionally-appropriate pollinators on landscaped sites. GSA guidance also informs the management of agency facilities and landscapes nationwide, through a national custodial specification providing model contract language. GSA has added new pollinator-friendly guidance references to relevant custodial specification sections, such as Grounds Maintenance,

8. http://www.gsa.gov/portal/content/104821

that cross reference the new P-100 pollinator requirements and the CEQ Designed Landscape Addendum (below). GSA also establishes long-term, government-wide contracts with commercial firms to provide access to commercial products and services at volume discount pricing, *i.e.*, the GSA Schedule. GSA is establishing a schedule item for firms to provide landscape construction services to replace monoculture landscapes along rights-of-ways and other large designed acreages with native grasslands (*i.e.*, prairies and meadows).

- **Guidance for Supporting Pollinators on Designed Federal Landscapes:** The Federal government controls or owns more than 41 million acres of land and 429,000 building assets, comprising 3.34 billion square feet of space in the United States. Consequently, landscaping practices by Federal agencies can have significant impacts on the environment. Decisions regarding the development and maintenance of Federal landscaped property provide an opportunity to promote the sustainable use of these facilities, actions empowered by Executive Order 13514, now EO 13693, and implemented by CEQ in the October 31, 2011 *Guidance for Federal Agencies on Sustainable Practices for Designed Landscapes*. Pursuant to the Presidential Memorandum, CEQ issued an addendum to the sustainable landscape guidance entitled *Supporting the Health of Honey Bees and other Pollinators*.[9] This addendum guides Federal agencies in incorporating pollinator-friendly practices in new construction, building renovations, landscaping improvements, and in facility-leasing agreements at Federal facilities and on Federal lands.
- **Best Management Practices for Pollinators on Federal Lands:** Beyond buildings and designed landscapes, the Federal government manages, on behalf of the Nation, large expanses of lands, from forests, prairies, and parklands to grassed spillways and rights-of-way for roads, pipelines, and power lines. As required by the President, DOI and USDA have prepared a BMPs document that consolidates general information about practices and procedures for Federal agencies (*e.g.,* USDA, DOI, DOE, USACE) to use when considering pollinator needs in project development and management of Federal lands that are managed for native diversity and multiple uses. The BMPs (USDA/DOI 2015) are organized under three subject areas: (1) BMPs to improve pollinator habitat, (2) BMPs to protect pollinators when taking management actions, and (3) BMPs to protect and sustain specific pollinator species, notably honey bees and monarch butterflies. Selected references are provided, and readers are encouraged to access these as well as additional sources of information on the BMPs that they are interested in implementing.

9. http://www.whitehouse.gov/administration/eop/ceq/sustainability/landscaping-guidance

Metrics for Strengthening Federal Guidance Documents to Increase Pollinator Habitat:

General Services Administration (GSA)

- Draft P-100 standards were issued through a directive on September 18, 2014, and finalized following Public Buildings Service clearance in 2015. http://www.gsa.gov/portal/content/104821
- The number and percentage of new GSA buildings implementing each tier of the P-100 pollinator standard will be tracked.
- GSA schedule for firms to provide landscape construction services to replace mono-culture landscapes along rights-of-ways and other large designed acreages with native grasslands and clovers will be established.

Council on Environmental Quality (CEQ)

- The addendum to the sustainable landscape guidance, *Supporting the Health of Honey Bees and other Pollinators*, was issued on October, 2014.

Department of the Interior (DOI) and Department of Agriculture (USDA)

- Guidance document on BMPs to protect and sustain pollinators on Federal land completed and issued in May 2015 (USDA/DOI 2015).

D. Increasing Habitat Quantity and Quality on Federally-Managed Facilities

All Task Force agencies are addressing opportunities to review their facilities-management practices to increase pollinator habitat. These applications primarily implement the GSA building and CEQ designed landscape guidance documents, modified in certain instances by agency mission needs.

- **White House South Lawn Pollinator Garden and Beehive:** With the help of the National Park Service and White House staff, First Lady Michelle Obama led local school children and FoodCorps volunteers in planting the first White House Pollinator Garden on April 2, 2014. The garden is located next to the White House Kitchen Garden and beehive, illustrating the importance of pollinators to good nutrition. The Kitchen Garden, beehive, and pollinator garden have generated national interest through their prime location in one of the most photographed spots in the Nation, accompanied by continued engagement from the First Family.
- **Smithsonian Institution (SI) gardens:** The Smithsonian Institution oversees and manages approximately 7,000 acres of land within the United States. SI's iconic facilities in Washington, DC, host over 28 million annual visitors who join in the vision of preserving our heritage, discovering new knowledge, and sharing resources with the world. SI's strategic direction is to reduce turf and mulch areas in gardens and replace with appropriate native plantings to serve as educational and inspirational foci. SI has developed pollinator foraging habitat using native plants at the Smithsonian Garden's Butterfly Garden and Urban Bird Habitat at the National Museum of Natural History, and landscapes around the National Museum of the American Indian and the Cultural Research Center in Suitland, MD. The National Zoo has completed a rain garden,

butterfly garden, and native plant "Zoo in Your Backyard" to enthuse visitors with the benefits of native plantings in their own gardens. Outside Washington, the Smithsonian Environmental Research Center in Edgewater, MD has 2,200 acres of land that includes native species that are pollinator-friendly, and a newly constructed 4.65 acre wetland featuring pollinator-friendly aquatic plants. The Smithsonian Conservation Biology Institute in Front Royal, VA manages 200 acres of old fields, 400 acres of pasture, and 200 acres of hay fields, all of which are managed with pollinator-friendly plants. An additional 30 acres will be converted to native grassland using a mix of flowering native plants.

- **U.S. Department of Agriculture (USDA) People's Garden Initiative and Headquarters beehive:** On February 12, 2009, to honor Abraham Lincoln's 200th birthday, Agriculture Secretary Tom Vilsack declared the grounds surrounding USDA Headquarters in Washington, DC, to be the first People's Garden. This commenced a challenge to employees to create gardens at all USDA facilities, which has since expanded to a collaborative effort of over 700 local and national organizations working together to establish community and school gardens across the country. People's Gardens vary in size and type, but they must be collaborative community endeavors and should incorporate sustainable practices, including planting of native plants that sustain beneficial insects. All produce grown at a People's Garden on USDA-owned or -leased property is donated to help those in need.
- **The Department of the Interior (DOI) to develop guidance for pollinator-friendly facilities and lands:** DOI is drafting a landscaping policy to promote pollinators on all DOI-owned facilities and offices, covering organizations such as BLM, NPS, FWS, USGS, Bureau of Reclamation (BOR), Bureau of Indian Affairs (BIA), Office of Surface Mining Reclamation and Enforcement (OSMRE), and Headquarters Offices. DOI also manages a large and diverse range of lands for a variety of purposes, and many ongoing land management practices provide nesting substrate and food sources for a range of pollinator species. BLM is revising its Renewable Resource Treatments and Improvements manual to include the use of pollinator-attractive native plants in vegetation treatments and the use of best management practices, and is working to update stipulations for apiary permits on BLM lands.
- **The U.S. Environmental Protection Agency (EPA) to establish a comprehensive pollinator baseline at its facilities:** The EPA will complete pollinator site assessments at its owned laboratories nationwide, including an inventory of flora types, a listing of observed pollinator species, and a review of landscaping practices, resulting in the establishment of a comprehensive pollinator baseline. Additionally, the EPA will review existing landscaping contracts at EPA-owned laboratories to look for opportunities to institute more pollinator-friendly landscaping activities. The pollinator baseline will be used in tandem with master plans to drive future landscaping decisions that will further protect and expand pollinator communities at EPA-owned laboratories. These activities will culminate in establishing targets of opportunity in FY16 and the out-years at EPA-owned laboratories that protect and expand pollinator communities in accordance with the Presidential Memorandum. The EPA will also be collaborating with the General Services Administration in FY16 and out-years to seek opportunities to further protect and expand pollinator communities at GSA-owned/-leased and EPA-occupied properties nationwide.

- **Department of Defense (DOD) pollinator directives to facilities:** DOD manages a vast and varied array of property types that can contribute to pollinator health, covering 25 million acres of land and tens of thousands of buildings. To implement the Presidential Memorandum, DOD has built upon its existing land stewardship activities through orders, directives, guidance, and funding to increase pollinator habitat. DOD collaborates with the Pollinator Partnership to provide technical and programmatic guidance on pollinators and pollinator habitat implemented on DOD lands. Immediately following the Presidential Memorandum, DOD issued a memorandum to Military Services (September 2014) to reinforce the *DOD Policy to Use Pollinator-Friendly Management Prescriptions* and use native landscaping, when possible; avoid using herbicides and pesticides in sensitive habitats; and coordinate with other agencies and non-governmental organizations on habitat and pollinator issues. DOD will issue additional instructions that the Military Services track implementation of this policy, in addition to adding pollinator-friendly management language to DOD Instruction 4715.03, *Natural Resources Conservation Program*, which is DOD's primary policy document for natural resource management. DOD will issue additional technical and programmatic guidance to update the *Unified Facilities Criteria [UFC] for Landscape Architecture* (UFC 3-201-02), issued in February 2009, to include pollinator-friendly management practices in contractor design and construction projects. Pollinator protection and management will also be included in DOD's Natural Resources Strategic Plan, which provides broad goals and objectives for implementing natural resources conservation and management on DOD installations. From 2009–2014, DOD funded approximately 150 pollinator-related National Public Lands Day projects, and will continue to support these small projects (<$6,500) that provide tools and resources to volunteers.
- **The U.S. Army Corps of Engineers (USACE) to adopt land BMPs for pollinators on Corps recreational and fee owned projects:** The USACE is the steward of the lands and waters at 12 million acres of Corps water resources projects. The natural resources mission of the Corps is to manage and conserve these natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations. The primary focus of the Corps pollinator plan will be on fee-titled lands, although the plan shall be applied, as appropriate, to all Corps commands having responsibility for civil works functions. The Corps will:
  - **Issue policy guidance on pollinator health and management:** The Corps will identify existing policy and guidance and modify these for pollinator health, including access for commercial hives. These actions will include issuing a policy memorandum or similar guidance from Corps HQ Natural Resource Management Branch to Divisions, Districts, and Projects encouraging use of the Pollinator Land BMPs as part of normal operating principles during land management, and revising guidance of natural resource regulations when these are updated.
  - **Incorporate pollinator work within its budget guidance:** The Corps will provide guidance in the USACE Budget Engineer Circular and Environmental Stewardship Budget Tools to encourage pollinator habitat improvements. Other projects to benefit bees and wild pollinators will be identified and considered during the budget process, under the stewardship business line.

- **Identify USACE pollinator partnerships:** The Corps Stewardship Advisory Team will engage the Corps Partnership Advisory Committee to evaluate existing partnership tools, such as challenge partnerships and handshake programs, to determine how such tools could be appropriately used to improve pollinator health.
- **Increase awareness and education on pollinator actions:** The Corps will incorporate information on pollinator health in exhibits and displays for visitor education as appropriate, and will increase the pollinator habitat message into ranger contact materials when updates occur. The Corps will consider construction of pollinator gardens near visitor centers and other high-pedestrian traffic areas to promote healthy pollinator habitat.
- **Implement conservation and best management practices for pollinator health:** The Corps will implement the above listed Federal facility guidance documents and Land BMPs for pollinator habitat improvement at its facilities. A particular initial focus will be on the I-35 corridor, from Texas to Minnesota, as this area provides important spring and summer habitat for the monarch butterfly. The Corps has over 1 million acres at 45 projects within 50 miles of I-35. Coordination with partners, such as Texas Parks and Wildlife and FWS Southwest Region, has begun.
- **Develop metrics to track pollinator habitat improvement:** The Corps has developed specific indicators to track work activities and accomplishments that target pollinator protections for the FY 17 budget development process. At a minimum, the acreage of habitat improvement, invasive species treatment, plantings, site protection, and other related activities will be identified, consolidated, and incorporated into the Corps' annual program recommendations. Additional metrics focusing specifically on monarch improvements and pesticide management will be evaluated for future development.

- **Department of Transportation (USDOT) "Pollinator Flagship Facilities":** The USDOT Office of Sustainability and Safety Management (OSSM) is working closely with USDOT Operating Administrations that own or directly manage properties to identify and implement practices to support and improve the health of wild pollinators and honey bees, and has recommended that evaluation factors based on the addendum to the sustainable landscape guidance, *Supporting the Health of Honey Bees and other Pollinators*, be used in awarding future landscape contract procurements. USDOT has conducted an inventory of landscape management practices documenting widespread use of native plants and minimal insecticide use on USDOT-managed properties. USDOT has identified three properties (Federal Highway Administration's Turner-Fairbank Highway Research Center, the PST/Volpe's National Transportation Systems Center, and the Federal Aviation Administration (FAA) Mike Monroney Aeronautical Center) to serve as "Pollinator Flagship Facilities." Managers of these properties, overseeing a total of approximately 50 acres, have agreed to develop plans for enhanced plantings of pollinator gardens, including native plants, and to reduce mowing to allow increased flowering of existing grassland plants and reduced use of insecticides. In addition, a pollinator garden, certified by the North American Butterfly Association, has been installed at the USDOT headquarters building in Washington, DC in partnership with the building owner.

- **Department of Energy (DOE) pollinator lands at the National Laboratories:** DOE owns thousands of acres of land associated with its national laboratories, field offices, user facilities, and National Nuclear Security Administration (NNSA) operations. For example, the Argonne National Laboratory campus includes 1,500 acres, Brookhaven National Laboratory 5,320 acres, Fermi National Laboratory 6,800 acres, and the Oak Ridge complex 4,421 acres. Consistent with each site's mission, DOE will implement the GSA and CEQ guidance documents concerning the management of Federal buildings and landscapes to include pollinator-friendly regional seed mixes. The first step in the development of performance metrics will be to identify those sites appropriate for the adoption of BMPs and to provide estimates of the area of potential habitat being added. The effort will be undertaken over the next 12 to 18 months. Once the candidate sites have been identified, adoption of BMPs will proceed on a site-by-site basis.
- **Housing and Urban Development (HUD) to issue pollinator notice to grantees:** Most HUD projects are designed and implemented by grantees, and there are currently no landscaping requirements for HUD funding. To advance the President's goals, HUD will develop a notice to encourage grantees to incorporate new pollinator habitats into existing and future projects, and to adjust their landscaping procedures to reduce mowing, plant native species, and review pesticide usage. The notice will document the economic arguments for pollinator support, including reduced landscaping costs and other compliance suggestions, as incentives to implementation. This will be supplemented by educational materials and the incorporation of pollinator awareness into future training materials and vehicles. Grantee projects that incorporate pollinator habitat into project design will be highlighted on the HUD website.
- **Department of State (DOS) to expand pollinator habitat:** The Department of State is committed to conservation and sustainable use of natural resources, representing the United States globally in numerous international environmental fora. The Department of State fosters pollinator-friendly work through the Greening Diplomacy Initiative (GDI), a commitment to lead by example and improve the sustainability of the Department's facilities and operations. The Department is not a large landowner inside the United States, with only seven domestic properties totaling fewer than 71 hectares (175 acres). Domestically, the Department of State will continue its partnership with GSA to explore further pollinator-friendly landscaping enhancements at appropriate facilities. The first of the Department's efforts will include, consistent with the master plan of the facility and subject to the availability of resources, cultivation and planting of a pollinator meadow at the National Foreign Affairs Training Center (NFATC), the main campus of the Foreign Service Institute (FSI), in Arlington, VA, during the spring of 2015. Consistent with the master plan and subject to the availability of resources, a rooftop pollinator garden and general pollinator signage will be installed at NFATC in 2016. There are currently more than 20 U.S. Diplomatic Posts and two domestic facilities featuring pollinator-friendly and/or native plant-focused landscaping, supported by Integrated Pest Management practices at all Department-owned facilities. Four U.S. missions (Bern, Switzerland; Ciudad Juarez, Mexico; Geneva, Switzerland; and Santo Domingo, Dominican Republic) are registered as Certified Wildlife Habitat by the National Wildlife Federation, and the Department will seek, subject to availability of resources, further Mission certifications.

- **Demonstrating special emphasis projects at GSA facilities:** GSA has implemented a variety of sustainable landscaping demonstration projects that support pollinators. These include the Sustainable Sites (SITES)-certified Pete V. Domenici U.S. Courthouse (Albuquerque, NM) landscape renovation, which provides a refuge for urban wildlife with 79% native plants, and the Federal Building at 50 United Nations Plaza (San Francisco, CA), with a green roof designed to create a safe haven and fly-over for bird, butterfly, and insect populations. GSA will review current capital project programs to identify additional special emphasis pollinator-friendly projects to demonstrate best practices and educate the public.

Metrics for Increasing Habitat Quantity and Quality on Federally-Managed Facilities:

White House

- White House Pollinator Garden was planted in 2014 and is being successfully maintained.

Smithsonian Institution (SI)

- Document annual increase of acreage on SI property in the United States covered by best management practices for pollinator health.

US Department of Agriculture (USDA)

- Document number and percent of USDA facilities with People's Gardens.

Department of the Interior (DOI)

- Complete landscaping policy to promote pollinators on all DOI-owned facilities and offices; issue by end of summer 2015.
- All DOI-owned facilities landscaping contracts will include pollinator-beneficial requirements within 5 years.
- Initiate revision of BLM Manual 1740 "Renewable Resource Treatments and Improvements" by second quarter of FY16.
- Update BLM Lands Program stipulations for apiary permits by FY16.
- Develop and issue instructional memoranda directing BLM State Directors to identify a coordinator for pollinator project development, coordination, and reporting in FY15.

Environmental Protection Agency (EPA)

- EPA will complete the baseline pollinator habitat assessment by end 2015, as a prelude to implementing additional pollinator habitat and gardens.

Department of Defense (DOD)

- Review and update appropriate policy issuances by December 2015.
- Signed MOU in February 2015 with Pollinator Partnership to provide technical and programmatic guidance on pollinator habitat implemented on DOD lands.

Metrics for Increasing Habitat Quantity and Quality on Federally-Managed Facilities (Continued):

U.S. Army Corps of Engineers (USACE)

- Issued field guidance and information in June 2014 to field projects on the National Pollinator Strategy, the Corps Pollinator Health Plan, and best management practices.
- Incorporate pollinator management protocols into the draft ER 1130-2-540 by June 2015 for inclusion into final publication. Final publication date to be determined.
- Include specific pollinator guidance and identification of pollinator work in the development of environmental stewardship aspects of the FY17 Budget. Completed.
- Include internal pollinator web-based resources on the Corps Natural Resources Management Gateway to expand education on creating and protecting pollinator habitat.
- Establish FY17 Budget identifiers for pollinator habitat in the ENS Business Line Budget Tool (Environmental-Stewardship Budget Evaluation System (E-S BEST)). Completed.
- Initial identification of partners for pollinator habitat through the Corps Partnership Advisory Committee by May 2015.
- Document, by December 15, 2015, the number of pollinator gardens with displays to promote healthy pollinator habitat for visitor education at Corps facilities.

Department of Transportation (USDOT)

- By December 2015, USDOT will adopt the CEQ guidance into its policies, and flagship facilities will have finalized plans to enhance pollinator-friendly habitat practices.
- Acres of pollinator habitat will be documented at USDOT Flagship Facilities.

Department of Energy (DOE)

- Document annual increases in acreage covered by best practices, with a goal of adopting BMPs at the identified sites over a 10-year timeframe.

Housing and Urban Development (HUD)

- Issue notice to incorporate new pollinator habitats into existing and future projects, and to adjust landscaping procedures to reduce mowing, plant native species, and review pesticide usage, by June 2015.

Department of State (DOS)

- Document and post online the number of Department-owned facilities with pollinator-friendly or native plant-focused landscaping.
- Document the number of Department-owned facilities recognized as Certified Wildlife Habitats by the National Wildlife Federation.

General Services Administration (GSA)

- Identification of additional special emphasis projects involving landscaping to support pollinators will be accomplished by the end of the third quarter of FY15.

E. Native Seed Strategy and Reserve

DOI and USDA are leading Federal efforts to establish a reserve of native seed mixes, including pollinator-friendly plants, for use on post-fire rehabilitation projects and other restoration activities. This action builds on the existing Native Plant Materials Development Program, created by Congress in 2001, that directs the Bureau of Land Management and the U.S. Forest Service to help ensure a stable and economical supply of genetically-appropriate native plant materials. This program is aided by the USDA NRCS Plant Materials Program, which has a nationwide network of Plant Materials Centers (PMC) that evaluate pollinator-friendly plants and develop information for establishing and managing pollinator plants. The PMCs are working with the Xerces Society and native seed industry partners to increase the availability of important pollinator plant material.

Creating a Reserve of Native Seed Mixes

The Presidential Memorandum builds on these activities by identifying existing public and private resources, with the objective of providing regionally-appropriate native seed mix capacity sufficient to meet Federal land restoration and rehabilitation needs, and to potentially contribute to other state and local activities requiring native pollinator seed mixes. To these ends, the Department of the Interior led the multi-agency preparation of a draft *National Seed Strategy for Rehabilitation and Restoration* (2015) and *An Integrated Rangeland Fire Management Strategy* (2015). The National Seed Strategy is directed toward providing land management agencies with the tools needed to facilitate ecological restoration across the United States, including acquisition, storage, and distribution of native seed and other plant materials. The Rangeland Fire Management Strategy includes a Seed Strategy section identifying a systematic pathway forward, including responsible organizations and delivery dates.

Plant Material Development and Production

- **Identification of pollinator-attractive plants:** A team of Federal agency staff, including representatives of the BLM, USFS, ARS, and NRCS, will lead regional native plant and pollinator partnership groups to identify plant species that are both attractive and nutritionally beneficial to pollinators. These include plant species that are currently in production and those species that might need to be increased through established plant materials programs or through collection of seed and grow-out contracts with private industry. The team will also consider if the best way to increase these species is with seed, seedlings, or container stock.
- **Identifying existing pollinator plant production:** Federal agencies will assess work that is ongoing for pollinator-friendly species at plant material centers, nurseries, seed extractories, germplasm storage centers, and other facilities, and outline current and needed capacity to maintain a steady supply of pollinator-attractive native plant species for all agencies to use in restoration, rehabilitation, and other projects requiring pollinator-friendly plant species.
- **Expanding private-sector species availability:** Federal agencies with responsibilities for developing plant materials will assess the collaborative work that is underway with the private seed industry to increase the availability of a variety of pollinator-friendly native species for

use in wildlands and natural areas, as well as the collaborative work needed to maintain a seed supply of pollinator-friendly species for restoration and other uses.

Seed Collection, Storage, and Use

- **Identifying additional plant collection and grow-out needs:** Federal agencies will work with USDA-NRCS Plant Materials Centers, local native plant societies, the seed industry and other partners, agencies, and organizations to create or update Technical Notes that outline pollinator-friendly species by ecoregion. By 2017, all ecoregions in the United States will have pollinator-friendly plant lists. Federal agencies responsible for restoration activities will work with agencies that have plant materials development responsibility to determine which pollinator-friendly native plant species are the highest priority for developing seed transfer and distribution actions. Agencies will identify pollinator-attractive plant species appropriate for permitted wild land collection, areas where seed may be collected, and the amounts of seed that can be sustainably collected in average years on lands they manage, and will begin collecting seed according to species priority.
- **Confirming and augmenting seed storage capacity:** Agencies with plant material storage facilities will assess the current status of agency supplies and storage of pollinator-friendly native plant materials, as well as how these native seeds are distributed to regions and projects. Agencies with responsibilities in the Eastern, Southern, and Midwest regions will work with the private seed industry to determine the storage reserve of pollinator-friendly native plant materials for use in those areas. Agencies with land management responsibility in the West will assess the need for distributed storage, as well as the quality of mobile units for that storage investment.
- **Empowering agency use of pollinator-friendly seedstock:** Agencies will identify funding sources for implementing the seed reserve actions in the Presidential Memorandum and Strategy. Agencies with land-management responsibility will review policies regarding restoration, rehabilitation, and reclamation for opportunities to use pollinator-friendly native plant species. All Federal agencies may utilize the Restoration Services Contract that contains bid items for seed as nursery stock production, outplanting, and other restoration-related activities.

Metrics for Implementing a Federal Native Seed Strategy and Reserve:

Plant Material Development and Production:

- BLM, USFS, NRCS, and ARS will identify plant species that are most beneficial to pollinators to consider in regional development programs by August 2015.
- Agencies that use native plants in restoration activities will determine which pollinator-attractive native plant species are the highest priority for developing seed transfer and distribution zones (September 2015).
- Federal agencies with responsibilities for plant materials development will identify species beneficial to pollinators that are currently being produced by each of the Federal agencies, and will establish the availability of each species by December 2015.
- By October 2015, Federal agencies will identify those pollinator-friendly plant species currently in grow-out programs that are expected to be harvested and made commercially available in the summer/fall of 2016.
- Agencies will also identify by October 2015 those species they expect to begin evaluating and producing, along with estimated targets for when adequate seed of such species will be available to transfer to commercial producers.

Seed Collection, Storage, and Use:

- DOI and the U.S. Forest Service will complete an outline of existing seed collection programs and determine priorities for additional seed collection efforts by October 2015.
- Areas where seed may be collected in sustainable amounts will be identified by December 2015, and collection of seed will be initiated in spring of 2016.
- Seed storage capacity and needs will be identified by April 2016.
- Funding sources for implementing seed reserve actions will be identified by September 2015.
- Agencies with land management responsibilities will complete review of policies regarding restoration, rehabilitation, and reclamation using pollinator-attractive plants by December 2016.
- Agencies with land management responsibilities will evaluate their need to utilize Restoration Services Contracts by December 2015.

Protecting Pollinators From Exposure to Pesticides

Pesticides play a critical role in agricultural production and the health of our society. Pesticides include, among their many and varied uses, the herbicides necessary for no-till agriculture and invasive species plant control, and the insecticides necessary to combat species that can decimate crops or transmit human disease. It is the misuse and overuse of these pesticides that leads to adverse ecological and human health consequences. Federal agencies, particularly EPA, are entrusted with balancing the risks and benefits of pesticide use. This challenge is made more complex for pollinator species, as most pollinators—honey bees, wild bees, moths, beetles, flies—are insects and, as such, are susceptible to the designed toxicities of applied insecticides. Furthermore, plants that are deemed "weeds" and excised from farms and front gardens may have served as nurseries or food sources for honey bees and wild pollinators, including monarch butterflies. These complex considerations mandate care in all pesticide application, and underpin the need for Integrated Vegetation and Integrated Pest Management (IVM, IPM) as sustainable approaches to "managing pests by combining biological, chemical, cultural, mechanical and physical tools in a way that minimizes economic, health, and environmental risks."[10]

Mitigating the effects of pesticides on bees is a priority for the Federal government, as both bee pollination and insect control are essential to the success of agriculture. EPA is working to reduce bees' exposure to pesticides without losing the ability to control pests in agriculture. Certain pesticides are also important pest management tools for beekeepers. Through actions outlined in this Strategy, the Federal government seeks to create physical and temporal space between the use of pesticides and those areas and times when pollinators are present. The Presidential Memorandum specifically tasked EPA to assess the effect of pesticides, including neonicotinoid insecticides, on the health of bees and other pollinators, and to take appropriate actions to protect pollinators. The following summarizes the specific actions that EPA will take over the next 3–5 years to contribute to this effort (see Appendix A for details).

Implement New Harmonized Guidance for Assessing Pesticide Risks to Pollinators

In June 2014, EPA, working in collaboration with Health Canada and the California Department of Pesticide Regulation, released a harmonized guidance for assessing the risks posed by pesticides to bees (USEPA 2014). The guidance describes a tiered process beginning with a conservative screen (Tier 1) that uses laboratory-based acute and chronic toxicity studies of individual adult and larval honey bees. These laboratory results are compared to exposure estimates to ascertain if there are potential risks to the bees. Depending on the results, more refined estimates of exposure can be used to determine if risk estimates exceed levels of concern, at which time higher-tier studies may be required. The higher-tiered studies consist of semi-field tunnel or feeding studies with whole colonies undergoing relatively controlled exposures (Tier 2), to full-field studies of whole colonies with free-foraging bees and pesticide application conditions as close to actual use conditions as possible (Tier 3). Throughout this process,

10. 7 U.S. Code § 136r–1 - Integrated Pest Management

risk assessors consider whether mitigation measures can be applied sufficient to reduce exposures to levels that are not of concern.

- **Issue new toxicity study guidelines to more fully protect honey bees:** EPA is reviewing new exposure and effect study protocols to implement the harmonized pollinator risk assessment process (above). In past years, EPA has routinely required acute contact toxicity testing with individual adult bees (USEPA 2012a), toxicity of residues on foliage with individual adult bees (USEPA 2012b), and field pollinator studies with whole colonies (USEPA 2012c) as part of the suite of data used to characterize the potential exposure and effects of pesticides on non-target organisms. Recognizing heightened concerns for honey bees, in 2011 EPA issued interim study guidance for bee health (USEPA 2011). EPA has developed finalized guidance (USEPA 2014) on the conduct of exposure and effect studies used to characterize the potential risk of pesticides to bees, and on how these data will be required by the EPA. These advances reflect the understanding that the honey bee colony represents a complex superorganism consisting of male and female bees at different stages of development, each with different functions within the colony and with differing routes of exposure to pesticides. Additional exposure study protocols include semi- and full-field studies to examine uptake and decline of residues in plants (particularly in nectar and pollen). Additional effects study protocols include some with existing guidelines developed by the Organisation for Economic Cooperation and Development (OECD), including acute adult oral toxicity (OECD 1998a), acute larval toxicity (OECD 1998b), and semi-field testing with whole colonies (OECD 2007). New guidelines for chronic toxicity testing with adult bees and with bee larvae are under development by EPA, in conjunction with the OECD. OECD guidance documents are also under development for acute toxicity testing with bumble bees, and work is underway internationally to develop additional tests with solitary bees and other insect pollinators.
- **Re-evaluate the neonicotinoid family of pesticides:** Honey bees exhibit complex social behaviors to identify pollen and nectar sources, return to the hive potentially miles away, communicate locational information to the colony, and participate in brood rearing and care. Concern for honey bee health has centered on published reports of chronic neurotoxicity to bees posed by the widespread use of the neonicotinoid family of pesticides. Neonicotinoid pesticides are absorbed by plants and distributed systemically to various plant tissues, with some of the pesticide residue being transferred to pollen and nectar, and then to honey, over potentially prolonged periods. Bees exhibit a wide range of sensitivities to the different neonicotinoid compounds. Under the harmonized risk assessment process, EPA has been working to ensure that there are sufficient data to characterize exposure to, and effects from, these compounds, both at the level of the individual bee and at the whole-colony level. In addition to laboratory-based studies on honey bee adults and larvae, EPA is reviewing multiple field-based studies at the whole-colony level. Consistent with the President's requirements, EPA has further expedited its broad re-evaluation of the nitroguanidine-substituted neonicotinoid subclass (*i.e.*, imidacloprid, clothianidin, dinotefuran, thiamethoxam) under the 2015 - 2017 schedule laid out in Appendix A. As part of EPA's ongoing effort to protect pollinators, the EPA has sent letters to registrants of neonicotinoid pesticides with outdoor uses, informing them that EPA will likely not be in a position to approve most applications for new uses of these chemicals until new bee

data have been submitted and pollinator risk assessments are complete. The letters reiterate that the EPA has required new bee safety studies for its ongoing registration review process for the neonicotinoid pesticides, and that the EPA must complete its new pollinator risk assessments (which are based in part on the new data) before it will likely be able to make regulatory decisions on imidacloprid, clothianidin, thiamethoxam, and dinotefuran that would expand the current uses of these pesticides. This is an interim position, as the outstanding data identified in the re-evaluation program are scheduled to be submitted to EPA over the upcoming few years. Once the data and assessments for honey bees are available, EPA will be able to make stronger and more scientifically-reliable regulatory decisions on their uses.

- **Analysis of neonicotinoid seed treatments:** EPA conducted a draft economic analysis of the benefits of imidacloprid, clothianidin, and thiamethoxam seed treatments for insect control in United States soybean production. The assessment examines the use of neonicotinoid seed treatments in terms of the extent of use and the pests targeted. The assessment also estimates the biological and economic impacts of not allowing the use to continue on soybeans. The draft analysis was released for public comment between October 2014 and January 2015. EPA is reviewing the comments and analyzing additional information relevant to the assessment. EPA typically assesses the benefits of a chemical on a crop by crop basis. EPA's assessment of neonicotinoids' benefits on soybeans is the first completed for the neonicotinoids because some scientific publications claim that treating soybean seeds has little value. EPA will perform additional benefits assessments as part of the registration review process in which EPA will consider both risks and benefits for each of the neonicotinoids.
- **Assess other pesticides for their potential impacts on pollinators:** Many pesticides can affect honey bees and other pollinators, especially when misapplied contrary to label requirements. Building upon the risk framework and study protocol enhancements described above, EPA will incorporate this new science into its regulatory decision-making process for all applications for new active ingredients, as well as periodic reviews of active ingredients under the registration review program, for which EPA will open public comment periods on proposed mitigation decisions. The 2015 release schedule for risk assessments for public comment is detailed in Appendix A.
- **Restrict the use of pesticides that are acutely toxic to bees:** EPA has improved label language and restrictions for pesticides that are acutely toxic to bees. In 2013, EPA notified registrants of four neonicotinoid insecticides and several other insecticides of EPA's decision to reduce potential acute exposure to these pesticides. EPA is considering additional restrictions on a broader range of pesticide products to further reduce the likelihood of acute exposure and mortality to bees from the foliar (leaf) application of acutely toxic compounds. Contracted pollination services pose a particular risk for bee mortality, where a large number of honey bee colonies are intentionally placed at an agricultural site. Application of a toxic pesticide in this scenario is near certain to result in adverse effects to pollinators. Although such outcomes are counterproductive for both beekeeper (loss of honey bee stock) and grower (diminished pollination services), consistent ways to avoid such outcomes have proven challenging. EPA believes that strong regulatory measures should be in place on the contracted service scenario to mitigate

these potential problems. EPA will propose to prohibit the foliar application of acutely toxic products during bloom for sites with bees on-site under contract, unless the application is made in accordance with a government-declared public health response. These measures would include advisory hazard statements (e.g., pollinator protection boxes) as well as enforceable language in the directions for use sections of labels. For colonies not contracted to provide pollination services, EPA believes that state/tribal-managed pollinator protection plans could provide effective means of mitigating potential acute exposures to foliar applied pesticides at bloom, as these plans serve as a means of accommodating both grower and beekeeper needs through cooperative agreements at the local level.

- **Work with states and tribes to issue pollinator protection plans:** Localized and more-customized mitigation measures may best be achieved through states and tribes developing pollinator protection plans. These plans help address the need for improved communication between growers/applicators and beekeepers with respect to pesticide applications. Plans articulate means through which growers, applicators, and beekeepers can quickly and effectively communicate pesticide applications in close proximity to managed colonies. To establish the framework for these plans, EPA is working with state and tribal agencies through existing partnerships. Several states, including California, Colorado, Florida, Mississippi, and North Dakota, have already developed plans. These plans, developed in cooperation with a broad spectrum of agricultural interests including beekeepers, provide the foundation upon which EPA has been collaborating with its state and tribal regulatory partners to identify the necessary elements that the Agency will use to evaluate managed pollinator protection plans developed by states/tribes.
- **Reduce exposures during the planting of pesticide-treated seed:** Modern agricultural practices use precision pneumatic equipment to plant seeds. Bee kills have been reported from the drift of contaminated dust during the planting of pesticide-coated seed using these practices, predominantly from abrasion of the seed coating. Stakeholder engagement on this problem has led to their issuing guidance on seed treatment stewardship (ASTA 2013), along with efforts to develop lubricant agents that can reduce dust generation during the planting of treated seed. EPA has been working with the American Seed Trade Association, equipment manufacturers, and pesticide registrants to explore additional mitigation measures, including broader adoption of best management practices, to further reduce the emissions of these pesticide residues during the planting process. These efforts have included the development of alternative lubricants used in pneumatic planters to reduce the extent of dust generated through the abrasion of treated seed during planting (fugitive dust), as well as the development of more effective seed coatings to enhance the extent to which pesticides adhere to seeds.
- **Evaluate and mitigate pesticide impacts on monarch butterflies:** EPA has determined that the protection of milkweed is consistent with its responsibilities under FIFRA and that it will take actions, as part of its regulatory decisions and voluntary programs, to establish practices and requirements to protect critical milkweed resources. EPA will issue for public comment a draft framework outlining an approach it intends to take to protect monarch butterflies. Specifically, EPA has identified the types of information that may be important to identify actions that bal-

ance monarch protection and weed management. The framework will support and complement the actions and objectives of the Canada/Mexico/United States Trilateral Committee for Wildlife and Ecosystem Conservation and Management. EPA is continuing to work with multiple Federal agencies (*e.g.*, USFS, FWS, USGS) to understand the habitat needs of the monarch butterfly relative to its migratory patterns. The efforts to conserve milkweed species from effects of herbicides may encompass a number of pesticidal compounds. Therefore, in contrast to a typical quantitative single-chemical analysis approach, EPA will rely upon both qualitative and quantitative analyses to weigh risks and benefits and identify actions to conserve the milkweed plant where it is important to monarch butterflies. EPA anticipates that a number of actions could be taken to protect monarch butterflies, ranging from changes to pesticide label instructions, to spray drift buffers from critical milkweed resources, to best management practices. These management practices may mirror and be complementary to other conservation efforts aimed at creating, conserving, or restoring wildlife habitat. Collaboration between partners in different sectors will be important for success to adopt management practices in a coordinated manner, not only at the field level but at the landscape and area-wide levels, as well.

- **Issue guidance for bee incident report inspections:** Bee mortality incidents are reported through tips or complaints to EPA (http://www2.epa.gov/pollinator-protection/report-bee-kills), state, or tribal pesticide programs. EPA considers this incident report data as a means to identify patterns of bee kills associated with the use of specific pesticides or active ingredients, and to thereby inform pesticide regulatory decisions. EPA has developed guidance to identify unique considerations that Federal, state, and tribal inspectors should take into account when they are conducting inspections as a result of the death of honey bees and other social bees (http://www2.epa.gov/sites/production/files/2013-09/documents/bee-inspection-guide.pdf). EPA has required states to report bee kill incidents as part of the Cooperative Grant Guidance through which states receive funding to support incident inspections.
- **Expedite review of new Varroa mite control products:** Many researchers believe that honey bee health has been significantly compromised by hive pests. In particular, the Varroa mite (*Varroa destructor*) is seen as a significant parasite and challenge to maintaining healthy honey bee colonies. In 2014, EPA approved all of the requested emergency exemption applications it received from state agencies for a product that is designed to help manage the mite and to increase the available options for combating resistance development in mite populations. EPA recently registered a Varroa control product, oxalic acid, which is also registered in Canada. EPA is working with the regulated community, other Federal agencies, and the private sector to identify products that may be effective in-hive pest control measures. EPA is committed to expediting the evaluation for any new pesticide products that may be used to help manage colony pests. An increased variety of chemical control measures must, however, be integrated with other non-chemical control methods to ensure that these collective efforts reduce the extent to which Varroa resistance continues to develop.

Environmental Protection Agency Metrics for Protecting Pollinators from Exposure to Pesticides:

- Tiered guidance for assessing the risk posed by pesticides to bees was completed in 2014 (in collaboration with Canada Pest Management Regulatory Agency (PMRA) and California Department of Pesticide Regulation (DPR)).
- Document the number and percentage of registration and registration review chemicals required to submit testing data at each Tier of the above guidance.
- Complete all honey bee exposure and effect protocols and implement the harmonized pollinator risk assessment process by the end of 2016.
- Achieve conformance with the 2015-2017 re-evaluation schedule of the nitroguanidine-substituted neonicotinoid subclass to satisfy the standard for registration under FIFRA.
- Finalize benefits assessments for imidacloprid and thiamethoxam soybean seed treatments by fall 2015.
- Provide annual updates on the number of pesticides for which the new framework for assessing risks to bees has been incorporated. Document the number of labels that contain pollinator-specific mitigation measures.
- Issue for public comment a proposed prohibition on foliar application during contracted pollinator services by December 2015.
- Issue for public comment a draft framework outlining an approach to protect monarch butterflies that balances monarch protection and weed management by summer 2015.
- Document the number of state/tribal pollinator protection plans addressing the need for improved communication between growers/applicators and beekeepers with respect to pesticide applications under development and the number of plans implemented.
- Bee mortality incident guidance was issued May 9, 2013; EPA will report annually on the number of reported mortality incidents, cumulative hive mortality, and results of inspections.
- Document the time required to evaluate proposed new Varroa control products.
- Document the number of Varroacide products available for use.

Conclusions

The Task Force has developed this Strategy to promote the health of honey bees, monarch butterflies, and other pollinators. The overarching goals are to reduce overwintering honey bee colony mortality by 50% within ten years, increase the Eastern wintering population of the monarch butterfly to 225 million butterflies in five years, and restore/enhance 7 million acres of land for pollinators over the next 5 years through Federal actions and public/private partnerships. This Strategy, consisting of a Pollinator Research Action Plan, plans for outreach and education, habitat enhancement and increased acreage, and public-private partnerships, has been described in the preceding sections. The heads of the Executive Departments and Agencies have responded to the elements identified in the Presidential Memorandum on developing such a Strategy. As each component of the Strategy is implemented, the Task Force will modify and adjust the Strategy to reflect the evolving science on which it is founded, to ensure that Federal resources are used effectively to improve pollinator habitat and health. As directed by the President, the representatives from each of the departments and agencies responsible for various elements of the plan will regularly report to the Task Force. Given the importance of a collective response to pollinator declines and the number of sectors of agriculture, industry, and the environment potentially affected by these declines, each of the departments and agencies represented on the Task Force will continue to engage the public and private sectors to develop partnerships that can more effectively leverage the resources needed to effect change at both the national and global level.

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