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Select Committee on the Climate Crisis
United States House of Representatives
H2-359 Ford House Office Building
Washington, D.C. 20515

RE: Request for Information on Addressing the Climate Crisis

Dear Chair Castor, Ranking Member Graves, and Members of the Select Committee,

Please accept the following comments submitted on behalf of the Entomological Society of America (ESA) in response to the Request for Information (RFI) on solutions for addressing the climate crisis. ESA is the largest organization in the world serving the professional and scientific needs of entomologists and individuals in related disciplines. Founded in 1889, ESA has more than 7,000 members affiliated with educational institutions, science agencies, private industry, and government.

Global climate change is one of the greatest challenges facing ecosystems and societies. The accompanying environmental changes are profoundly disruptive to both natural and managed ecosystems, with implications for a broad scope of economic sectors relevant to human health and food security, including agriculture, fisheries, forest management, and urban development. The demonstrable ecological effects of climate change are already necessitating action to respond to current problems as well as to mitigate future impacts.

Given their centrality in most terrestrial habitats on the planet, responses of insect species to climate change will inevitably have broad-reaching environmental consequences. More than three-quarters of all known animal species are insects, and these extremely diverse organisms are critical to healthy ecosystems. Insects are both key indicators and important architects of climate change impacts. From the human perspective, climate change is already negatively affecting insects that provide benefits (e.g., pollinators, natural enemies of pests, nutrient cyclers). Furthermore, climate change is altering the distribution and prevalence of harmful insects (e.g., disease vectors and invasive crop pests), and indirectly increasing the risk of insect outbreaks and disease spread by contributing to the degradation of agricultural, urban, and forested areas.

The societal risks posed by climate change are real and severe. Still, as articulated in this document, ESA firmly believes that the current situation can and should also be viewed as an opportunity to leverage research and innovation to produce informed policy solutions for addressing these challenges. Given the expertise possessed by ESA's membership, the society's response to this RFI will specifically speak to the intersection of climate change and agriculture and infectious disease.



Entomology and Agriculture

7. What policies should Congress adopt to help farmers, ranchers, and natural resource managers adapt to the impacts of climate change?

Advances in the agricultural sciences, including the field of entomology, help to address some of our most pressing societal needs related to food security and safety. Through improved understanding of insect pests and the development of biological approaches to pest management, entomology plays a critical role in the protection of crops from infestation and disease. In addition, entomology contributes to our knowledge of pollinator biology and the factors affecting pollinator health and populations, helping to ensure safe, reliable crop production that meets the needs of a growing world population. As will be expounded upon below, climate change has the potential to augment the challenges posed by insect pests while also jeopardizing pollinator health.

Pollinator Health

Insect distributional ranges are shifting in response to climate change. For species specialized to live in cold or alpine areas, suitable habitats are disappearing, and ranges are contracting. This is especially concerning because many of the species being impacted include native pollinators that play an important role in agricultural production. In fact, it's estimated that pollinators contribute \$29 billion annually in economic value to the U.S. agricultural sector. To ensure a healthy pollinator population, ESA recommends that Congress commit to increasing investment in the research required to examine the diverse factors that endanger pollinator health. ESA was encouraged to see the inclusion of the Pollinator Health Task Force and the establishment of the Honeybee and Pollinator Research Coordinator position in the 2018 Farm Bill. However, in addition to funding increases, ESA supports the U.S. Department of Agriculture's (USDA) coordination of multi-agency activities through the Office of the Chief Scientist to further investigate pollinator health and develop implementation plans to prevent pollinator population decline.

Invasive Insect Species

The climate-related factors contributing to the decline of pollinators are also enabling certain invasive pests to expand their ranges. Recent invaders such as the spotted lanternfly, which consumes a broad range of agriculture and horticulture, and the Asian long-horned tick, which has been linked to livestock deaths, serve as recent examples of this challenge. There is a need for new technologies and approaches for risk assessment, detection, monitoring, eradication (when feasible), and management of established pests. Existing technologies, meanwhile, can be used more effectively. The invention-to-implementation pipeline for invasive species prevention and management needs to be



diversified, strengthened, and ensured. These new tools should not only address capacity issues but also improve sustainability of prevention and management approaches.

ESA applauds the inclusion of language on early detection and rapid response (EDRR) in the Senate's fiscal year (FY) 2020 Interior-Environment Appropriations bill. However, a more sustained approach is needed than what is possible under annual funding bills. To that end, ESA believes that there is an opportunity to leverage existing infrastructure in a way that will foster the broader adoption of EDRR over the long term: Congress should direct the White House Office of Science and Technology Policy (OSTP) to convene the federal funding agencies with a focus in this space (USDA, Department of Interior, U.S. Forest Service, the Centers for Disease Control and Prevention (CDC), and the National Science Foundation (NSF) among others), along with the research community, and other relevant industry stakeholders to develop a framework for creating a coordination network to improve surveillance of invasive threats from air, land, and sea.

Innovative Approaches to Pest Control

Adaptation strategies are required for agricultural ecosystems to continue functioning despite climate change. This includes the utilization of novel, nontraditional methods of pest control. One such approach is Integrated pest management (IPM), which uses science-based, environmentally conscious, comprehensive methods to take effective management action against pests, often resulting in lower costs and a more targeted use of pesticides. Recent research suggests this strategy can save farmers money through using a lower volume of pesticides while also increasing crop yields in produce that depend on pollinators.

IPM-related tools also include biological control, which involves the introduction of insects and plants that can counter or deter pests. This is a strategy that is also sometimes utilized to respond to invasive species when such a means can be identified.

Research trials have already demonstrated that the integration of native prairie vegetation into crop fields has improved biodiversity by causing native pollinator populations to flourish while also supporting birds and other insects that put a check on the spread of invasive species. An added benefit of IPM practices such as those described above is its ability to help slow climate change by enabling the soil to capture and store carbon dioxide.¹ These techniques can be augmented through the use of smart technologies. By analyzing data collected by sensors strategically placed on cropland, researchers in the academic and commercial sectors can develop recommendations for the targeted application of various IPM methods as well as soil treatments.

¹ It is worth noting that this aspect of IPM is directly relevant to question #6 in the RFI: *What policies should Congress adopt to reduce carbon pollution and other greenhouse gas emissions and maximize carbon storage in agriculture?*



Despite its benefits, IPM is not widely used in commercial-scale farming. ESA recommends that Congress expand support for applications of Area-wide Integrated Pest Management Act and incentivize the broader adoption of IPM by promoting area-wide IPM (AIPM) research at USDA and expanding our nation's ability to predict, mitigate, and respond to threats from agricultural pests that are already benefiting from a warming climate. ESA would also encourage legislation establishing a federal AIPM Committee to oversee program priorities and include the USDA Agricultural Research Service's (ARS) National Program Leader for the Invasive Pests of Crops, the USDA National Institute of Food and Agriculture's (NIFA) National Program Leader for Bio-based Pest Management, and USDA's Senior Invasive Species Coordinator.

Vector-borne Disease

One area not included among the RFI questions but that still demands attention because of its connection to climate change is vector-borne disease (VBD). With an increasingly globalized world and a warming climate, the ranges of insects and ticks that transmit disease are expanding. For example, the incidence of Lyme disease has increased over 130-fold from 1981 to 2016. This may result in increased infectious diseases without appropriate monitoring and intervention. To position the United States as a leader in providing innovative solutions and technological products to address these diseases worldwide as well as to ensure the nation is properly prepared for natural and human-made threats, a comprehensive federal strategy for multi-agency investment in emerging infectious diseases—especially VBD—is required.

Enacting legislation such as the *Ticks: Identify, Control, and Knockout Act of 2019* (H.R. 3073) would constitute a positive step forward. Specifically, the bill would establish an Office of Oversight and Coordination for Vector-Borne Disease within the Department of Health and Human Services to promote interagency coordination; develop a maintain a national plan for responding to VBD; reauthorize the CDC Regional Centers of Excellence in Vector-Borne Disease for five years; and authorize a cooperative agreement through CDC to support state health department efforts to improve surveillance, diagnosis, and education.

Sincerely,

A handwritten signature in black ink, appearing to read "R. K. Peterson", written in a cursive style.

Robert K. D. Peterson, Ph.D.
2019 President, Entomological Society of America
Professor of Entomology, Montana State University