WASHINGTON REPORT
September 25, 2023
Lee Van Wychen

Annu Kumari: 2023 – 2024 Weed Science Policy Fellow

Annu is a third-year Ph.D. student at Auburn University, pursuing her doctorate degree with Dr. Andrew Price and co-advised by Dr. Steve Li. Annu's dissertation project is focused on integrating herbicides and cover crops in southeastern production systems to control troublesome weeds. While trained as a weed scientist, Annu is developing skills in cross-functional disciplines as she has a minor in Statistics and Plant Pathology. She received a B.S. in Agriculture, majoring in Agronomy, from CCS Haryana Agricultural University, India. Annu grew up on a small family farm in southern Haryana and engaged in integrated farming practices. She had keenly observed the struggle of small producers to grow a successful crop. Also, while being on a farm, she learned the importance of integrated pest management practices to deliver economically viable yield parameters in a sustainable manner. Her enthusiasm for pest management directed her to pursue her education in the agricultural field with a major in weed science. Annu aims to improve her research and communication abilities to make a meaningful impact in weed science, ultimately working towards sustainable agriculture to tackle the food demands of the growing population. The Science Policy Fellowship gave her a great opportunity to gain substantial leadership experience in public policy and advocacy on a wide array of weed science policy issues. Recently, Annu had a great opportunity to interact with U.S. representatives from Alabama to discuss the importance of research funding, funding for the U.S. Department of Agriculture, the Endangered Species Act, and other science policy topics. Annu is grateful to the WSSA and Science Policy Committee for providing her with this great learning opportunity.

Cynthia Sias: 2023 – 2024 Weed Science Policy Fellow

Cynthia is a third year Ph.D. student at Virgina Tech studying under the direction of Dr. Michael Flessner. Her dissertation research is focused primarily on using cover crops for weed management in soybeans and corn production systems. Prior to her Ph.D. work, she received a B.S. in Agriculture from Cornell University and an M.S. in Agronomy from Texas A&M University. Cynthia is passionate about educating the public about agriculture, and helping farmers overcome challenges year to year. She is grateful for the opportunity to learn how decisions are made in our government, and to understand how that directly impacts farmers. Cynthia is eager to apply what she has learned during this time with the Science Policy Fellowship in hopes of creating more opportunities for farmers to be heard and be a part of the decisions being made.

WSSA Comments on EPA's Vulnerable Species Pilot Project

The EPA has identified 27 pilot species that are classified as either endangered or threatened based on documentation from the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS). EPA did not consult with FWS or NMFS to develop the list, but considers these species have a medium or high overall vulnerability to pesticides. Many thanks to Bill Chism, WSSA Endangered Species committee chair, for his extensive work on WSSA's comments for the vulnerable species pilot project.

EPA's initial set of priority species includes:

- Group of plant species in Lake Wales Ridge area of Florida (including Avon park harebells (*Crotalaria avonensis*), Garrett's mint (*Dicerandra christmanii*), wireweed (*Polygonella basiramea*), scrub blazingstar (*Liatris ohlingerae*), short-leaved rosemary (*Conradina brevifolia*), scrub mint (*Dicerandra frutescens*), Florida ziziphus (*Ziziphus celata*), and several other species that occur in this area)
- Leedy's roseroot (*Rhodiola integrifolia ssp. leedyi*)
- **Mead's milkweed (*Asclepias meadii*)**
- Okeechobee gourd (*Cucurbita okeechobeensis ssp. okeechobeensis*)
- Palmate-bracted bird's beak (*Cordylanthus palmatus*)
- White bluffs bladderpod (*Physaria douglasii ssp. tuplashensis*)
- Madison cave isopod (*Antrolana lira*)
- Ouachita rock pocketbook (*Arkansia wheeleri*)
- Rayed bean (*Villosa fabalis; freshwater mussel*)
- Scaleshell mussel (*Leptodea leptodon*)
- Winged mapleleaf (*Quadrula fragosa*)
- Riverside fairy shrimp (*Streptocephalus woottoni*) and San diego fairy shrimp (*Branchinecta sandiegonensis*)
- **American burying beetle (*Nicrophorus americanus*)**
- Poweshiek skipperling (*Oarisma poweshiek*)
- Rusty patched bumble bee (*Bombus affinis*)
- **Taylor's checkerspot (*Euphydryas editha taylori*)**
- Ozark cavefish (*Amblyopsis rosae*)
- Attwater's prairie chicken (*Tympanuchus cupido attwateri*)
- Buena vista lake ornate shrew (*Sorex ornatus relictus*)
- Wyoming toad (*Bufo hemiophrys baxteri*)

In 2022, Enlist was banned in 11 Arkansas counties because of the American Burying Beetle. A similar "prevention" tactic will be tested next year in Washington and Oregon, but **with a major difference.** In Arkansas, **no critical habitat** had been designated, but it will be in Oregon and Washington for **Taylor's Checkerspot butterfly**. EPA has determined that the appropriate mitigation measure for Taylor's Checkerspot butterfly is to **prohibit all broadcast and aerial spraying of pesticides** in the areas where the butterfly is found. These will be referred to as "Pesticide Use Limitation Areas" or **PULA's**. This will essentially create large areas of Oregon and Washington where pesticides cannot be sprayed. The plan is slated to go into effect next

year. Without any changes, it will have a massive impact on pest management in places like Oregon's Willamette Valley.

As part of WSSA's comments on the proposed vulnerable species pilot project, I also asked each of my Science Policy Fellows to research one of the 27 pilot species. Below are their reports.

American Burying Beetle – By Annu Kumari, Weed Science Policy Fellow

Many hypotheses about the decline of the American Burying Beetle, *Nicrophorus americanus,* include deforestation, agricultural intensification, pesticides, loss of prairies, artificial lighting, increased competition from vertebrate scavengers, and population declines of carrion species (Sikes and Raithel, 2002). Most assumptions were related to the reduced availability of appropriately sized carcasses required for *N. americanus* reproduction. In addition, the decline in American burying beetle populations can be attributed to various other potential factors, for example, the presence of diseases, pathogens, and parasites, the disappearance of critical mammalian predators (allowing other scavengers to flourish), and the extinction of the passenger pigeon, which served as an optimal carrion source. Moreover, other contributing factors are light pollution, pesticide usage, runoff, erosion, and spray drift.

Pesticides Management Comments:

Previous research concerning the role of pesticides in the decline of *N. americanus* primarily focused on DDT. However, it is considered an unlikely cause since its usage did not align geographically with the declines observed in *N. americanus* populations (Sikes and Raithel 2002 and Kozol et al. 1988). Additionally, the increased use of DDT (and other pesticides) is not a likely explanation because of inconsistent disappearances of American Burying Beetle in areas without pesticide spraying and the lack of disappearance of other *Nicrophorus spp*. in heavily sprayed areas (Sikes and Raithel 2002).

It seems unlikely to attribute the fall in the population of the American burying beetle to pesticides. Moreover, DDT or other organochlorine pesticides could not have been the cause of the majority of extirpations because most of them occurred more than 25 years before these chemicals were widely used on our landscape, according to the timing and pattern of the decline, especially in the North-east region (US Fish and Wildlife Service 1991). Additional and further research is needed to examine the effects of particular pesticides on the survival and reproductive abilities of *N. americanus*.

Instead of implementing a direct ban on pesticide use, it is necessary to conduct further research to identify the specific group of herbicides and insecticides that cause the most significant risk to *N. americanus*. This approach is important as it allows for the management of troublesome and resistant weed species, such as pigweeds, while also considering the protection of the beetle.

In the northern region, *N. americanus* was found in wetter areas while avoiding agricultural and urban areas. On the other hand, in the southern range, *N. americanus* was associated with sandy soils, hayfields, grasslands, and native forests but actively avoiding human population

centers and agricultural areas (Leasure and Hoback, 2017). However, the EPA story map of American burying beetles includes numerous metropolitan cities. Hence, it is advisable to implement geographically specific measures and recommendations of pesticides to effectively manage the American burying beetle.
It is necessary to avoid spraying pesticides within all or part of the range and/or critical habitat of a species and avoid spraying during its peak activity period. A major factor is to consider in the avoidance area and minimization area if the application is within proximity of the species' habitat.

Measures to reduce pesticide exposure to the species' habitats include implementing equipment and practices that minimize spray drift, such as utilizing nozzles that produce larger droplets or reducing the amount of small droplets and using swath offsets. Moreover, creating no-spray buffers and improving warning label language to prevent drift onto species ranges are part of the pilot plan. A reduction in application rate by less than 25% is suggested to help mitigate pesticide exposure.

Runoff more easily occurs when soils are saturated or when large precipitation events occur. In case of high rainfall actions or wet soils it can lead to offsite transport of on-field pesticides. For this reason, avoiding pesticide applications when runoff is expected will reduce the likelihood of offsite pesticide transport. Furthermore, it is crucial to avoid pesticide application when there is a 50% chance of rain to prevent runoff and potential harm to the beetles and their habitat.

Other measures:

- Maintain proper habitat in mature forests, upland shrubland, and prairies. Reproduction can be enhanced by providing suitable carrion during the peak breeding period and protecting it from other scavengers.
- Some researchers also suggest that the now-extinct passenger pigeon, which once appeared in staggering numbers, might have been a significant food source for this species of burying beetle. Source: https://mdc.mo.gov/discover-nature/field-guide/american-burying-beetle
- Captive Breeding and Reintroduction: Create and maintain captive breeding populations as a safeguard against the risk of extinction. Reintroduction programs should be implemented to release beetles into suitable habitats where they have disappeared or declined.
- The carrion population, the primary food source for American burying beetles, decreased due to changes in the congenial flora and fauna brought on by urbanization-favoring activities like deforestation. Therefore, we can conclude that reintroducing species based on genetic research and restoring a favorable environment may help to solve this issue.

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Mead's Milkweed: By Cynthia Sias, Weed Science Policy Fellow

The decline of Mead's milkweed, *Asclepias meadii,* populations in grasslands and prairies in the Midwest has led to its categorization as a federally threatened species by the U.S. Fish and Wildlife Service (FWS) under the Endangered Species Act. Reasons behind the decline in its populations are often attributed to factors such as: 1) habitat loss due to residential and commercial development, 2) habitat fragmentation as a result of land development, and 3) agricultural practices such as hay mowing that takes place in June and July which prevents the completion of the plant's life cycle (FWS, 2013).

Although these three main factors attributed to the decline of Mead's milkweed populations are not incorrect, the biological and reproductive cycles of the plant are also reason for its slow growth and population expansion. Slow reproductive rates as well as low percentage of seed producing plants contribute to the decline in populations of Mead's milkweed (FWS, 2013). For these reasons, multiple considerations must be applied when developing practical management plans to successfully preserve Mead's milkweed populations.

Pesticide Management Comments

Below are the main strategies submitted by USEPA, Office of Pesticide Programs on June of 2023 to propose mitigation plans for the decline of Mead's milkweed as part of the Vulnerable Species Pilot Project.

Avoidance

- Based on the information available from the Vulnerable Species Pilot Project: Proposed Mitigations, Implementation Plan, and Possible Expansion draft public document, it is stated that as for avoidance strategies for Mead's milkweed preservation, "Pesticide applications are prohibited on grasslands and prairies unless the applicator coordinates with the local FWS Ecological Services field offices to determine appropriate measures to ensure the proposed application is likely to have no more than minor effects on the species…"
- Based on these actions, grasslands and prairies in states such as Kansas, Missouri, Iowa, and Illinois would have to decrease or eliminate use of pesticides for conservation purposes. These actions are not economically considerate for the farmers and ranchers of the area. Instead of proposing cessation of pesticide use, it is important to consider the life cycle of the weed and establish relocation programs to areas of undisturbed land. It is documented that **seedling growth rates can take up to 15 years** to reach flowering stage (FWS, 2013). It is not feasible to expect land to remain unmanaged for 15 years from an economic perspective.

Spray drift and Erosion minimization

- Agricultural research has expanded options to minimize spray drift of volatile compounds (Alheidary, 2020). Between less volatile chemistries, and application technologies, there are options for producers to minimize drift. Previous research indicates that the use of buffers, for example, is an appropriate measure to reduce risk to Mead's milkweed populations by reducing herbicide drift (Schmolke et. al., 2018). Additionally, wind breaks such as tree lines are also options for spray drift minimization (EPA, 2023). These physical buffers would allow for appropriate management of agricultural land by allowing the continuation of pesticide use while still protecting Mead's milkweed in the 34 counties it exists in (FWS, 2013).
- Education and access to these tools is the next step that needs to be implemented to reduce instances of herbicide volatility affecting Mead's milkweed populations. Extension offices are typically one of the main resources for farmers and ranchers when it comes to education. Therefore, federal support for USDA's Cooperative Extension System is of importance for land stewardship.

Other comments:

- Removal of Mead's milkweed via herbicide contact is not always the case. Some herbicides are selective in that their mode of action will not affect broadleaf plants. Additionally, if Mead's milkweed is a grown and well-established plant, drift from an herbicide application may cause symptomology on the plant, but often will not be enough to kill the plant. These reduced levels of herbicide via drift often are an issue in row crop agriculture and can affect yield, but often are not substantial amounts enough to kill a mature established weed.
- Agricultural practices are not ranked amongst the top factors reducing Mead's milkweed populations. Residential and commercial development of land are the two top factors decreasing Mead's milkweed population.
- The main form of reproduction of Mead's milkweed is through rhizomes (FWS, 2013). The 15-year establishment period describes the time for the milkweed to set seed, and up to 30 years to reach reproductive maturity. Seed is often not successful at establishing, and therefore the reproduction period does not always have to be looked at in 30-year increments. Furthermore, perennial species that reproduce through rhizomes can often be perpetuated through tillage as the rhizomes are chopped up and are spread in the process.

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EPA Proposes New Ag Herbicide Rules: Q&A Six-Pack: EPA Draft Herbicide Strategy

By Jason Jenkins, DTN Crops Editor. 9/19/2023. Copyright 2023 DTN, LLC. (reprinted with permission) JEFFERSON CITY, Mo. (DTN) --- Use whatever idiom you want to describe it -- jump through hoops, clear the bar, check the boxes -- the cost of keeping tools in the herbicide toolbox is about to increase for U.S. farmers.

For nearly two years, the Environmental Protection Agency (EPA) has said it will no longer turn a blind eye toward the Endangered Species Act (ESA) and its legal obligation to ensure that pesticides don't jeopardize the continued existence of nearly 1,700 federally threatened or endangered species.

In July, EPA took what it believes is another step toward ESA compliance, releasing the "**Draft Herbicide Strategy Framework**." The 96-page proposal outlines how the agency intends to protect more than 900 listed species and their designated critical habitats (CH) from agricultural uses of conventional herbicides in the lower 48 states. The document is available for public comment until Oct. 22.

The draft herbicide strategy presents substantial change, requiring herbicide users to implement mitigation measures for potential impacts much earlier -- even before EPA or the U.S. Fish and Wildlife Service (USFWS) determines definitely that a herbicide poses a risk.

Here are answers to six questions about EPA's Draft Herbicide Strategy Framework.

1. Why is EPA doing this?

In recent years, EPA has faced many lawsuits by not adequately meeting its ESA obligations. While the agency settled longstanding litigation known as the "megasuit" on Sept. 12, this ongoing legal vulnerability has created uncertainty for farmers and other pesticide users about their continued ability to use many pesticides.

"EPA is not going to dig itself out of this dilemma using a traditional pesticide-by-pesticide, species-by-species approach to complying with the ESA," said Jake Li, deputy assistant administrator for pesticide programs within EPA's Office of Chemical Safety and Pollution Prevention, during a webinar held last month. "Instead, EPA needs to work a lot, lot faster and more efficiently. That means we need to get early mitigations in place to protect endangered species so that even if we haven't fully met our ESA obligations yet, we still have some protections in place in the meantime.

"That's the main reason we created the draft herbicide strategy," he continued. "It's really our first attempt to identify protections for hundreds of endangered species at once and to do so much earlier in the pesticide regulatory process using an approach that's much more efficient

for EPA to implement. By doing all of those things, we think we can provide more certainty to growers about what mitigations they should expect in the future and how we intend to bring herbicides that they use into full compliance with the law."

2. How would it work?
EPA proposes a three-step process.

STEP 1: Conduct an analysis to determine which groups of plant species are expected to have the potential for population-level impacts from direct exposure to herbicides, and which groups of animals could be affected because they rely on listed plants for their diet or habitat. If at least one group of listed species is potentially affected, proceed to STEP 2.

STEP 2: Identify the type and level of mitigation measures needed to reduce herbicide exposure via spray drift and/or runoff or soil erosion. Mitigation measures would be identified specific to a herbicide's active ingredient, formulations, use site, application parameters and maximum use rates.

STEP 3: Determine where mitigation measures would be applied. Spray drift and runoff/erosion mitigation measures could be included on the general product label if the mitigations would apply everywhere the product is used. In some situations, mitigations would target only areas where groups of listed species occur. In those situations, EPA expects to use the Bulletins Live! Two (BLT) website to post geographically specific mitigations for listed species.

3. How many mitigation measures will I need to implement to comply with the product label?
Instead of requiring a certain number of mitigation measures, the EPA herbicide strategy outlines a system where herbicide users need to achieve a minimum number of "efficacy points." EPA assigned one to three points to each option in its menu of mitigation measures. The number of points required will vary based on the herbicide and the field location. As many as nine points may be required of some products if the use occurs within a pesticide use limitation area (PULA).

4. Will there be any exemptions from the runoff/erosion mitigation requirements?
EPA is considering potential exemptions to the mitigation menu requirements. If a field is more than 1,000 feet away from a terrestrial or aquatic habitat for listed species, it may be exempt from mitigation. Fields with subsurface drainage or tile drains may be exempt, but runoff from the entire field would need to be controlled and directed into a retention pond or saturation zone.

Fields may also be exempt if they are managed with a site-specific runoff and/or erosion plan that has been implemented according to the recommendations of a recognized conservation program or appropriate conservation expert. EPA is still developing criteria for experts and conservation programs that would meet this exemption. With the draft herbicide strategy, the

agency specifically requests feedback on the types of experts and programs that could be relied upon to ensure this exemption could be effective.

5. When will the EPA Herbicide Strategy go into effect?
In the "megasuit" legal settlement approved in federal court in California on Sept. 12, EPA committed to issuing a final Herbicide Strategy no later than May 30, 2024. Presently, the draft framework is available for public comment until Oct. 22.

Implementation of the final strategy would occur as existing herbicides come up for registration review, at which time mitigation would be applied. EPA revised its registration review schedule to account for the timing of the final strategy. At present, herbicides including atrazine, dicamba and 2,4-D are all scheduled for Proposed Interim Decisions in 2024. New herbicide active ingredients would incorporate the herbicide strategy from the outset of the registration process.

It should be noted the agency extended the comment period by 30 days after receiving more than two dozen comments requesting 60- to 90-day extensions from various national and state commodity organizations, product registrants and other agriculture-related groups. This includes the American Farm Bureau Federation, the National Association of State Departments of Agriculture, the American Soybean Association, the National Corn Growers Association, the Agricultural Retailers Association, CropLife America, BASF, Bayer and Syngenta.

6. What about other pesticide categories beyond herbicides?
The same Sept. 12 court-approved agreement also outlined deadlines for rodenticides and insecticides.

EPA expects to issue a draft Rodenticide Biological Evaluation, which will assess the effects on all listed species, in November 2023. The final evaluation is expected no later than Nov. 12, 2024. At that time, should it be determined rodenticides do affect listed species or their critical habitats, EPA will initiate consultation with the USFWS and the rodenticide registrants to discuss possible mitigation options.

While a specific date was not given for issuing a draft Insecticide Strategy, EPA agreed to use its best efforts to issue a final Insecticide Strategy by no later than March 31, 2025.

No deadlines were set for the completion of a final Fungicide Strategy, but the determination of such a deadline is expected to take place no later than Aug. 31, 2024.

The EPA Draft Herbicide Strategy Framework and its supporting documents can be found here: https://www.regulations.gov/docket/EPA-HQ-OPP-2023-0365

To submit a public comment, go here:
https://www.regulations.gov/commenton/EPA-HQ-OPP-2023-0365-0001

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FIFRA SAP Meets Again on EPA's Use of 11 Atrazine Microcosm/Mesocosm Studies

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Scientific Advisory Panel (SAP) provides independent scientific advice to the EPA on health and safety issues related to pesticides. There are seven permanent positions on the SAP, which is augmented by additional experts who assist in reviews. The FIFRA SAP conducted on August 22-24, 2023 was titled: "**Examination of Microcosm/Mesocosm Studies for Evaluating the Effects of Atrazine on Aquatic Plant Communities**".

Four of the nine ad hoc members selected for this SAP included the following WSSA and/or APMS members: 1) Aaron Hagar, University of Illinois; 2) Jay Ferrell, University of Florida; 3) John Madsen, retired USDA-ARS, and 4) Kurt Getsinger, US Army Corps of Engineers. They provided excellent review of the 11 atrazine studies in questions.

There is an excellent white paper by EPA that presents EPA's reevaluation of 11 atrazine microcosm and mesocosm studies identified by the 2012 FIFRA SAP as warranting further review. These studies are part of EPA's Ecological Risk Assessment of atrazine and are specifically used in assessing the effects to aquatic plant communities. The use of cosm studies in the ecological assessment of atrazine has a long, 20-year history involving multiple SAPs and EPA reviews.

At issue is EPA's use of a 3.4 ppb concentration-equivalent level of concern (CE-LOC) that EPA issued in an interim atrazine registration decision last year. The CE-LOC for atrazine was previously 15 ppb. After EPA issued the 3.4 ppb CE-LOC last year, many stakeholder groups, including WSSA, asked the EPA to conduct this independent FIFRA SAP because they felt the science was not justified to have a CE-LOC that low. The CE-LOC is the atrazine concentration level that triggers required monitoring and/or mitigation to protect aquatic plant communities.

The atrazine SAP is currently deliberating and writing their final recommendations for EPA. Based on the SAP's discussions, most of the 11 atrazine studies did suffer from various flaws and should not be used to calculate a CE-LOC for atrazine. This would likely lead EPA to establishing a higher CE-LOC, thus leading to less atrazine restrictions for corn, sorghum and sugarcane growers and other atrazine users. More info at: https://www.regulations.gov/search?filter=EPA-HQ-OPP-2023-0154

NIFA Listens FY 2023-FY 2024 Report

The USDA National Institute of Food and Agriculture (NIFA) conducts a biennial stakeholder listening opportunity to collect input to understand key challenges, promising opportunities and recommended top priorities related to advancing agricultural research, education, and extension. You can read more about it on the NIFA Listens webpage.

Over 700 registered participants joined two 2.5-hour virtual Zoom sessions, where 49 preregistered speakers offered oral statements in five-minute slots. Written input from 59 stakeholders was also received via email. A total of 108 stakeholders from 87 distinct organizations, located in 36 US states and Washington, DC, provided input during NIFA Listens FY 2023 - FY 2024.

Dr. Jim Kells, our WSSA-NIFA Fellow, provided oral and written comments on behalf of WSSA based on the weed research priorities survey responses that was recently published in *Weed Science.* Also, Dr. Hilary Sandler, University of Massachusetts and Dr/ Steve Fennimore, University of California – Davis, also provided oral comments supporting weed science research and precision weed management technologies.

The final report captures findings from this year's session. NIFA implemented text analytics workflows leveraging the USDA EDAPT Data Science Workbench. New natural language processing (NLP) algorithms supported sentiment analysis and unbiased identification of top topics clusters and semantic relationships. New Tableau dashboards were designed to support further insight discovery. As reference, this report includes a qualitative analysis RRDC Stakeholder report, including a qualitative analysis comparing priorities identified. Click here to find the full report.

Why Grass Is a Culprit in Some of the World's Worst Wildfires
In Maui, abandoned pineapple and sugar-cane fields filled up with flammable invasive grasses. *By Daniela Hernandez, Wall Street Journal, Aug 22, 2023. 4 min, 7 sec. (best on Chrome)*
https://www.wsj.com/video/series/daniela-hernandez/why-grass-is-a-culprit-in-some-of-the-worlds-worst-wildfires/0AF272ED-97BA-472C-8559-24171F997763

49 Stakeholders Seek Funding for U.S. DOT Invasive Plant Elimination Program The six national and regional weed science societies joined 43 other signatories on a letter to Congress requesting $10 million to start a pilot program for the Invasive Plant Elimination Program authorized by the 2021 Infrastructure Law. The letter is addressed to the chairs and ranking members of the House and Senate Appropriations Subcommittees for Transportation. The Invasive Plant Elimination Program was authorized in the 2021 Infrastructure Law (P.L. 117-58) at $50 million annually from FY 2022 – 2026, but no money has been appropriated to date. If you are aware of organizations or groups that might support this effort, please email me. We will repeat this effort again next year.

Left to right: Lee Van Wychen, Executive Director of Science Policy, WSSA; Taylor Randell Singleton, Assistant Professor, University of Georgia; and John Byrd, President, National Roadside Vegetation Management Association (NRVMA) and Professor, Mississippi State University. They gave presentations at NRVMA's annual meeting in Knoxville, TN on September 12-14, 2023 on a number of topics including EPA's proposed mitigation strategies for complying with the Endangered Species Act and a thorough discussion of the Invasive Plant Elimination Program authorized in the 2021 Infrastructure law.

Annual Cost of Invasive Species Put at Half-A-Trillion Dollars

Invasive species cause more than $423 billion per year in damage to agriculture, fisheries, water supplies, and other ecosystem-dependent benefits worldwide, according to the summary of a comprehensive review by dozens of scientists, released Sep. 4, 2023. The monetary losses, adjusted for inflation, have quadrupled every decade since 1970, the study's baseline, the summary says. The report is the first on the topic from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, which has 143 member nations. The estimated financial loss is "a huge, huge underestimate," Helen Roy of the UK Centre for Ecology & Hydrology, who co-chaired the group that wrote the report, said in a media briefing; many costs such as weeding invasive plants have not been quantified, she said. More than 3500 species are known to have become invasive after people moved them, intentionally or unintentionally, to new locations where they have crowded out native plants and animals,

some of which supported local economies. The number of invasive species is rising faster than ever because increases in global trade and travel help spread them, the summary says. But only 17% of countries have laws or regulations to prevent or manage invasions of these species.

Federal Agency Funding Opportunities

By Steve Young, Jim Kells and Vijay Nandula

Federal departments and agencies with expertise in weed and invasive plant science were brought together at a symposium held during the Weed Science Society of America 63rd Annual Meeting. Individuals from Animal and Plant Health Inspection Service (APHIS), Agricultural Research Service (ARS), National Institute of Food and Agriculture (NIFA), Office of Pest Management Policy (OPMP), Natural Resources Conservation Service (NRCS), US Forest Service (USFS), Bureau of Land Management (BLM), US Geological Survey (USGS), National Park Service (NPS), Department of Defense (DOD), Army Corps of Engineers (ACOE), National Aeronautics and Space Administration (NASA), and National Science Foundation (NSF) shared current research and management efforts and participated in a discussion focused on the identification of funding opportunities and other issues pertaining to research gaps and management needs among this society's membership.

Table 1. Funding opportunities for select federal agencies that focus on weeds and invasive plants.

Agency	Program	Notes
ARS	Areawide Pest Management Program	This is an internally funded program at ARS
APHIS	Plant Protection Act Section 7721	Search website
DOD	Strategic Environmental Research and Development Program	Link to funding
	Environmental Security Technology Certification Program	Link to funding
EPA	EPA Grants	Search for weeds and/or invasive plants
NASA	Applied Sciences Program – Agriculture, Ecological Conservation	Browse practitioner resources, including opportunities that links to NSPIRES (NASA Solicitation and Proposal Integrated Review and Evaluation System)
NIFA	Agriculture and Food Research Initiative (AFRI)	Several programs, including inter-disciplinary, in plant health and production categories
	Crop Protection and Pest Management	Link to RFA
	Methyl Bromide Transition	Link to RFA
	IR-4	Link to RFA
	Organic Agriculture Research and Extension Initiative	Search program information
	Organic Transitions	Search program information

	Specialty Crop Research Initiative	Link to RFA
DOI	Funding Guide for Invasive Species Management	Search program information
NRCS	Conservation Innovation Grants	This program has funded projects on weeds and invasive plants
NSF	Plant Biotic Interactions	A joint program with NIFA that focuses on agricultural species
USFS	Invasive Forest Plants	Requests for applications through the Working with Us link

Each federal department and agency gathered at the symposium support weed and invasive plant science research and/or management through grant funding, technical assistance, and scientific studies. They represent a diversity of stakeholders who may be separated geographically yet have a common focus on weeds and invasive plants in crop, terrestrial, and aquatic ecosystems.

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National and Regional Weed Science Society Meetings

Dec. 11 - 14, 2023 North Central Weed Science Society (NCWSS), Minneapolis, MN www.ncwss.org
Jan. 8 - 11, 2024 Northeastern Weed Science Society (NEWSS), Boston, MA www.newss.org
Jan. 22 - 25, 2024 Southern Weed Science Society (SWSS), San Antonio, TX www.swss.ws
Jan. 22 - 25, 2024 Weed Science Society of America (WSSA), San Antonio, TX www.wssa.net
Feb. 26–Mar. 3, 2024, 25th National Invasive Species Awareness Week, Washington DC www.nisaw.org
Mar 4 - 7, 2024 Western Society of Weed Science (WSWS), Denver, CO www.wsweedscience.org
Jul. 14 - 18, 2024 Aquatic Plant Management Society (APMS), St. Petersburg, FL www.apms.org