September 23, 2024

Office of Pesticide Programs
Environmental Protection Agency Docket Center (EPA/DC), (28221T)
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

RE: EPA's Draft Insecticide Strategy to Reduce Exposure of Federally Listed Endangered and Threatened Species and Designated Critical Habitats from the Use of Conventional Agricultural Insecticides; Docket ID: EPA-HQ-OPP-2024-0299

The National Agricultural Aviation Association (NAAA) appreciates the opportunity to comment on EPA's Draft Insecticide Strategy to Reduce Exposure of Federally Listed Endangered and Threatened Species and Designated Critical Habitats from the Use of Conventional Agricultural Insecticides.

<u>U.S. Aerial Application Industry Background:</u> NAAA represents the interests of the 1,560 aerial application industry owner/operators and 2,028 non-operator agricultural pilots throughout the United States licensed as commercial applicators that use aircraft to enhance the production of food, fiber and bio-energy; protect forestry; protect waterways and ranchland from invasive species; and provide services to agencies and homeowner groups for the control of mosquitoes and other health-threatening pests. NAAA represents fixed and rotary wing aircraft, both crewed and uncrewed.

Within agriculture and other pest control situations, manned aerial application is an important method for applying pesticides, for it permits large areas to be covered rapidly—by far the fastest application method of crop inputs—when it matters most. It takes advantage, more than any other form of application, of the often too-brief periods of acceptable weather for spraying and allows timely treatment of pests while they are in critical developmental stages, often over terrain that is too wet or otherwise inaccessible for terrestrial applications. It also treats above the crop canopy, thereby not disrupting the crop and damaging it. Aerial application has greater productivity, accuracy, speed, and is unobtrusive to the crop compared to ground application[1]. Although the average aerial application company is comprised of but six employees and two aircraft, as an industry these small businesses treat nearly 127 million acres of U.S. cropland each season, which is about 28% of all cropland used for crop production in the U.S. In addition to the cropland acres, aerial applicators annually apply to 5.1 million acres of forest land, 7.9 million acres of pasture and rangeland, and 4.8 million acres for mosquito control and other public health concerns.

[1] Kováčik, L., and A. Novák, 2020. "Comparison of Aerial Application vs. Ground Application." *Transportation Research Procedia* 44 (2020) 264–270.

While there are alternatives to making aerial applications of pesticides, aerial application has several advantages. In addition to the speed and timeliness advantage aerial application has over other forms of application, there is also a yield difference. Driving a ground sprayer through a standing crop results in a significant yield loss. Research from Purdue University[2] found that yield loss from ground sprayer wheel tracks varied from 1.3% to 4.9% depending on boom width. While this study was conducted in soybeans, similar results could be expected in other crops as well. Data from a Texas A&M University economics study[3] and the 2019 NAAA industry survey[4] were used to calculate that the aerial application industry is directly responsible for the production of 1.69 billion bushels of corn, 199 million bushels of wheat, 548 million pounds of cotton, 295 million bushels of soybeans, and 3.33 billion pounds of rice annually that would be lost every year without the aerial application of pesticides. The value in additional crop yield that the aerial application industry brings to farmers, input suppliers, processors, and agricultural transportation and storage industries for corn, wheat, cotton, soybean, and rice production in the U.S. is estimated to be about $37 billion[5].

Research summarized by the University of Minnesota[6] describes how soil compaction from ground rigs can negatively affect crop yields due to nitrogen loss, reduced potassium availability, inhibition of root respiration due to reduced soil aeration, decreased water infiltration and storage, and decreased root growth. Aerial application offers the only means of applying a crop protection product when the ground is wet and when time is crucial during a pest outbreak. A study on the application efficacy of fungicides on corn applied by ground, aerial, and chemigation applications[7] further demonstrates that aerial application exceeds ground and chemigation application methods in terms of yield response. The aerial application of crop protection products results in greater harvest yields of crops. This in turn results in less land being used for agricultural production, preserving more wetlands for natural water filtration, forest ecosystems for carbon sequestration and habitat for threatened and endangered species.

The Texas A&M[4] study revealed that the total area of cropland needed to replace the yield lost if aerial application was not available for corn, wheat, soybean, cotton, and rice production is 27.4 million acres, an area roughly the size of Tennessee. Aerial applicators seed 3.8 million acres of cover crops annually[5]. This means that aerial applicators are responsible for helping to sequester 1.9 million metric tons of CO2 equivalent annually, which according to the EPA would be the equivalent of removing approximately 412,000 cars with carbon-combustion engines from the roads each year.

The aerial application industry is also actively involved in education and research efforts to improve the accuracy and safety of aerial applications. The National Agricultural Aviation

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[2] Hanna, S., S. Conley, J. Santini, and G. Shaner. 2007. "Managing Fungicide Applications in Soybean." Purdue University Extension Soybean Production Systems SPS-103-W. https://www.extension.purdue.edu/extmedia/sps/sps-103-w.pdf

[3] Dharmasena, S. 2020. "How Much is the Aerial Application Industry Worth in the United States?" Research presented at the 2020 Ag Aviation Expo, Savannah, GA. https://www.agaviation.org/2020aatresearchpapers

[4] National Agricultural Aviation Association. May 2019. "2019 NAAA Aerial Application Industry Survey: Operators." https://www.agaviation.org//Files/Comments/NAAA%202019%20Operator%20Survey.pdf

[5] Dharmasena, S. 2021. "Value of the Agricultural Aerial Application Industry in the United States" Research presented at the 2021 Ag Aviation Expo, Savannah, GA. https://www.agaviation.org/2021aatresearchpapers

[6] University of Minnesota. "Soil Compaction." Accessed April 29, 2021. https://extension.umn.edu/soil-management-and-health/soil-compaction

[7] Thomas, D. 2009. Unpublished research results submitted to EPA. https://www.agaviation.org//Files/Comments/Fungicide%20efficacy%20results.pdf

Research and Education Foundation (NAAREF) is a non-profit organization dedicated to promoting research, technology transfer and advanced education among aerial applicators, allied industries, government agencies and academic institutions. NAAREF's Professional Aerial Applicators' Support System (PAASS) program is a four-hour course offered annually at all state and regional agricultural aviation association conventions. The curriculum is brand new every year and a minimum of one hour of PAASS is focused on environmental professionalism. This ensures aerial applicators are kept up to date on the latest information related to making accurate applications and drift mitigation. Nozzle selection, buffer zones, inversions, precision application technology, dissection of real-life drift incidents, and proper spray boom setup are some of the environmental professionalism topics that have been covered in PAASS.

Five years after PAASS became part of the aerial application annual curriculum in 1999, there was a 26% drop in drift incidents according to Association of American Pest Control Officials drift surveys. In addition, ag aircraft accidents have also significantly declined. From 1999 to 2010, the accident rate per 100,000 hours flown dropped by 21.6% compared to pre-PAASS accident rates. From 2011 to 2019, the accident rate dropped even more—30.8%—compared to pre-PAASS accident rates. Each year we continue to see a drop in our accident rate since pre-PAASS days, but now it declines more incrementally. While aviation safety is the domain of the FAA and not the EPA, the reduction in accidents proves PAASS has had, and continues to have, a significant positive impact on the aerial application industry.

Another NAAREF program is Operation S.A.F.E. (Self-regulating Application & Flight Efficiency). The primary component of Operation S.A.F.E. is a fly-in clinic. At a S.A.F.E. fly-in, aerial applicators can have their aircraft calibrated and application patterns (both liquid and dry) measured and evaluated for accuracy and uniformity. Spray droplet size is also measured at a fly-in to ensure the agricultural aircraft is creating the droplet size required by the labels for products to be applied by the aircraft. Many of the concepts used mitigate the risk of drift from agricultural aircraft have originated from ideas first tested at Operation S.A.F.E. fly-ins.

Just last year, NAAA created a professional certification program for the aerial application industry named C-PAASS for Certified Professional Aerial Application Safety Steward. To be certified under C-PAASS aerial applicators must take the PAASS program annually and Operation S.A.F.E. biennially, in addition to belonging as a member to their state/regional agricultural aviation association and the NAAA. C-PAASS professionals are also required to take and be tested on additional aviation safety and environmental stewardship curriculum offered on-line through a learning management system software NAAA installed. The purpose of C-PAASS is to enhance professionalism in the aerial application industry as our statistics show that those that participate in our educational programs are safer from both an aviation and environmental perspective.

<u>Comments</u>

NAAA fully supports the use wind-directional buffers to protect ESA listed invertebrates, obligates and generalists that rely on invertebrates for their survival, and critical habitat from potential drift. NAAA strongly feels all buffers proposed on all labels, whether they be for FIFRA or ESA obligations, be wind directional. Science has consistently indicated that drift only moves downwind[8,9,10]. NAAA has routinely recommended all buffer zones for aerial applications of all pesticides be wind directional in numerous comments submitted to the EPA throughout the years.

Wind-direction-based buffers zones will minimize impact to growers because these areas can still be treated by aerial applicators when the wind is blowing away from protected areas. The buffers will also fully protect listed species and critical habitat from spray drift because they will be implemented when the wind direction is towards the protected site. They provide a win-win solution that balances the needs for optimum agricultural production and protection of endangered species.

Aerial applicators are already experienced with using wind-directional buffers and are equipped with the technology needed to implement them to protect endangered species and other sensitive areas. Agricultural aircraft have smokers, an Aircraft Integrated Meteorological Measurement System (AIMMS), or both. These devices provide immediate and onsite wind direction measurement, so if wind speed or direction does change during the application, they can respond immediately. Both smokers and AIMMS can also provide critical information on air stability and the presence of an inversion. The AIMMS probe can directly measure temperature. As an aerial applicator descends into the target field, they can determine if the temperature increases or decreases as they get closer to the ground. If the temperature cools as they descend, they know there's an inversion present. A smoker offers a visual indicator of an inversion. If the smoke rises as it spreads out, that is a sign of a normal temperature profile with the warmest air at the surface pushing the smoke upward. If the smoke hangs at the same altitude it was released, that's a sign that an inversion is present and vertical mixing of the air is minimal. Uncrewed Aerial Spray Systems (UASS) operators can monitor wind speed and direction within line of site of the drone using a portable weather station, similar to what a ground sprayer operator can use.

NAAA also supports EPA's baseline drift mitigation measures of no applications in wind speeds higher than 15 mph, no applications during an inversion, boom length and swath displacement restrictions, and a maximum release height.

Regarding the spray drift mitigation measures for reducing buffer distance, NAAA supports the current list of mitigation measures as well as the proposed percent reduction in buffer distance for each measure. NAAA does request that the extremely coarse and ultra coarse droplet size distributions be added to the list of mitigation measures, with a corresponding percentage buffer zone distance reduction calculated using EPA's methodology. Using small-orifice straight steam nozzles at higher pressures, even high-speed turbine powered ag aircraft can create an extremely coarse droplet size. Slower speed fixed-wing aircraft, helicopters, and UAAS when equipped with the latest variants of air induction nozzles can create ultra coarse droplet size distributions.

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[8] Kirk, I.W., M.E. Teske, H.W. Thistle. 2002. "What About Upwind Buffer Zones for Aerial Applications?" *Journal of Agricultural Safety and Health* 8(3): 333-336.
[9] Teske, M.E., S.L. Bird, D.M. Esterly, S.L. Ray, S.G. Perry. 2003. "A User's Guide for AgDRIFT ® 2.0.07: A Tiered Approach for the Assessment of Spray Drift of Pesticides." https://usermanual.wiki/Pdf/AgDriftusermanualpubFes2003.1946090729.pdf
[10] Butts, T.R., B.K. Fritz, K.B. Kouame, J.K. Norsworthy, L.T. Barber, W.J. Ross, G.M. Lorenz, B.C. Thrash, N.R. Bateman, J.J. Adamczyk. 2022. "Herbicide spray drift from ground and aerial applications: Implications for potential pollinator foraging sources." Scientific Reports (2022) 12:18017. https://doi.org/10.1038/s41598-022-22916-4

NAAA also asks EPA to consider reducing the boom length beyond the restriction of 75% of wingspan for fixed wing aircraft and 90% of rotor diameter when applying in winds up to 10 mph, and 65% of wingspan for fixed wing aircraft and 75% of rotor diameter for helicopters when applying in winds 11-15 mph as additional mitigation measures. Decreasing boom length and increasing droplet size to reduce the risk of drift from aerial applications was documented in NAAA's June 2023 letter to EPA[11]. Many agricultural aircraft are now equipped with boom shut off valves or pulse width modulation nozzle valves that allow the boom to be reduced to 50% of wingspan or rotor diameter in flight. For pesticides that require a medium droplet size to provide effective control of the targeted pests, allowing a boom to be reduced to 50% of the wing span or rotor diameter would permit aerial applicators to reduce the distance of the wind directional buffer without compromising efficacy, which could occur if they instead increased to a coarse or larger droplet size. NAAA would like to initiate a discussion with EPA to determine what additional data is needed to foster adding further boom length reduction as a buffer zone mitigation measure.

The Insecticide Strategy's inclusion of the numerous types of managed areas that can count towards the total required buffer distance is also supported by NAAA, as is EPA's work towards refining PULAs to more accurately reflect the location of listed species and critical habitat. NAAA is concerned with the tremendous size of the area that will require mitigations for generalist species. While the Vulnerable Species Pilot Project (VSPP) was directed as accurately as possible towards the location of listed species, Figure 9 in the Insecticide Strategy indicates that the vast majority of cropland in the U.S. will fall under some type of required ESA mitigation. It is encouraging, however, the case studies found less mitigations required for generalists than for listed species.

NAAA is also concerned with the potential overall complexity applicators could be faced with by a complex label that contains some mitigations, while directing them to BLT for other mitigations. EPA will need to ensure label language is clear and concise so applicators can quickly determine where they need to look to determine what mitigations are required for their applications. EPA should begin reaching out to agricultural data providers and agricultural operations software manufacturers to explore how BLT PULAs and bulletins can be incorporated into existing workflows. The vast majority of aerial application businesses use ag aviation operations software to coordinate all aspects of their operation. The software tracks, among other parameters, the field location (coordinates for GPS), customer, crop, pests, products, use rates, acres, applicator, application date and time, GPA, EPA registration numbers, REI, required PPE, and weather. It would save applicators a great deal of time if this type of software could access the BLT system, load the PULA's and output the mitigations directly to the work orders.

NAAA does support EPA's current efforts to refine PULAs and reduce their size to include only those areas where listed species and critical habitat are located. NAAA urges EPA to ensure BLT is as streamlined, easy to use, and responsive as possible. In order to reduce the burden on the applicator and allow for quick usage, especially for unexpected work orders coming in with no advance notice and needing immediate applications, being able to check a large number of application sites in a short period of time will be critical. Many aerial applicators work in rural areas with more limited internet speeds, so BLT should also be refined so it can still function in areas with reduced internet capabilities. It is also important the

[11] NAAA letter to EPA, June 29, 2023. https://www.agaviation.org/20230627-letter-to-epa-drift-mitigations/

PULAs are as accurately defined as possible. EPA will need to develop comprehensive education programs to train growers, applicators, pesticide educators, and state pesticide regulatory agencies on how PULAs are accessed, used, and interpreted. While the case studies provided real examples of how mitigations are required, they do not detail how these requirements will appear on labels and the BLT.

NAAA greatly appreciates and supports EPA moving to the Tier 3 model in AgDRIFT with more modern assumptions for modeling the drift from aerial applications as detailed in the Ecological Mitigation Support Document to Support Endangered Species Strategies that accompanied the Insecticide Strategy. We agree the selection of the AT-802 over our originally proposed AT-502B is justified by FAA registration numbers. NAAA also supports EPA using the Tier 3 model with the updated assumptions for all future risk assessments, including ecological, human health, and ESA.

NAAA is disappointed EPA did not include suggestions for surface roughness and boom drop, but appreciates the thorough and detailed analysis they did examining these two variables and NAAA's suggested values. NAAA will begin collecting data to support our assertion that two feet is the standard and most common boom drop for AT-802s, as well as data to document that it is a common drop for many other types of ag aircraft as well. Regarding surface roughness, NAAA will reach out to the USDA-ARS Aerial Application Technology Research Unit and other members of the AGDISP Modernization Project's Technical Oversight Committee to determine if it's possible to find a value that's reflective of having a crop present yet conservative enough to account for varying crop types, heights, and densities to be used in place of the bare ground assumption.

Regarding EPA's statement that "canopy displacement cannot be incorporated into AgDRIFT® Tier III Aerial without further model development", NAAA agrees that AgDRIFT and AGDISP modernization are critical to more accurately model the impact that not only crop canopy has drift deposition, but numerous other variables as well. Many new and emerging aerial application technologies, such as UAAS and spray systems that automatically adjust to weather conditions, will require a modernized model to ensure accurate assessments of drift reduction levels. NAAA is currently working to update the AGDISP model with other user stakeholders. EPA is a consulting party as part of this endeavor.

NAAA interprets section 4.2 Mitigation Tracking to mean that no specific record keeping will be required to track the mitigations employed for reducing buffer distances. However, NAAA is still concerned about who is responsible for ensuring grower compliance with runoff and erosion mitigations. The insecticide strategy frequently refers to a grower/applicator, but many applications, including most aerial applications, are conducted by commercial applicators. Many of runoff and erosion mitigations have nothing to do with the actual application of a pesticide and instead are completely under the control of the grower. It is unrealistic and overly burdensome to make a commercial applicator responsible for ensuring a grower complies with vegetative strip requirements and other similar mitigations completely under the control of the grower. Commercial applicators, either aerial or ground, are frequently not the decision makers nor land managers for the fields to which they apply pesticides. Accordingly, commercial applicators should not be responsible for ensuring grower compliance with the list of options. EPA's own National Pollutant Discharge Elimination System (NPDES) Pesticide General Permit (PGP) clearly demonstrates the difference between an applicator and a decision maker. NAAA agrees with comments submitted to EPA by the Illinois Fertilizer and Chemical

Association (IFCA) about this issue in the Herbicide Strategy.

The 2019 NAAA industry survey shows that 46% of aerial application business have three employees or fewer. Tasking the work of verifying grower compliance with mitigations would be extremely burdensome to such small aerial application businesses. It also sets the applicator up for a penalty or possible tort pursuit for not providing information for practices that are the responsibility of the property owner or decision-maker. If the grower incorrectly selects mitigation options or fails to implement them correctly, will the commercial applicator be held responsible? Will a commercial applicator be held responsible if a grower changes their mind and selects an option from the picklist that is different from the one provided by the grower to an applicator and thus in the application records? For these reasons, commercial applicators should not be held accountable for activities that are entirely outside of their control or expertise, and registration review decisions and labels should reflect this.

Conclusion

NAAA supports the wind-directional buffer zones proposed by EPA in the Insecticide Strategy to protect listed invertebrate species and critical habitat. NAAA also supports the spray drift mitigation measures for reducing buffer distance and the inclusion of numerous types of managed areas as part of any required buffer distance. NAAA does request EPA add extremely coarse and ultra course droplet size distributions as mitigation measures. Finally, NAAA is pleased and fully supports EPA's decision to move to the Tier 3 model in AgDRIFT with more accurate parameter assumptions when modeling the drift from aerial applications.

Thank you for this opportunity to comment.

Sincerely,

Andrew D. Moore
Chief Executive Officer