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Determining Compliance with EPA Endangered Species Strategy for reducing impacts from pesticides

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EPA and the Endangered Species Act (ESA)

Federal Endangered Species Act - 16 U.S.C. §1531 et seq. (enacted in 1973)

As a Federal Agency - EPA must:

Ensure that actions it authorizes, funds, or carries out –

- do not jeopardize the continued existence of any listed species
- result in the destruction or adverse modification of designated critical habitat of such species.

ESA prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife.

EPA must consult with the USFWS and NMFS

Registration of a pesticide is an "agency action"subject to the provisions of ESA
Therefore – registration cannot result in "jeopardy" or "adverse habitat modification" - JAM

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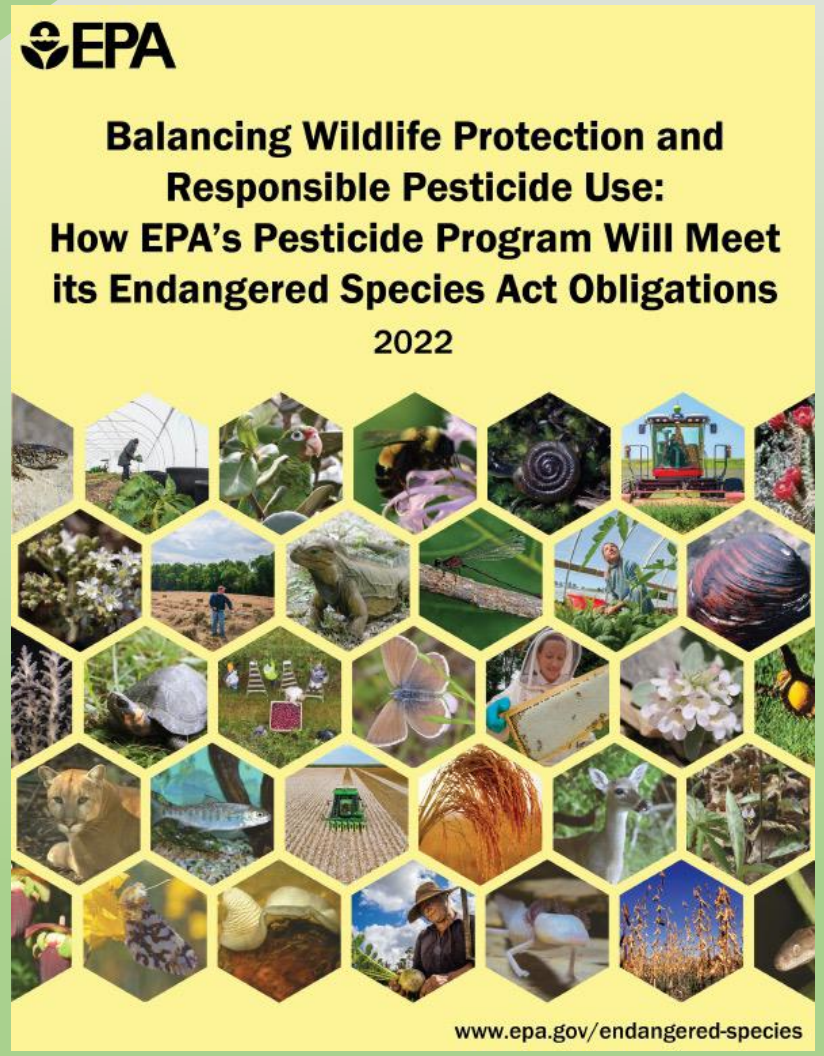

- New strategy adopted in 2022:
  - Meet ESA obligations when registering new conventional pesticides
  - Incorporate mitigation measures before consultations have been completed or even begun
  - Evaluate types of pesticides as a group (e.g. herbicides, insecticides, rodenticides) relative to JAM considerations
  - Apply protections over broader areas and crop types as a preventive measure

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Implementation of EPA ESA Strategy

- Required as part of settlement of ESA Mega-lawsuit
- Most significant change in pesticide use requirements since WPS
- Compliance will require major change in decision making process for design of pest management program

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EPA ESA Strategy - timeline

- EPA is developing strategies by pesticide type
- Herbicide Strategy is finalized (August 2024)
- Insecticide Strategy proposed September 2024 – will be final in 2025
- Vulnerable Species Action Plan – released September 2024
- Pending:
  - Rodenticide
  - Fungicide

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EPA ESA Strategy – How it is being implemented

- EPA will consider possible impacts to endangered species and critical habitat during registration and re-registration process

- Protective measures will be required either on label as directions for use or in geographic specific Bulletins available on Bulletins Live Two (EPA website)

- These requirements will be enforceable for pesticide users

SLAs will be responsible for documenting and ensuring compliance

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Protective Measures –

Two general areas:

Drift mitigation measures- down wind buffers of various sizes based on a number of factors

Interim Ecological Mitigation (IEMs) Measures – Soil erosion and runoff mitigations

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Down wind buffers of various sizes based on a number of factors

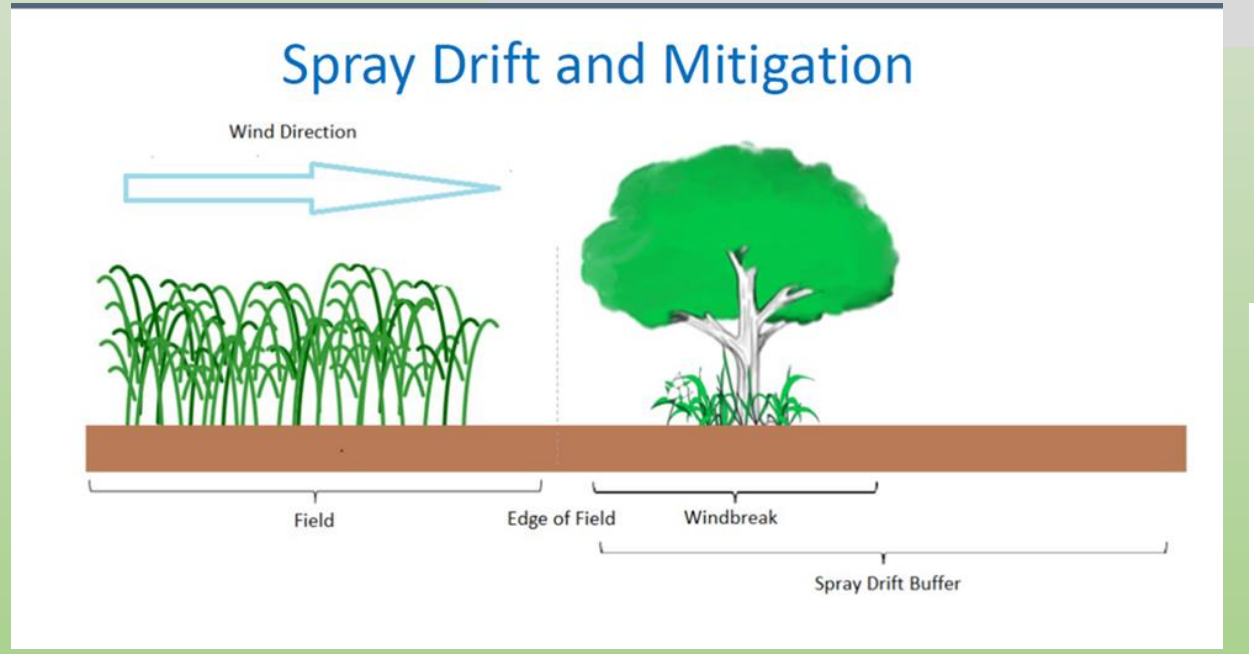

Table 10. Downwind managed areas that can represent ecological spray drift buffers.

When spray drift buffers are identified as mitigations, the following managed areas can be included in the buffer if they are immediately adjacent/contiguous to the treated field in the downwind direction and people are not present in those areas (including inside closed buildings/structures). Any label requirements that prohibit or restricts spray drift in any of these specific managed areas (*e.g.,* to protect human health) must also be followed.

a. Agricultural fields, including untreated portions of the treated field;
b. Roads, paved or gravel surfaces, mowed grassy areas adjacent to field, and areas of bare ground from recent plowing or grading that are contiguous with the treated area;
c. Buildings and their perimeters, silos, or other man-made structures with walls and/or roof;
d. Areas maintained as a mitigation measure for runoff/erosion or drift control, such as vegetative filter strips (VFS), field borders, hedgerows, Conservation Reserve Program lands (CRP)[1], and other mitigation measures identified by EPA on the mitigation menu;
e. Managed wetlands including constructed wetlands on the farm; and
f. On-farm contained irrigation water resources that are not connected to adjacent water bodies, including on-farm irrigation canals and ditches, water conveyances, managed irrigation/runoff retention basins, and tailwater collection ponds.

[1]Growers may need to ensure that pesticide use does not cause degradation of the CRP habitat.

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Interim Ecological Mitigation Measures (IEMs)

Examples of Mitigations to Reduce Runoff and Erosion

Adjacent to the field mitigations

- Vegetative filter strip
- Riparian buffer strip

On-field Mitigation

- Cover crop
- No or reduced tillage, residue tillage management, strip tillage
- Mulching or compost addition
- Contour farming
- Terrace farming/field terracing
- Strip or alley cropping

Controlled Drainage

- Grassed waterways
- Retention pond/Constructed wetland

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Example IEMs:

In order to mitigate exposure from surface water run-off or soil erosion:

- Pesticide use directions will require one or more of the following in order to comply with label directions for use:
    - Vegetative filter strip (minimum width 30 ft for surface water runoff, 20 ft for soil erosion)
    - Field border
    - Field terracing/ contour buffer strips
    - Contour farming
    - Cover cropping
    - No/reduce tillage
    - Grassed waterways
    - Riparian buffer zone/ riparian herbaceous zone
    - Vegetative/grassed ditch banks
    - Runoff retention pond/ water and sediment control basin/ sediment catchment basin/ constructed wetland
    - Strip cropping
    - Vegetative barriers
    - Mulching with natural materials
    - Alley cropping

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Table 7-20. Use-Based Runoff/Erosion Mitigation Identified to Reduce the Potential for Population-Level Impacts for Terrestrial Habitats.[1,2]

Use	Terrestrial Habitats	
	Dicots and Animals Obligately Relying on Dicots (Mitigation Points)	Listed Monocots, Animals Obligately Relying on Monocots, Generalist Animals, and CHs (Mitigation Points)
Asparagus	High (9 pts)	Medium (6 pts)
Barley	Medium (6 pts)	Medium (6 pts)
Barley, oat, small grains, sorghum, wheat (applied to fields that grow these crops, not the crops themselves)	High (9 pts)	Medium (6 pts)
Corn	High (9 pts)	Medium (6 pts)
Cotton	High (9 pts)	Medium (6 pts)
Oats	Medium (6 pts)	Low (3 pts)
Proso Millet	Medium (6 pts)	Low (3 pts)
Sorghum	High (9 pts)	Medium (6 pts)
Soybean	High (9 pts)	Medium (6 pts)
Sugarcane	High (9 pts)	Medium (6 pts)
Triticale	Medium (6 pts)	Low (3 pts)
Wheat	Medium (6 pts)	Medium (6 pts)

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Required Runoff and Erosion measures can be reduced based on county runoff vulnerability

Table 14. Categories of magnitude of difference from nationwide maximum pesticide runoff vulnerability score with corresponding percentiles and classifications.

Order of Magnitude Lower than Max	Pesticide Runoff Vulnerability	
	Percentile	Classification
~2	0 – 9%	Very low
~1	10 – 49%	Low
~Half	50 – 84%	Medium
Maximum	85 – 100%	High

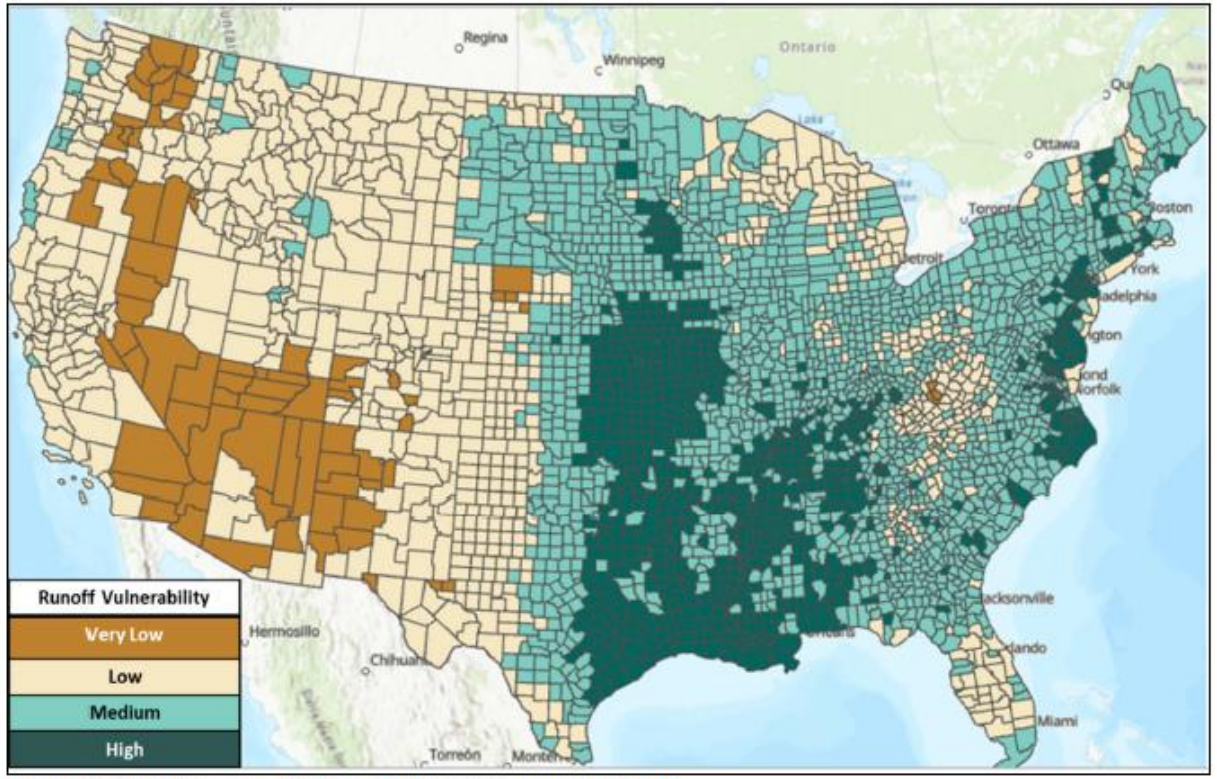

Figure 9. Pesticide runoff vulnerability at the county level.

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Pennsylvania cont.	Points
Clarion County	2
Clearfield County	2
Clinton County	2
Columbia County	2
Crawford County	2
Cumberland County	2
Dauphin County	2
Delaware County	0
Elk County	2
Erie County	2
Fayette County	2
Forest County	2
Franklin County	2
Fulton County	2
Greene County	3
Huntingdon County	2
Indiana County	2
Jefferson County	2
Juniata County	2
Lackawanna County	2
Lancaster County	2
Lawrence County	2
Lebanon County	0
Lehigh County	2
Luzerne County	2

New Mexico	Points
Bernalillo County	6
Catron County	6
Chaves County	3
Cibola County	6
Colfax County	3
Curry County	3
De Baca County	3
Doña Ana County	3
Eddy County	3
Grant County	6
Guadalupe County	3
Harding County	3
Hidalgo County	3
Lea County	3
Lincoln County	3
Los Alamos County	3
Luna County	3
McKinley County	6
Mora County	3
Otero County	3
Quay County	3
Rio Arriba County	3
Roosevelt County	3
San Juan County	6
San Miguel County	3

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Some elements already being implemented

(Base label):

2,4-D CHOLINE SALT	GROUP	4	HERBICIDE
GLYPHOSATE DMA SALT	GROUP	9	HERBICIDE

Enlist Duo®

HERBICIDE
with COLEX-D® Technology

This labeling expires on January 11, 2029.
Do not use or distribute this product after January 11, 2029.

For control of emerged annual and perennial broadleaf weeds, use as a preplant, preemergence and postemergence herbicide on Enlist® corn, soybeans and cotton. Enlist herbicides with Colex-D® technology are the ONLY 2,4-D containing products authorized and specifically labeled for use with Enlist crops.

Use as a non-selective burndown; chemical fallow; use as a preplant and preemergence herbicide on non-Enlist corn, and use as a preplant herbicide on non-Enlist soybeans.

Do not allow contact of herbicide with foliage, green stems, exposed non-woody roots or fruit of crops, desirable plants and trees because severe injury or destruction may result.

Approved for use only in certain geographical areas. Read and follow all label instructions.

Active Ingredient(s):

glyphosate: N-(phosphonomethyl)glycine, dimethylammonium salt	22.1%
2,4-Dichlorophenoxyacetic acid, choline salt	24.4%
Other Ingredients	53.5%
Total	100.0%

2,4-dichlorophenoxyacetic acid equivalent – 16.62% - 1.6 lb/gal
glyphosate acid equivalent – 17.48% - 1.7 lb/gal

ACCEPTED
01/25/2024
Under the Federal Insecticide, Fungicide and Rodenticide Act as amended, for the pesticide registered under EPA Reg. No. 62719-649

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Management of Runoff

A variety of factors including soil type, slope, and weather conditions (e.g., rainfall) can influence volume and intensity of water running off the treated field. The applicator must evaluate all factors and make appropriate adjustments when applying this product. Land management, field condition and application practices that reduce, to the maximum extent practicable, runoff from treated fields, must be implemented by land managers/users of this product.

To reduce the potential for runoff and avoid off field impact from treated fields to maximum extent practicable, applicator must plan/schedule applications to maximize time between an application of this product and anticipated rainfall (or planned irrigation). Application must take place no less than 48 hours prior to irrigation or predicted rainfall (by NOAA/National Weather Service, or other similar forecasting service).

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For land with **Hydrologic Soil Groups* A & B**: The land manager/applicator must effectively implement measures in the following tables to equal a **minimum of 4 credits**.

For land with **Hydrologic Soil Groups* C & D**: The land manager/applicator must effectively implement the measures in the following tables to equal a **minimum of 6 credits**.

Mitigation Measures			Credits
Reduce number of applications - Reduced number of applications of Enlist products per year. Applications may be made at any time during crop development but must maintain a minimum 12-day retreatment interval.		3 applications	0
		2 applications	2
		1 application	4
Residue Tillage Management: no till, strip-till, ridge-till and mulch-till			4
Vegetative Filter Strips	30 ft off-field vegetative buffer on down slope	HSG A or B	2
		HSG C or D	0
	100 ft off-field vegetative buffer on down slope	HSG A or B	4
		HSG C or D	1
Field border: border with dense vegetative stands with a minimum width of 30 ft.			2
Cover Crop			2
Vegetative Barrier: Permanent strips of dense vegetation along the contours of the field with a minimum width of 3 ft.			2
Contour Buffer Strips or Terrace			2
Grassed Waterway			2
Water and Sediment Basin			1
Contour Farming or Contour Strip Cropping			1

*Hydrologic Soil Group (HSG) definitions: A = Sand, loamy sand, or sandy loam; B = Sandy clay loam; C = Silt loam or loam; D = Clay loam, silty clay loam, sandy clay, silty clay or clay.

Applicators/Land Managers must meet minimum criteria described for each mitigation measure as outlined on Enlist.com/mitigationmeasures to receive credits.

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Spray drift buffers – for compliance with ESA mitigation

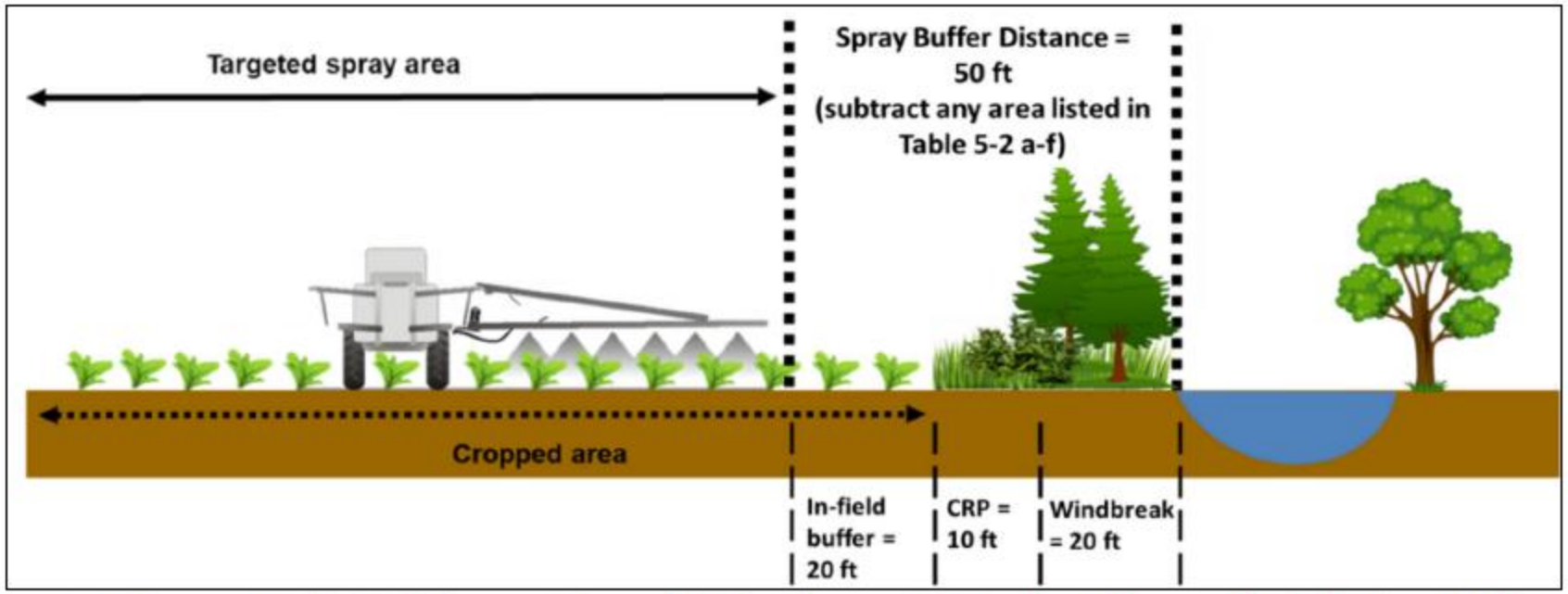

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Table 6-12. Spray Drift Mitigation Measures Identified for Listed Terrestrial and Wetland Dicots and Animals that Obligately Depend on Dicots as Related to Single Maximum Application Rate, Application Method and Droplet Size.[1]

Single Maximum Application Rate (lb ae/A)[2]	Identified Downwind Spray Drift Buffer Distances (ft)						
	Aerial Application			Ground Application			
	Fine-Medium	Medium-Coarse	Coarse-Very Coarse	Very Fine-Fine, High Boom	Very Fine-Fine, Low Boom	Fine-Medium/ Coarse, High Boom	Fine-Medium/ Coarse, Low Boom
2.0	300 + windbreak[3]	300 [a,b,c]	200 [a,b]	200 [e,g,h]	100 [e,g,h]	100 [e,g,h]	100 [e,f,g,h]
1.5	300 + windbreak[3]	300 [a,b,c]	200 [a,b]	200 [e,g,h]	100 [e,g,h]	100 [e,g,h]	100 [e,f,g,h]
0.50	300 [a,b,c]	300 [a,b,c]	200 [a,b]	200 [e,g,h]	100 [e,g,h]	100 [e,g,h]	50 [g,h]
0.07	175 [a,b,d]	125 [b,d]	75 [b,d]	50 [g,h]	20 [i]	10 [i]	10 [i]
Mitigation Measures the Pesticide Applicator can Elect to Reduce Buffer Distances[4]	[a] Buffers ≥175 ft could be reduced by 25 ft if crop height at application is ≥1 ft. [b] Windbreak (release height below top of windbreak) reduces buffer distance by half. [c] Buffers ≥250 ft could be reduced by 25 ft if relative humidity at application is >70% [d] Buffers 75-175 ft could be reduced by 25 ft if windspeed at application is 3-7 miles per hour			[e] Buffers ≥100 ft can be reduced by 25 ft if relative humidity at application is >60% [f] Fine-Medium/Coarse-Low Boom buffers ≥75 ft can be reduced by 25 ft with coarse or coarser droplets [g] Windbreak/Hedgerow (release height below top of windbreak) reduces buffer distance by half [h] Hooded Sprayers reduce buffer distance by half [i] The applicator would achieve sufficient mitigation with a windbreak or hedgerow (release height below the top of the windbreak/hedgerow) or hooded sprayers alone without a buffer.			

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Drift buffers can be reduced if certain mitigation measures are used

Reduction in buffer size can be up to 100%

Table 8. Mitigation measures identified when making broadcast ground applications.

Mitigation Measures	% Reduction in Distance[5]
Application Parameters	
Reduced single application rate	% reduction corresponds to application rate reduction from maximum on pesticide product label[2]
High boom, fine to medium-coarse DSD[1]	55%
High boom, coarse DSD[1]	65%
Low boom, very fine to fine DSD[1]	40%
Low boom, fine to medium-coarse DSD[1]	65%
Low boom, coarse DSD[1]	75%
Over-the-top Hooded Sprayer	50%
Row-middle Hooded Sprayer	75%
Sprays below crop using drop nozzles or layby nozzles	50%
Spray drift reducing adjuvants, Medium DSD	30%
Spray drift reducing adjuvants, Coarse or Very coarse DSD	15%
Reduced Proportion of Field Treated (Number of Ground Application Equipment Passes)[3]	
1 pass	75%
2-4 passes	35%
5-10 passes	15%
Other Mitigation Measures	
Downwind windbreak[4]/hedgerow/riparian/forest/woodlots/shrubland	50% for basic windbreak/hedgerow 75% for advanced windbreak/hedgerow 100% for riparian/forests/woodlots/shrubland ≥ 60 ft width
Relative humidity is 60% or more at time of application	10%

DSD = droplet size distribution

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Pesticide Use Limitation Areas (PULAs):

Established for specific geographic areas
Are established using GIS maps
Can be a listed species range
Can be critical habitat
Can be areas where risk evaluations identify risks to species that may affect listed species
PULAs can be small or extensive

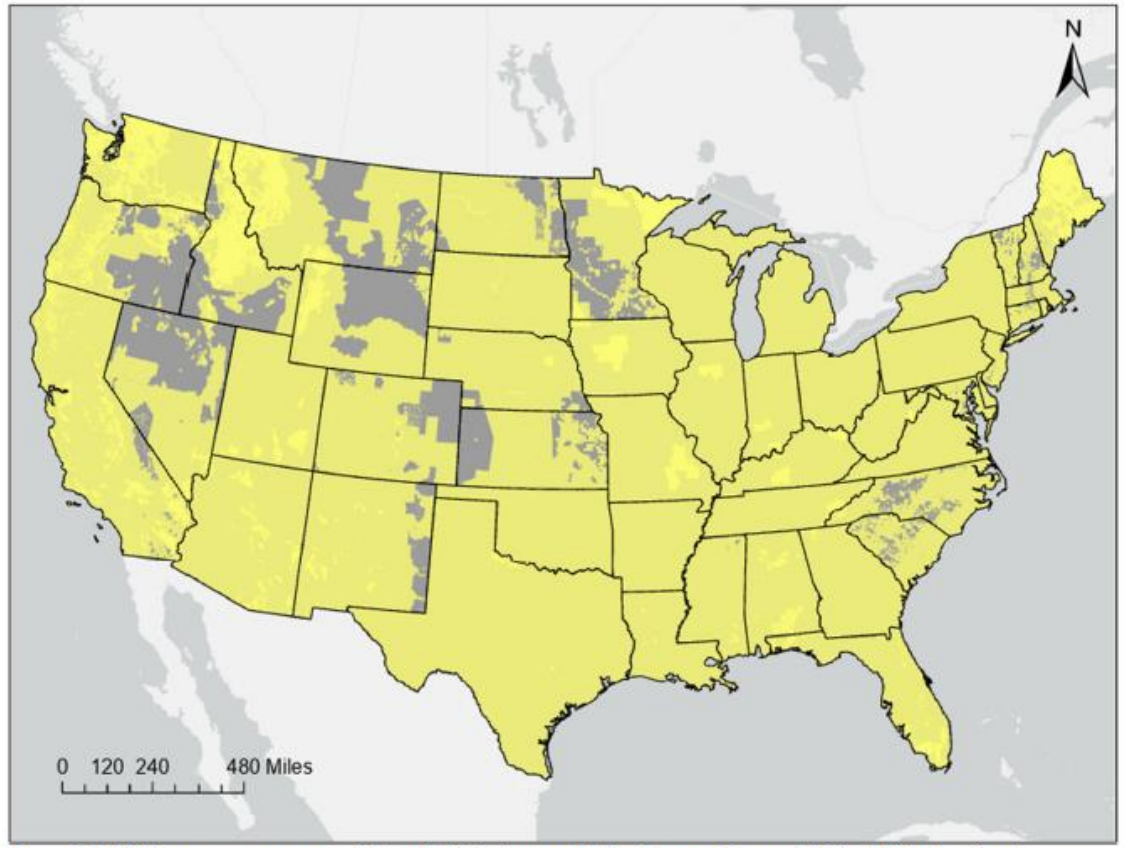

Figure 10. Yellow areas represent the distributions within the contiguous U.S. of listed animal generalists that depend on listed plants for diet or habitat. This map includes the ranges and critical habitats of approximately 550 listed animal species (generalists) under the jurisdiction of FWS.

Note: Some PULAS are being published without notice to SLAs!

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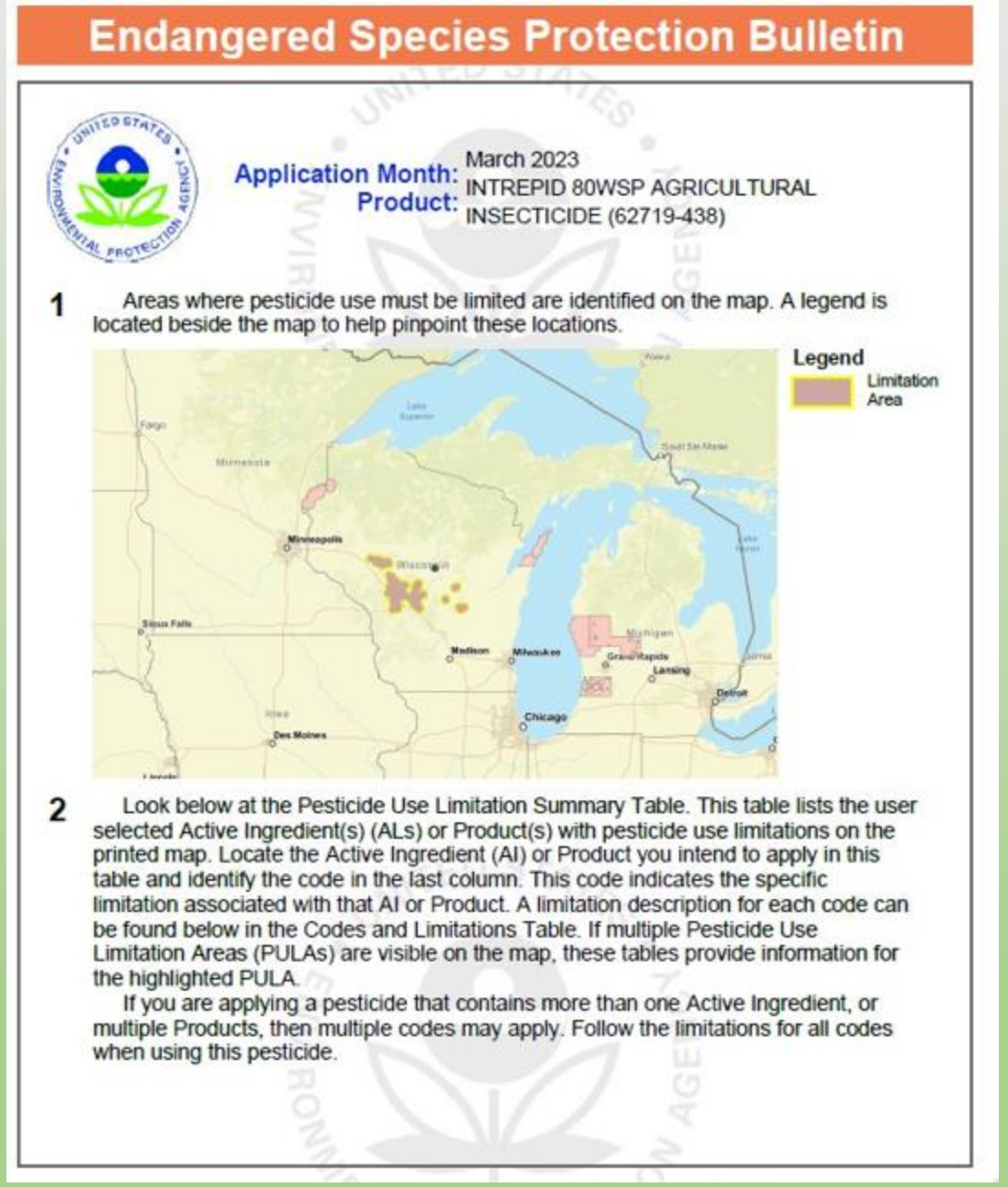
Labels will also reference Bulletins Live Two (BLT)

https://www.epa.gov/endangered-species/bulletins-live-two-view-bulletins

Example Label Language:

When using this product, you must follow the measures, including any timing restrictions, contained in the Endangered Species Protection Bulletin for the area where you are applying the product. Before using this product, you must obtain a Bulletin at any time within six months of the day of application. To obtain Bulletins, consulthttp://www.epa.gov/espp. For general questions or technical help, call 1-844-447-3813, or email ESPP@epa.gov.


Endangered Species Protection Bulletin

Application Month: March 2023
Product: INTREPID 80WSP AGRICULTURAL INSECTICIDE (62719-438)

1 Areas where pesticide use must be limited are identified on the map. A legend is located beside the map to help pinpoint these locations.

2 Look below at the Pesticide Use Limitation Summary Table. This table lists the user selected Active Ingredient(s) (ALs) or Product(s) with pesticide use limitations on the printed map. Locate the Active Ingredient (AI) or Product you intend to apply in this table and identify the code in the last column. This code indicates the specific limitation associated with that AI or Product. A limitation description for each code can be found below in the Codes and Limitations Table. If multiple Pesticide Use Limitation Areas (PULAs) are visible on the map, these tables provide information for the highlighted PULA.

If you are applying a pesticide that contains more than one Active Ingredient, or multiple Products, then multiple codes may apply. Follow the limitations for all codes when using this pesticide.

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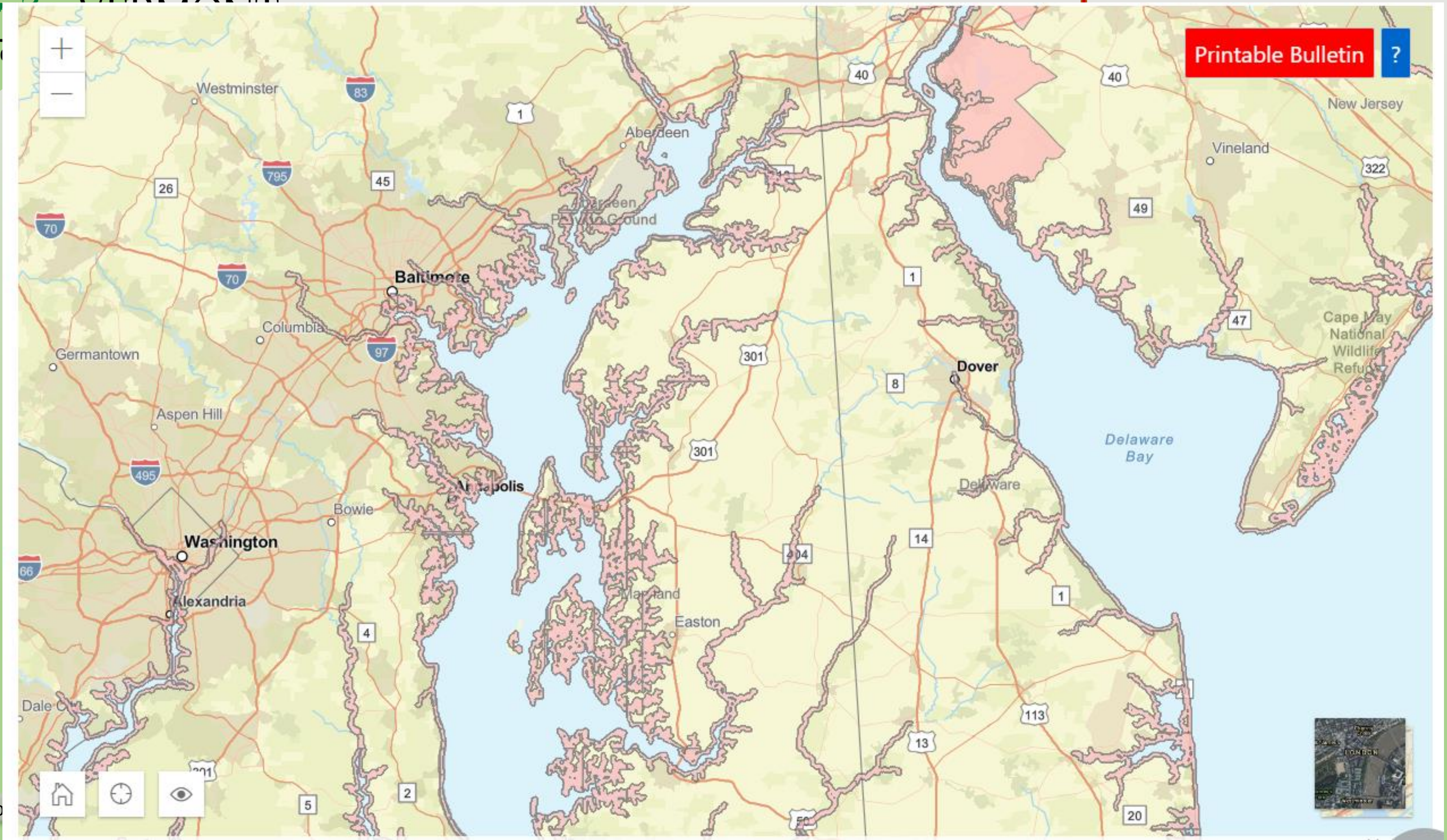
Printable Bulletin
?
Westminster
Aberdeen
New Jersey
Vineland
Baltimore
Columbia
Germantown
Dover
Aspen Hill
Delaware Bay
Bowie
Washington
Alexandria
Easton

**To

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Endangered Species Protection Bulletin

Application Month: March 2025
Product: All products with limitations in selected area

1 Areas where pesticide use must be limited are identified on the map. A legend is located beside the map to help pinpoint these locations.

2 Look below at the Pesticide Use Limitation Summary Table. This table lists the user selected Active Ingredient(s) (ALs) or Product(s) with pesticide use limitations on the printed map. Locate the Active Ingredient (AI) or Product you intend to apply in this table and identify the code in the last column. This code indicates the specific limitation associated with that AI or Product. A limitation description for each code can be found below in the Codes and Limitations Table. If multiple Pesticide Use Limitation Areas (PULAs) are visible on the map, these tables provide information for the highlighted PULA.

If you are applying a pesticide that contains more than one Active Ingredient, or multiple Products, then multiple codes may apply. Follow the limitations for all codes when using this pesticide.

This document contains legal requirements for the use of certain pesticides.
Do not modify any text, graphics or coloration or otherwise alter this document.
ESPP Contact: ESPP@epa.gov Phone: 1-844-447-3813

DREXEL DIAZINON INSECTICIDE (19713-91)	Diazinon	All Agricultural Uses	All application methods, except for treatments <0.1 acre	Emulsifiable Concentrate	STR25
DREXEL DIAZINON INSECTICIDE (19713-91)	Diazinon	All Agricultural Uses	All application methods, except for treatments <0.1 acre	Emulsifiable Concentrate	RPMDZ

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RPMDZ	Do not apply this product when soil is saturated, or when a storm event is likely to produce runoff from the treated area is forecasted (by NOAA/National Weather Service, or other similar forecasting service) to occur within 48 hours following application. Do not apply this product when: wind speeds exceed 10 mph when applying the product via airblast, or wind speeds exceed 15 mph when applying via ground boom or other methods. Do not apply this product when tank mixing with other neurotoxic pesticides (i.e., organophosphate, carbamate, pyrethroid, and neonicotinoid pesticides) at application rates that exceed 50 percent the maximum labeled rate of any pesticide active ingredient used in the tank mixture.

STR25	For this mitigation measure, sturgeon habitat is defined as surface waters accessible to sturgeon, including, but not limited to lakes, reservoirs, rivers, streams, inundated floodplains, wetlands or natural ponds, estuaries and marine near-shore areas. When determining buffer distances, measure from the ordinary high-water mark for rivers, streams, lakes, and tidally-influenced waters. For flooded habitats (inundated floodplains, e.g., Yolo Bypass), measure from the edge of the inundated area. For applications of diazinon, the required number of runoff mitigation points varies based upon the application rate and soil incorporation depth. Each application at a rate >1.5 to 2.5 (lbs a.i./Acre) with a soil incorporation depth 0 to 1 inches requires 70 runoff mitigation points, while a soil incorporation depth >1 to 3 inches requires 40 runoff mitigation points, soil incorporation depth >3 to 7 inches requires 20 runoff mitigation points, and soil incorporation depth >7 inches requires 15 runoff mitigation points. Each application at a rate >0.5 to 1.5 (lbs a.i./Acre) with a soil incorporation depth 0 to 1 inches requires 40 runoff mitigation points, while a soil incorporation depth >1 to 3 inches requires 20 runoff mitigation points, soil incorporation depth >3 to 7 inches requires 15 runoff mitigation points, and soil incorporation depth >7 inches requires 10 runoff mitigation points. Each application at a rate =<0.5 (lbs a.i./Acre) with a soil incorporation depth 0 to 3 inches requires 15 runoff mitigation points, while a soil incorporation depth >3 to 5 inches requires 10 runoff mitigation points, and soil incorporation depth >5 inches requires 5 runoff mitigation points. How to determine the points necessary for selecting the correct mitigation: Step 1. Determine the number of runoff mitigation points needed for your pesticide application. To do this, simply determine the “Mitigation Points Required” based on your application method and rate. Step 2. Click the link https://www.epa.gov/endangered-species/drift-and-runoff-reduction-measures-and-associated-points and choose mitigation options from the table that provide an equal or greater value of points for runoff. Mitigation options can be added together, based on their point values.

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Impact on Pesticide Applicators

Agricultural pesticide users will have to evaluate whether they can make a pesticide application on a field-by-field basis and for each pesticide product by:

- Determining if they have the necessary runoff/erosion control measures or field characteristics
- Whether they are in a geographic area where additional pesticide restrictions are needed
- Requirements established by EPA will change over time as products are re-registered or as ESA consultations are completed

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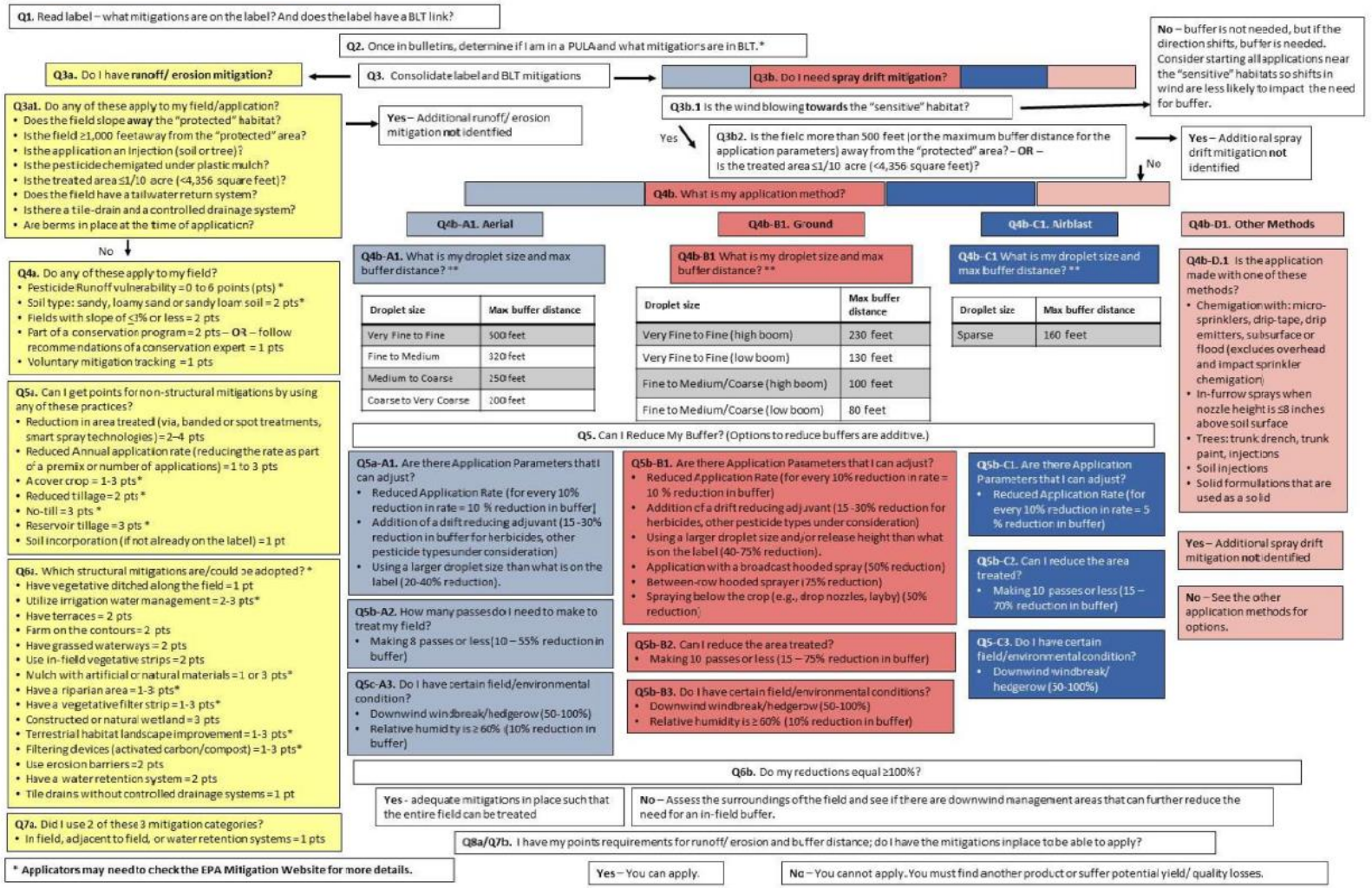
7.3 Appendix C. Flow Chart of Managerial Decisions



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Determining compliance

- Task will be to determine which mitigations are required per label or Bulletin
  - These may be runoff/erosion mitigations or down wind drift buffers

- This may require some pre-work before a site visit in response to a complaint or if part of a compliance project

- This pre-work may require:
  - Identification of land ownership
  - Review of recent aerial maps, if available
  - Obtaining Bulletins from BLT for area involved
  - Review of the NRCS practice codes

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Determining compliance

- Determine applicability of geographic restrictions
  - PULAs – from BLT
  - County Runoff Mitigation Allowances
- Determine applicability of Bulletins from the last six months
- Determine points required for mitigations for most restrictive product used
- Determine which mitigations are applicable
- Obtain statements and records

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Determining compliance

Is the application occurring in a county that is less vulnerable to runoff?

Is the application area comprised of over 50% sand, loamy sand, or sandy loam soil?

Does the application area have a slope ≤ 3%?

Is the application occurring as a partial field treatment (i.e., banded application, spot treatment, or backpack/handheld/precision sprayer application)?
Is the application incorporated via irrigation or as a soil incorporation?

Does the treated field have subsurface or tile drains installed with controlled drainage?

Does the treated field have a perimeter berm system?

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Determining compliance

Predominantly Sandy Soils
Conservation Tillage
Reservoir Tillage
Contour Farming
Vegetative Strips – In-Field
Terrace Farming
Cover Crop/Continuous
Ground Cover
Irrigation Management
Mulching with Natural and Artificial Materials

Erosion Barriers
Grassed Waterway
Vegetative Filter Strips (VFS) – Adjacent to the Field

Vegetated Ditch

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Take aways

- Directions for use that implement the ESA Strategies will appear on agricultural use labels beginning in 2025
- This will include requirements for IEMs and Drift buffers on the label and in applicable Bulletins
- SLAs will need education and training on these requirements
- Existing training avenues (PREP and PIRT- national and regional) will have to incorporate this education
- Pesticide users will need assistance understanding and applying these new requirements.

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Successful Implementation will require:

- Extensive education and information dissemination to growers
- Development of training for CCAs and TSPs
- Development of training for Ag Retailers and development of resources for customers
- Increased funding for CES
- Increased resources for SLAs
- Field-by-field certification mechanism that will provide growers documentation of compliance with requirements

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Thanks

Questions?

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