Sections 3.2.1 and Sections 3.2.2 discuss the spray drift mitigation measures and run-off/erosion mitigation measures that EPA identified in this draft Strategy to address potential population-level impacts to listed species.

For spray drift, as described in the **Ecological Mitigation Support Document,** EPA is not identifying spray drift mitigations for seed treatments. Since exposures seed treatment via runoff/erosion are analogous to other insecticide formulations (*e.g.,* granular, liquid sprays), EPA is also identifying the mitigations discussed in the runoff/erosion section below to address potential runoff/erosion for seed treatments. EPA is not addressing potential exposures via drift from abraded seed (*i.e.,* dust-off) from seed treatments in this strategy because the Agency is taking other actions[26] outside of the strategy including stewardship efforts and recommending fluency agents to address this potential exposure pathway.

In addition, as described in the scope in **Section 2.2**, this strategy also considers listed species that may be exposed via direct contact with an insecticide application on the field. EPA is currently evaluating (with input from the FWS) the potential and extent to which some species of listed terrestrial invertebrates may be exposed on the treated field (*e.g.,* adult butterflies foraging for nectar in a nectar-producing crop). If such exposures are considered to have the potential to cause population-level impacts, then mitigations to address such 'on-field' exposure may be identified. Such mitigations may include restrictions on timing of application relative to the bloom period of the crop, limitations on the time of day in which applications are made, creation of pollinator habitat adjacent to fields, and conditions for airblast applications of insecticides to orchard trees (*e.g.,* dormant vs. full canopy applications).

3.2.1 Spray Drift Mitigation Measures

Spray drift exposures are a potential concern for pesticide applications made via broadcast spray (aerial and ground equipment), airblast, and some chemigation methods (overhead sprayers such as center pivot and traveler sprayers). This section first describes a suite of baseline mitigation measures that EPA generally includes on pesticide product labels to reduce spray drift exposure to non-target species). The remainder of this section discusses the use of a combination of identified buffers and/or other mitigations to reduce the identified low, medium, or high potential for population-level impacts associated with spray drift identified in Step 1. The spray drift mitigations identified to address potential population-level impacts are expressed as a distance from the edge of the application site (*e.g.,* field) where exposures have been identified and there are potential population-level impacts. **Section 3.2.1.2** explains how EPA identified that distance based on the MoDs calculated in Step 1, and **Section 3.2.1.3** discusses mitigation measures for reducing exposures to address the potential for population-level impacts to listed species. **Section 3.2.1.4** also explains how, if a buffer is identified to represent that distance, what types of areas can represent that buffer.

There are insecticide application methods in additon to ground, aerial, airblast, and overhead/traveler sprayer chemigation. EPA's evaluation described in the **Ecological Mitigation Support Document**

[26] https://www.epa.gov/pesticides/epa-issues-advanced-notice-proposed-rulemaking-public-comment-seek-additional

indicates that spray drift exposure from these application methods would be limited and thus the potential for population-level impacts is unlikely. These application methods include:

- Chemigation methods, including: micro-sprinklers, drip-tape, drip emitters, subsurface or flood, and under non-permeable plastic surfaces;
- In-furrow sprays when nozzle height is ≤8 inches above soil surface;
- Tree trunk drench, tree trunk paint, tree injection;
- Soil injection;
- Solid formulations that are used as a solid; and
- Less than 1/10 acre (<4356 square feet) treated and Spot treatment: <1000 sq ft treated (e.g. when applied with backpack or hand held sprayers).

3.2.1.1 Baseline Spray Drift Mitigations

EPA has identified several measures that it generally includes on pesticide product labels to reduce spray drift exposure to non-target species. Because these measures are common mitigations included on pesticide product labels, EPA's evaluation for the potential for population-level impacts incorporates and reflects these mitigations. These mitigations typically include:

- restricting the maximum windspeed to 15 miles per hour,
- prohibiting applications during temperature inversions,
- boom length restrictions and swath displacements for aerial applications,
- maximum release heights for ground and aerial applications, and
- directing sprays into the canopy for airblast and turning off the outer nozzles at the last row.

3.2.1.2 Spray Drift Mitigation Distances

If EPA identifies a potential for population-level impacts (MoD category) associated with spray drift exposure to be low, medium, or high, EPA then identifies the level of mitigation to address the potential for population-level impacts. EPA typically identifies a spray drift buffer to address concerns related to spray drift. For this strategy, for aerial, ground, and airblast sprays, EPA identified buffers to address the potential for population-level impacts. The distance associated with that buffer increases with the level of mitigation (low, medium, and high) and that the buffer be located on the downwind edge of the application site (*e.g.,* field). EPA also identified mitigation measures (described in **Section 3.2.1.3**) that a pesticide applicator could employ to reduce any identified buffer distance because these mitigation measures also reduce exposure within that buffer distance. The **Ecological Mitigation Support Document** describes how EPA determined the efficacy of the mitigation measures, which EPA expresses as a percentage decrease for an identified buffer distance. For chemigation, EPA did not identify a spray drift distance, but rather identified other mitigation measures for overhead and impact sprinkler chemigation equipment when it identifies a potential for population-level impacts to listed species (See **Section 3.2.1.5**).

To address a low potential for population-level impacts for aerial, airblast and ground applications, EPA identifies what it refers to as lower limit buffers. If EPA identifies a medium potential for population-level impacts for aerial, airblast and ground applications, EPA identifies a buffer distance by calculating a chemical specific distance based on the toxicity of the pesticide and estimated deposition. If EPA identifies a high potential for population-level impacts aerial, airblast and ground applications, the

Agency identifies a maximum buffer distance by calculating a maximum buffer that varies depending on the application method. See **Table 8**.

EPA recognizes that for a pesticide application, droplet size can impact the distance which spray drift travels, with larger droplets generally not traveling further than finer droplet sizes. As shown in **Table 8**, to simplify product labels, EPA identified a single spray drift distance based on how pesticides are typically applied for each type of application method. If a smaller droplet size is needed for a particular pesticide, EPA may identify a larger buffer distance. If a pesticide applicator can use a larger droplet size or a low boom, as described in **Section 3.2.1.3**, they would be able to decrease the identified buffer distance. The text below and the **Ecological Mitigation Support Document** provides additional discussion and details about the distances identified to mitigate potential low, medium and high population-level impacts.

Table 8. Potential for Population-Level Impacts Identified in Step 1 and Corresponding Spray Drift Distance to Reduce Impacts.

Potential for Population-Level Impacts from Step 1	Distance from edge of treated area (in feet)		
	Aerial Spray[1]	Ground[2] Spray	Airblast
Not Likely	None	None	None
Low	50	10	25
Medium	Calculated for specific chemical[3]		
High	320	230	160

[1] EPA based aerial distances on the assumption that most aerial applications will use a medium droplet size distribution. If very fine or fine applications are needed for a pesticide, EPA may increase the distance. There are mitigation measures for reducing this distance when using droplets larger than medium.
[2] EPA based these distances on the assumption that ground applications are made using a high boom and very fine to fine droplet size distribution. There are mitigation measures for reducing this distance when using larger droplets and a low boom.
[3] EPA anticipates that chemical specific buffers will be between the lower limit (used for low potential population level impacts) and at or lower than the maximum (used for high impacts) buffer distances.

Where there is a low potential for population-level impacts, EPA identifies a low level of mitigation for aerial, airblast, and ground applications using a lower limit distance. EPA based the identified distances in **Table 8** on the distance where the deposition fraction is estimated to be 10% of the application rate for the different application methods. This equates to 50, 20, and 10 feet, for aerial, airblast, and ground applications, respectively. EPA based these distances on the common droplet size distribution for aerial (medium), the common droplet size distribution for ground (fine) and high boom, and on the sparse orchard setting for airblast.

Where EPA identifies medium potential for population-level impacts, for aerial, airblast, and ground applications the Agency plans to use AgDRIFT to calculate the chemical specific buffer distance when considering a registration or registration review action. This calculation would be the distance to where the deposition exposure is equal to the toxicity threshold (discussed above for Step 1, **Section 3.1.3**). This distance is anticipated to be between the lower limit distance and at or lower than the maximum buffer distance.

Where EPA identifies high potential for population-level impacts, the Agency identifies a maximum spray drift distance at a distance beyond which exposure does not substantially change using the AgDRIFT model for aerial, airblast, and ground applications. The main reasons for determining a maximum buffer distance include: 1) the impact of the buffer in reducing exposure decreases with distance, such that at distances far offsite, there is only a small change in the spray drift deposition, 2) the uncertainty that exposure will be similar to what is predicted by the model increases with distance, and 3) the larger a buffer is, the less feasible it is for many applicators. In many cases, the likelihood that spray drift will be partially intercepted by a drift barrier (*e.g.,* trees, crop canopy or other vegetation, buildings) increases with distance, and as such, the model may over-estimate the maximum spray drift buffer because it assumes a bare treated area with no obstructions to intercept spray droplets that drift off-field. The maximum spray drift buffer will be different for different application equipment (*i.e.,* aerial, ground and airblast).

3.2.1.3 Spray Drift Mitigation Measures for Reducing Buffer Distance

EPA reviewed available mitigation measures for reducing the distance of any identified spray drift buffer on a site-specific basis. Mitigation measures for reducing the distance include application parameters (such as specific equipment, application rate, droplet size distribution), the width of the treated area, use of a windbreak/ hedgerow or forested/shrubland area as a physical barrier, or the relative humidity. While many of these measures apply to all spray drift application methods, some application parameters are specific to the type of application. For example, the applicator could choose larger droplet size distributions to reduce the aerial or ground distances. For ground applications, the applicator could reduce the distance by using hooded sprayers or drop nozzles that result in applications under the crop canopy. For all types of applications, the buffer distance can be reduced by using a lower application rate than the maximum rate on the label or by using a windbreak or hedgerow on the downwind side of the application area. **Tables 9-11** summarize the spray drift mitigation measures for reducing the distances associated with aerial, ground and airblast applications to reduce exposure. The **Ecological Mitigation Support Document** has detailed information describing the basis for each percent reduction in distance.

Table 9. Mitigation measures identified when making broadcast aerial applications.

Mitigation measure	% reduction in distance
Application parameters	
Reduced single application rate	% reduction corresponds to application rate reduction from maximum on pesticide product label
Coarse DSD[1]	20%
Very coarse DSD[1]	40%
Spray drift reducing adjuvants	Under evaluation[2]
Reduced proportion of field treated (number of airplane/helicopter passes[3])	
1 pass	55%
2-4 passes	20%
5-8 passes	10%
Other mitigation measures	
Downwind windbreak / hedgerow / riparian / forest/ woodlots/shrubland	50% for basic windbreak/hedgerow 75% for advanced windbreak/hedgerow 100% for riparian/forests/woodlots/shrubland ≥60ft width
Relative humidity is 60% or more at time of application	10%

DSD = droplet size distribution

[1]This % reduction assumes baseline of using medium droplet size for aerial.

[2] EPA anticipates receiving spray drift reduction adjuvant data for insecticide formulations and will be evaluating this as a mitigation measure for insecticides prior to finalizing the Insecticide Strategy.

[3]A spray drift buffer applies to downwind non-target areas. The reduced number of passes applies to the upwind part of the treated field.

Table 10. Mitigation measures identified when making broadcast ground applications.

Mitigation measure	% reduction in distance
Application parameters	
Reduced single application rate	% reduction corresponds to application rate reduction from maximum on pesticide product label
High boom, fine to medium-coarse DSD[1]	55%
High boom, coarse DSD[2]	65%
Low boom, very fine to fine DSD[1]	40%
Low boom, fine to medium-coarse DSD[1]	65%
Low boom, coarse DSD[2]	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	Under evaluation[3]
Reduced proportion of field treated (number of ground application equipment passes[4])	
1 pass	75%
2-4 passes	35%
5-8 passes	15%
Other mitigation measures	
Downwind windbreak / hedgerow / riparian / forest / shrubland/woodlots	50% for basic windbreak/hedgerow 75% for advanced windbreak/hedgerow 100% for riparian/forests/woodlots/shrubland ≥60ft width
Relative humidity is 60% or more at time of application	10%

DSD = droplet size distribution
Low boom height=release height is less than 2 feet above the ground
high boom=release height is greater than 2 feet above the ground
[1]This % reduction assumes baseline of using high boom, very fine to fine droplet size for ground.
[2] Based on evaluation of additional ground spray drift data for an additional 10% reduction in distance beyond fine/medium DSDs.
[3] EPA anticipates receiving spray drift reduction adjuvant data for insecticide formulations and will be evaluating this as a mitigation measure for insecticides prior to finalizing the Insecticide Strategy.
[4]A spray drift buffer applies to downwind non-target areas. The reduced number of passes applies to the upwind part of the treated field.

Table 11. Mitigation measures identified when making airblast applications.

Mitigation measure	% reduction in distance
Application parameters	
Reduced single application rate	Divide % reduction in application rate by 2
Reduced proportion of orchard treated (number of treated rows)[1]	
1 row	70%
2-4 rows	30%
5-10 rows	15%
Other mitigation measures	
Downwind windbreak / hedgerow / riparian / forest / woodlots/shrubland	50% for basic windbreak/hedgerow 75% for advanced windbreak/hedgerow 100% for riparian/forests/woodlots/shrubland ≥60ft width

[1]A spray drift buffer applies to downwind non-target areas. The reduced number of treated rows applies to the upwind part of the treated field.

For aerial, ground and airblast applications, EPA based the spray drift buffer distances (**Table 8**) on assumed swath widths and the number of passes, flight lines, or rows treated. EPA assumes the size and number of pesticide application equipment passes for the airplane/helicopter, tractor and airblast sprayer results in spray drift that deposits on the downwind side of the field/orchard. On a site-specific basis for a broadcast application, if the number of rows treated for an orchard is fewer than EPA's assumptions, there will be less spray drift deposition in the non-target area on the downwind side of the field. For aerial, ground and airblast applications, the applicator could reduce any identified spray drift buffer by the percent shown in **Tables 9-10** depending on the number of passes or treated rows (parallel to the wind direction, perpendicular to the downwind side of the treated field/non-target area). **Figure 5** illustrates such an example. **Tables 9-11** include the percent reductions associated with different numbers of passes/treated rows of the treated field/orchard.

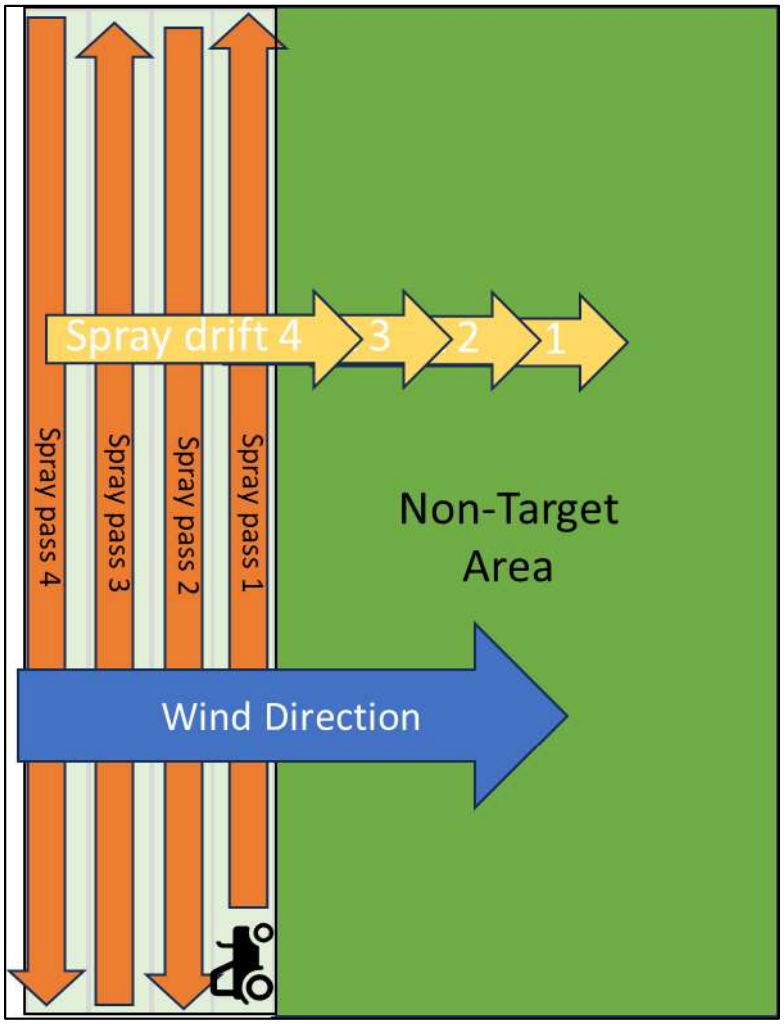

Figure 5. Cumulative spray drift in non-target area from tractor passes on 4 parallel rows on treated area. For example, if this was a ground application and the applicator only made 4 passes of their field, then they could reduce identified spray drift buffer distance by 35%.

To use mitigation measures to reduce the spray drift distance (**Tables 9-11**), the applicator should first consider the application equipment that they plan to use for the application. With this information and the pesticide label, the applicator could identify the appropriate spray drift distance for the pesticide and use (determined by EPA as either lower limit, chemical specific or maximum, **Table 8**). The applicator could then select from any of the appropriate mitigation measures relevant to the application type (either aerial, airblast, or ground). The applicator could add up the corresponding percent reductions for all the mitigation measures selected. This total percent could be applied to the spray drift buffer distance. If the percent is 100% or more, the applicator would not need a buffer as the mitigations put in place already address the potential for population-level impacts. If the percent is above zero and less than 100%, the applicator would need a buffer but the distance would be reduced from that specified on the pesticide product label. For example, if the pesticide product label specifies a 230-foot buffer and there is a downwind windbreak (50% reduction) and the relative humidity is 70% at

the time of the application (10% reduction), the distance that was identified on the product label could be reduced by 60% (50%+10%). The remaining spray drift distance would be 90 feet (100%-60% = 40% * 230 ft). If the applicator used a low boom instead of a high boom, an additional 40% reduction in distance could be used and no buffer distance would be identified (50%+10%+40% = 100%).

3.2.1.4 Description of Managed Areas that can be Subtracted from Spray Drift Distances

As described above, EPA relies upon the AgDRIFT® model for ground and aerial spray drift estimations. The models for ground and aerial drift were developed based on several underlying assumptions, including drift depositing onto a bare field, no obstructions to intercept spray droplets that drift off-field, and a prevailing wind direction. In practice, farms may have managed lands in areas adjacent to a pesticide application. While these managed practices may not be intentionally created for the purpose of mitigating pesticides, their composition and size on the landscape could act like a buffer (*e.g.,* roads) or intercept spray drift (which the model does not take into account) and reduce the distance it may travel. Therefore, to the extent that such managed areas are downwind and immediately adjacent to a pesticide application (and they themselves not being treated with the pesticide), EPA has included these areas in what can be considered within the buffer distance. In other words, grower/applicators could subtract managed areas immediately adjacent to treated field from their identified buffer distance. See **Table 12.**

Table 12. Downwind managed areas that can represent 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). If the pesticide product label has a requirement that prohibits or restricts spray drift in any of these specific managed areas, that prohibition/restriction must 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] Applicators may need to ensure that pesticide use does not cause degradation of the CRP habitat.

In some cases, areas maintained as a mitigation measure for drift or run-off/erosion control, managed areas, and CRP lands could potentially represent habitat for listed species. There can be significant benefits of these habitats to listed species, with a net gain to the species when considering benefits vs. impacts of pesticides. Not all of these areas represent high quality habitat for listed species (e.g., listed plants are not expected to occur within these areas). In some cases, individuals of a species may be attracted to an area that represents habitat (e.g., insects may be attracted to habitat created for pollinators); however, not enough individuals are expected to be impacted within the portion of the

exposed area of the habitat such that there would be an impact on the population that would outweigh the overall benefit provided by creation of the habitat. EPA does not want to disincentivize grower/applicators from providing such habitats, which may have considerable benefits to species, their environment, and pesticide use reductions. Therefore, managed areas that include habitat may be part or all of the spray drift buffer.

Figure 6 and **Figure 7** represent examples of how spray drift buffers can be reduced where a pesticide product label identifies a 50-foot downwind spray drift buffer. The applicator could subtract the 10 foot off-field area downwind where the grower/applicator has CRP land and the 20-foot-wide downwind windbreak, leaving only a 20 foot in-field buffer to meet the identified buffer distance (**Figure 6**). In contrast, if the off-field downwind areas of the CRP land and windbreak totaled 50 feet or more this would equal the identified spray drift buffer distance (as shown in **Figure 7**).

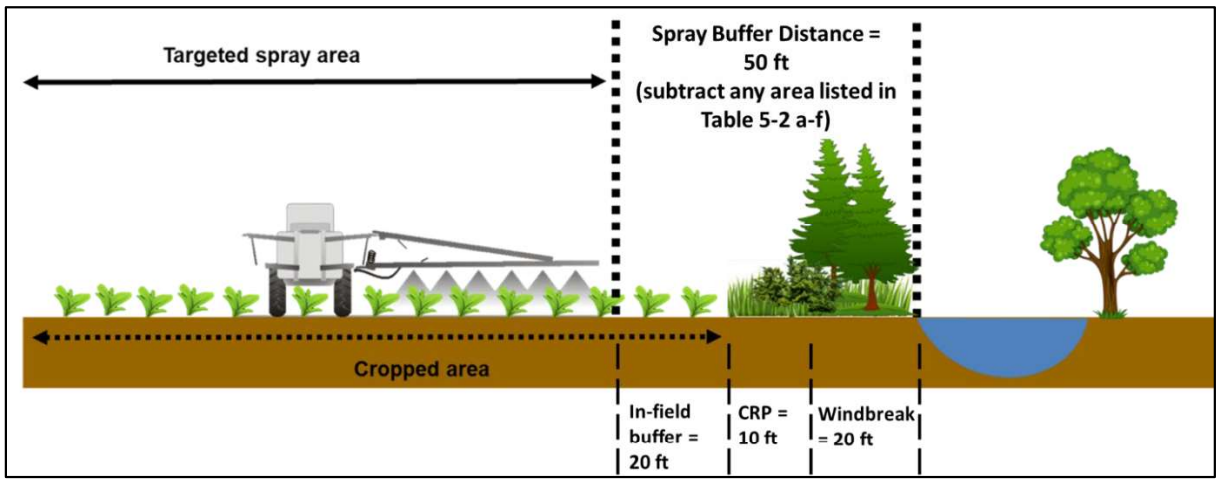

Figure 6. Diagram of the field (cropped area) with a downwind spray drift buffer[27] which includes a portion of the cropped area because the adjacent managed areas are less than the identified spray drift buffer distance.

[27] This figure is based on a diagram from the Pest Management Regulatory Agency of Health Canada (2020), which EPA was permitted to reproduce. The original figure is available at: https://www.canada.ca/en/health-canada/services/consumer-product-safety/pesticides-pest-management/growers-commercial-users/drift-mitigation/protecting-habitats-spray-drift.html. EPA has edited the original figure to provide an example of the areas that can be subtracted from spray drift buffer distances.

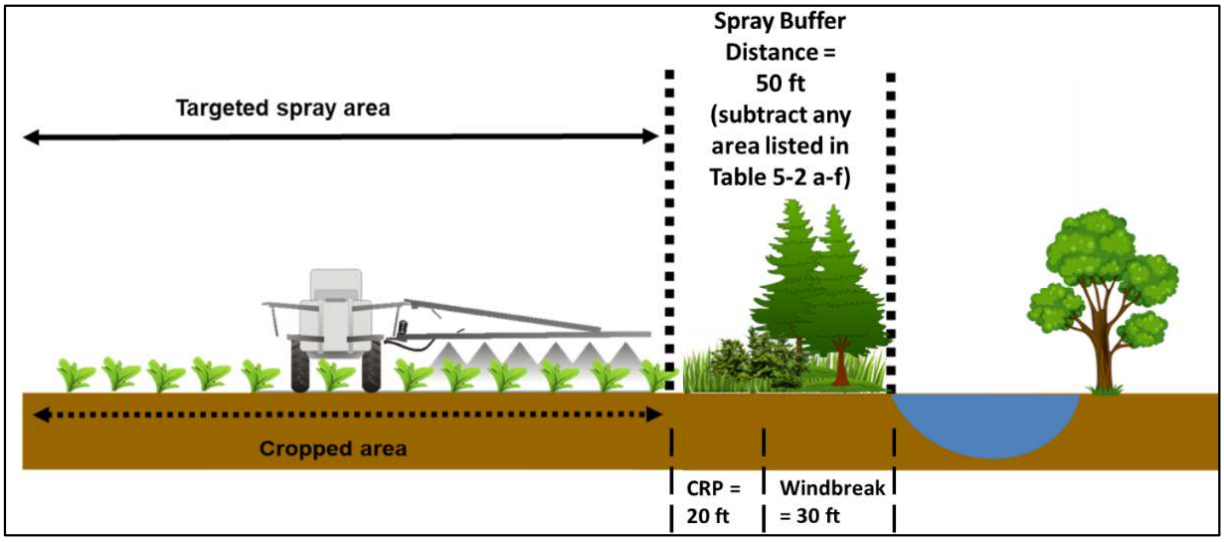

Figure 7. Diagram of the field (cropped area) with no cropped area included in the downwind spray drift buffer because adjacent managed areas are equal to the identified spray drift buffer distance.[27]

3.2.1.5 Spray Drift Exposure Associated with Overhead and Impact Sprinkler Chemigation Systems

Overspray from overhead and impact sprinkler chemigation systems can expose non-target species to insecticides. EPA identified mitigation measures for overhead and impact sprinkler chemigation equipment when it identifies a potential for population-level impacts to listed species. The measures are listed below in **Table 13**. Unlike aerial/ground or airblast applications, it does not include identified spray drift distances (buffers), but rather measures intended to reduce the potential for irrigation overspray into non-target areas. The type and extent of the identified measures depends on the level of the potential for population-level impacts as well as the type of chemigation equipment. The table below and the **Ecological Mitigation Support Document** provides additional discussion and details about the measures identified to mitigate low, medium and high population-level impacts.

Table 13. Mitigation Measures Identified When Making Pesticide Applications via Overhead and Impact Sprinkler Chemigation Systems

Potential for Population- Level Impacts from Step 1	Mitigation Measures	
	Overhead Chemigation[1]	Non-End Gun Impact Sprinklers
Not Likely	None	None
Low	No end gun	Limit throw distance to edge of field (treated area)[2]
Medium	No end gun and one of the following: reduce pressure (<20 psi); reduce release height (<5 ft); have a windbreak[3]	
High	No end gun and two of the following: reduce pressure (<20 psi); reduce release height (<5 ft); have a downwind windbreak[3]	Limit throw distance to edge of field (treated area) AND have downwind windbreak[3]

[1] Refers to center pivot, overhead systems, traveler systems that have sufficient pressure/end guns
[2] This can be accomplished by either reduced pressure and/or reduced throw angle

[3] This can be a windbreak/hedgerow/riparian/forest/shrubland/woodlots. See Mitigation Support Document for additional details.

3.2.2 Runoff/Erosion Mitigation Measures

EPA developed a runoff/erosion mitigation menu that would apply whenever EPA identifies mitigations for non-target species, including listed species. EPA elected to develop a mitigation menu to reduce off-site pesticide exposure via runoff and/or erosion to provide flexibility for grower/applicators to use mitigations that are best for their situation when a pesticide product they want to use includes mitigations. These measures are identified in **Table 15** and described in more detail in the **Ecological Mitigation Support Document** Version 1.0. EPA categorized these runoff/erosion mitigation measures as follows:

- **Application Parameters** that grower/applicators may elect to employ to reduce potential pesticide runoff and erosion (annual application rate reduction, partial field treatment, soil incorporation).
- **Field Characteristics** that are likely to indicate the field will have less runoff and erosion than other fields and thus need fewer mitigation measures to reduce runoff/erosion transport (*e.g.,* fields with a low slope likely have less runoff/erosion, permeable sandy soils have less runoff than high clay content soils).
- **In-field Mitigation Measures** that applicators may elect to employ to reduce potential pesticide runoff and erosion are those that involve the management of the field. (*e.g.,* management of irrigation water, cover crops, or reduced tillage).
- **Adjacent to the Field Mitigation Measures** are those that occur next to the field and down-gradient from where the pesticide application occurs and between the treated field and species' habitat (*e.g.,* grassed waterway, VFS). Some measures may occur on the field and also adjacent to the field, so they are included in both categories (*e.g.,* VFS).
- **Systems that Capture Runoff and Discharge** are those that capture, collect, and discharge runoff through discrete conveyances (*e.g.,* water retention systems such as ponds and sediment basins).
- **Other Mitigation Measures** are those that may be considered but that do not fit into the categories above.

Additional considerations associated with the extent of mitigation associated with any particular field/area includes:

- **Pesticide Runoff Vulnerability**: an analysis of pesticide runoff vulnerability across the lower 48 states that may influence the amount of runoff/erosion mitigation for a particular site.
- **Areas 1000 feet Down-Gradient from Application Areas**: areas where there is not a potential for population level impacts from off-site exposure to runoff/erosion from pesticide applications.
- **Conservation Program and Runoff/Erosion Specialists/Mitigation Tracking:** recognition that growers/applicators that work with a runoff/erosion specialist or participate in a conservation program would likely achieve higher than average mitigation measure efficacy and benefits of mitigation tracking.

As described in **Section 3.2.2.5**, EPA has identified several mitigation measures that when employed on a field by themselves, would result in runoff/erosion exposures that would not likely have a potential for population-level impacts. If the mitigation measures are employed, then no further runoff/erosion mitigations would be needed:

- Systems with Permanent Berms
- Tailwater Return Systems
- Subsurface Tile-drains, *with* Controlled Drainage Structures

In addition, EPA's evaluation indicated the run-off/erosion exposure from several insecticide application methods would be limited and thus the potential for population-level impacts is unlikely. These application methods include the following:

- tree injection;
- chemigation methods, including: subsurface and under non-permeable plastic surfaces;
- soil injection: and
- less than 1/10 acre (<4356 square feet) treated and spot treatment (<1000 sq ft treated) (e.g. when applied with backpack or hand held sprayers;

As detailed in the **Ecological Mitigation Support Document,** for each of the measures included in the run-off/erosion mitigation menu, EPA evaluated their effectiveness at reducing offsite transport via runoff/erosion (high, medium, or low). In general, a mitigation with a low, medium, or high efficacy achieves an average of 10-30%, 30-60%, and greater than or equal to 60% reduction, respectively. EPA's evaluation of the efficacy for each mitigation measure is ultimately based on EPAs best professional judgment of the mitigation's potential to be effective at reducing offsite transport of pesticides.

In order to include as many options as feasible across dozens of measures with varying degrees of efficacy, EPA is planning to utilize a point system for runoff/erosion mitigations to: (1) associate the number of points with each MoD category for runoff/erosion; and (2) assign lower or higher point values to mitigation practices that are less or more effective, respectively, in reducing runoff/erosion. EPA assigned efficacy points to each of the measures on the runoff/erosion mitigation menu based on the efficacy of reducing exposure of the mitigation measure. High efficacy mitigation measures are worth 3 points, medium efficacy measures are worth 2 points, and low efficacy measures are worth 1 point (**Table 15**).

3.2.2.1 Level of Mitigation Identified for Runoff/Erosion

Where EPA determines a potential for population-level impacts associated with runoff/erosion to be low, medium, or high, EPA would identify the level of mitigation needed to reduce exposures so that population level impacts are no longer likely. EPA determines this first based upon the MoDs associated with the use of the pesticide being evaluated, which are related to the potential for population-level impacts. Mitigation measures (or combination of mitigation measures) that achieve three points are functionally equivalent to approximately an order of magnitude reduction in off-field exposure concentrations of pesticides transported via runoff. For erosion-prone chemicals and those bound to sediment, EPA adjusts the points to achieve an order of magnitude reduction. For erosion, 2 points are generally equivalent to an order of magnitude reduction given the lower mobility of soil particles relative to water and increased effectiveness

of mitigation practices in reducing soil in runoff. This order of magnitude reduction is equivalent to the reduction needed to drop from one category of potential for population-level impacts to a lower category (*e.g.,* from high to medium). **Table 14** presents the number of points EPA has identified to address potential for population-level impacts of runoff/erosion to aquatic habitats used by invertebrates (*e.g.,* mussels, insects).

Table 14. Number of Mitigation Points Identified to Reduce Exposure via Runoff and Erosion.

Potential for Population Level Impacts	Magnitude of Reduction in Exposure Needed to Result in a Not Likely Potential for Population-Level Impacts Conclusion	Mitigation Points Identified	
		Runoff-Prone [K_{OC} <1000 or K_d <50][1]	Erosion-Prone [K_{oc} ≥1000 or K_d ≥50][1]
Not Likely	None	None	
Low	10x	3	2
Medium	100x	6	4
High	1000x	9	6

[1] The soil-water distribution coefficient (K_d) and organic-carbon normalized soil-water distribution coefficient (K_{OC}) are measures of the propensity of a chemical to be dissolved in water or sorbed to soil or sediment. K_{OC} and K_d values are measured in studies conducted under OPPTS Guideline 835.1230 (USEPA, 2008). The average K_{OC} or K_d is used to distinguish between runoff-prone and erosion-prone pesticides.

While a multitude of factors determine the fate and transport of a pesticide in the environment, one fundamental physio-chemical property is the sorption coefficient, otherwise known as the Koc[28]. This property describes whether a chemical tends to adsorb to soil particles or remain in water (USEPA, 2008). Chemicals with a higher Koc tend to adsorb to soil and are more likely to be transported by soil erosion, while chemicals with lower Koc tend to partition to water and are more likely to be present in runoff. Several of the runoff/erosion mitigation measures listed in the **Ecological Mitigation Support Document** function by removing soil, and therefore soil-sorbed pesticides, from runoff. This difference between chemicals results in runoff and erosion mitigations being inherently more effective for erosion-prone pesticides. Examples of this phenomena can be seen in the literature for various mitigation measures, including vegetative filter strips, sedimentation basins, and cover crops/mulching. Across these three examples, sediment prone pesticides were found to be 20-30% more efficacious than runoff prone pesticides (**Ecological Mitigation Support Document**). EPA used this difference as the basis for the reducing the number of mitigation points erosion-prone pesticides.

[28] The organic-carbon normalized soil-water distribution coefficient (K_{OC}) is a measure the propensity of a pesticide to be dissolved in water or sorbed to soil or sediment. For some pesticides, sorption is described using the soil-water distribution coefficient (K_d) without organic-carbon normalization. K_{OC} and K_d values are measured in studies conducted under OPPTS Guideline 835.1230 (USEPA, 2008).

3.2.2.2 Runoff and Erosion Mitigation Measures Menu

EPA developed a runoff/erosion mitigation menu that would apply whenever EPA identifies mitigations for non-target species, including listed species. EPA assigned efficacy points to each of the measures on the runoff/erosion mitigation menu based on the efficacy of reducing exposure of the mitigation measure. The menu assigns points to each of the mitigation briefly, as of July 2024, the mitigation measures included on the menu and associated point values are presented in **Table 15**.

Menu measures that have been identified as of July 2024 are described in the **Ecological Mitigation Support Document** Version 1.0, and the mitigation list and point system outlined in that document are expected to be incorporated into the mitigation menu website later in 2024.

On the mitigation menu, EPA has included all runoff/erosion mitigations for which efficacy data is available in an effort to provide options and flexibility in the mitigation measures for the grower/applicator.[29] EPA welcomes efficacy data on additional measures that grower/applicators may be using that are not included here. EPA acknowledges that the mitigation menu will continue to evolve over time and EPA will continue to update the mitigation menu as new information becomes available.

[29] The draft Insecticide Strategy would allow grower/applicators to get credit for measures they already employ if the measures are known to be efficacious for reducing runoff/erosion. If a grower/applicator is already implementing a mitigation measure on the menu, they would be able to implement fewer additional measures on their field to achieve the identified by the draft Insecticide Strategy.

Table 15. Runoff/Erosion Mitigation Measures and Associated Point-Values for Reducing Exposures. [30]

Mitigation Measure Title[1]	Conditions that Qualify[1,2]	Efficacy Classification	Points
Application Parameters			
Reduction in Pesticide Application Rate	Any application 10% to <30% less than the maximum labeled annual application rate	Low	1
	Any application 30% to <60% less than the maximum labeled annual application rate	Medium	2
	Any application ≥60% less than the maximum labeled annual application rate	High	3
Reduction in Proportion of Field Treated[31]	10 to <30% of Field Area treated (Banded application, partial treatment, precision sprayers)	Low	2
	30 to <60% of Field Area treated (Banded application, partial treatment, precision sprayers)	Medium	3
	≥60% of Field Area treated (Banded application, partial treatment, precision sprayers)	High	4
Soil incorporation	Watering-in or mechanical incorporation before runoff producing rain event	Low	1
Field Characteristics[3]			
Field with slope ≤ 3%	Naturally low slope or flat fields; flat laser leveled fields	Medium	2
Predominantly Sandy Soils[4]	Not applicable	Medium	2
In-Field Mitigation Measures[3]			
Conservation Tillage	Reduced tillage, mulch tillage, ridge tillage	Medium	2
	No-till	High	3
Reservoir Tillage	Reservoir tillage, furrow diking, basin tillage	High	3
Contour Farming	Contour farming, contour tillage, contour orchard and perennial crops	Medium	2
In-field Vegetative Strips	Inter-row vegetated strips, strip cropping, alley cropping, prairie strips, contour buffer strips, contour strip cropping, prairie strip, alley cropping, vegetative barrier (occuring in a contoured field)	Medium	2
Terrace Farming	Terrace farming, terracing, field terracing	Medium	2
	Cover crop, double cropping, relay cropping	Low (Tillage used)	1

[30] Current as of Draft Insecticide Strategy Publication Date. The actual menu should be consulted from the website: https://www.epa.gov/pesticides/mitigation-menu.

[31] See the **Ecological Mitigation Support Document** for an explanation of the points for this mitigation measure.

Mitigation Measure Title[1]	Conditions that Qualify[1,2]	Efficacy Classification	Points
Cover Crop/Continuous Ground Cover		Medium (No tillage, short term)	2
		High (No tillage, long term)	3
Irrigation Water Management	Use of soil moisture sensors/evapotranspiration meters with center pivots & sprinklers; above ground drip tape, drip emitters; micro-sprinklers	Medium	2
	Below tarp irrigation, below ground drip tape; dry farming, non-irrigated lands	High	3
Mulching with Natural and Artificial Materials	Mulching with artificial materials	Low	1
	Mulching with natural materials	High	3
Erosion Barriers	Wattles, Silt Fences	Medium	2
Adjacent to Field Mitigations[5]			
Grassed Waterway	Grassed waterway	Medium	2
Vegetative Filter Strips (VFS) – Adjacent to the Field	Vegetative barrier, field border 20 to <30 ft	Low	1
	Vegetative barrier, field border 30 to <60 ft	Medium	2
	Vegetative barrier, field border >60 ft	High	3
Vegetated Ditch	Vegetated ditch	Low	1
Riparian Area	Riparian forest buffer, riparian herbaceous cover 20 to <30 ft	Low	1
	Riparian forest buffer, riparian herbaceous cover 30 to <60 ft	Medium	2
	Riparian forest buffer, riparian herbaceous cover ≥60 ft	High	3
Wetland and Riparian Habitat Improvement	Constructed wetlands, Wetland and Riparian Landscape/Habitat Improvement	Medium	2
Landscape/Habitat Improvement	Terrestrial landscape/habitat improvement 20 to <30 ft	Low	1
	Terrestrial landscape/ habitat improvement 30 to <60 ft	Medium	2
	Terrestrial landscape/ habitat improvement ≥60 ft	High	3
Filtering Devices with Activated Carbon or Compost Amendments	Filters, sleeves, socks, or filtration units containing activated carbon	High	3
	Filters, sleeves, socks containing compost	Low	1
Systems that Capture Runoff and have Controlled Discharges			
Water Retention Systems	Retention pond, sediment basins, catch basins, sediment traps	Medium	2

Mitigation Measure Title[1]	Conditions that Qualify[1,2]	Efficacy Classification	Points
Subsurface Drainages and Tile Drainage Installed *without* Controlled Drainage Structure	Subsurface tile drains, tile drains	Low	1
Other Mitigation Measures			
Mitigation measures from multiple categories (*i.e.*, in-field, adjacent to the field, or water retention systems) are utilized.[6]	See measures in categories above.	Low	1

[1] EPA's mitigation menu and measure descriptions specific to pesticides are available in the following websites: https://www.epa.gov/pesticides/mitigation-menu and https://www.epa.gov/pesticides/menu-measure-descriptions. If the state has a more restrictive requirement, that may be followed instead. Not all measures are applicable to all fields and crops.

[2] Only one of the measures that qualify from a 'mitigation menu item' can be used. For example, a user could get mitigation points for cover cropping or double cropping but not both.

[3] Multiple field characteristics may apply to an individual field.

[4] Soil texture is as defined by USDA's soil classification system. See USDA's Web Soil Survey tool to determine soil texture: https://websoilsurvey.nrcs.usda.gov/app/.

[5] Adjacent to the field mitigations should be located downgradient from a treated field to effectively reduce pesticide exposure in runoff and erosion.

[6] For example, if a cover cropping and adjacent to the field VFS are both utilized, the efficacy of the mitigation measures in combination may be increased.

3.2.2.3 Mitigation Relief based on Pesticide Runoff Vulnerability

The amount of runoff and erosion transport differs across the contiguous U.S., especially due to differences in frequency and amount of rainfall. EPA evaluated the scientific literature and developed analyses to differentiate geographical areas by rainfall and reduced the amount of runoff/erosion mitigation identified in those areas. As described in more detail in the **Ecological Mitigation Support Document**, EPA evaluated the relative vulnerability of areas across the lower 48 states to pesticide runoff using PWC. EPA used a generic runoff-prone chemical with approximately three million scenarios across the lower 48 states to rank runoff vulnerability relative to the modeled maximum scenario. The scale of this modeling simulation was conducted at a much finer resolution than that of EPA's standard aquatic modeling for regulatory actions (*i.e.,* 2-digit HUC resolution).

The evaluation of this information resulted in a determination that pesticide runoff vulnerability can be defined at a county level with four categories (very low, low, medium and high) representing spatially where exposures of pesticides in runoff may be representative of EPA's upper bound estimates (*e.g.,* high pesticide runoff vulnerability counties) compared to areas where concentrations in pesticide runoff are likely being overestimated (*e.g.,* counties with very low pesticide runoff vulnerability). The relative level of pesticide runoff vulnerability that EPA expects for each of these categories is summarized in **Table 16**.

Counties classified as highly vulnerable to pesticides occurring in runoff would reflect those that have the potential for population-level impacts. EPA chose the county level scale to communicate runoff vulnerability to balance ease of communication, data resolution, and environmental variability. For medium, low, and very low vulnerability areas, EPA's evaluation shows the potential for population-level impacts may be increasingly overestimated. To account for this overestimation, EPA will provide mitigation relief in the form of points. EPA assigned relief[32] points to all counties with medium (2 points), low (3 points), or very low (6 points) pesticide runoff vulnerability (**Figure 8**). This county-level relief reduces the amount of additional mitigation that would be identified in areas that do not have high pesticide runoff vulnerability. This approach represents a spatially refined analysis (compared to EPA's national-level screening assessments) where EPA can consider differences in exposure across the country and the amount of relief points align with the magnitude of difference methodology described in Step 2. Just as in Step 2, each order of magnitude reduction is equivalent to 3 relief points, so EPA assigned areas with very low pesticide runoff vulnerability 6 relief points (approximately to 2 orders of magnitude reduction), 3 relief points to areas with low pesticide runoff vulnerability (approximately 1 order of magnitude reduction), and 2 relief points to areas with medium pesticide runoff vulnerability (approximately ½ order of magnitude reduction).

EPA estimates that these relief points may reduce the additional runoff mitigation burden (level of mitigation points identified) for approximately 80% of cultivated agriculture acres and 95% of specialty and minor crop production acres. Relief points can be used when mitigations are applied across the full

[32] EPA defines relief as a level of reduction for required points of a given pesticide and is based on a field's geographic location.

spatial extent of a use pattern (*e.g.*, specific crops) on the general pesticide product label or in PULAs that fall within counties where relief points are available.

Table 16. Categories of magnitude of difference from nationwide maximum pesticide runoff vulnerability score with corresponding associated 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

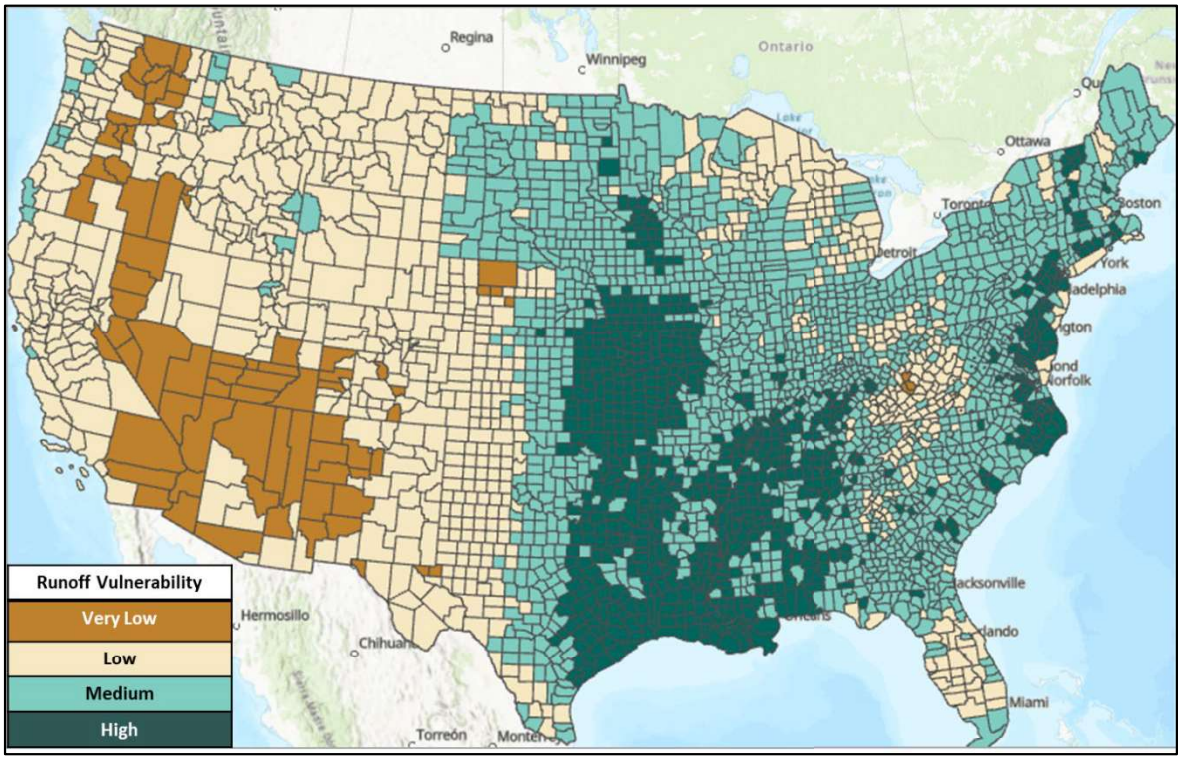

Figure 8. Pesticide runoff vulnerability at the county level.

3.2.2.4 *Run-Off/Erosion* Mitigation Relief for Areas 1000 feet Down-Gradient from Application Areas

Pesticide exposure to non-target organisms and their habitat via runoff/erosion is highest the closer the non-target species are to the pesticide application area. Runoff and erosion are directional, meaning off-site transport occurs when an adjacent area is at a lower elevation than a pesticide application area. As described in the **Ecological Mitigation Support Document**, based on an analysis of overland flow and

sheet flow and the distance to various watersheds and waterbodies, EPA concluded that pesticide concentrations in runoff that has the potential to rise to population-level impacts can extend up to 1,000 feet downslope from a pesticide application. Accordingly, areas beyond 1,000 feet are likely to receive less runoff and erosion from the treated field, if at all, making the potential for population-level impacts unlikely. EPA does not expect to identify runoff/erosion mitigations for pesticide applications areas more than 1,000 feet downwind from a terrestrial or aquatic habitat for listed species. EPA has received comments from a wide variety of stakeholders that EPA should not rely on habitat descriptions to determine if an application is within 1,000 feet of such habitats because stakeholders could not readily identify them based on those descriptions. When EPA develops PULAs for geographically specific run-off/erosion mitigations, it ensures the geographic extent of the mitigations does not extend beyond 1,000 feet from those areas it identifies for conservation of a listed species and its critical habitat (See **Section 3.3.3** for additional information on PULA development). However, in Step 3 of the Insecticide Strategy framework and as described in **Section 3.3.1**, in some cases, EPA expects to identify mitigations for listed species that would apply across the full spatial extent of a use pattern (*e.g*., specific crops) within the contiguous U.S., specifying the mitigations on the general pesticide product label. In this case, EPA similarly does not want growers/applicators to implement mitigations unless they are within 1,000 feet of habitat or a waterbody. To account for this and in light of the stakeholder comments, rather than describe habitats, EPA is relying on managed lands as described in **Section 3.2.1.4** above for spray drift. Many farms have highly managed lands in areas adjacent to a pesticide application and EPA does not expect these managed lands to contain sufficiently suitable species habitat that enough individuals would be exposed to rise to a potential population-level impact. This similarly extends to mitigation measure for drift or run-off/erosion or drift control, and CRP lands. Therefore, to the extent that managed areas represent the entirety of 1,000 feet downslope and immediately adjacent to a pesticide application (and they themselves not being treated with the pesticide), EPA concludes that growers/applicators would not need to implement run-off/erosion mitigations. **Table 17** describes the managed areas that EPA has identified for purposes of run-off/erosion mitigation.

Table 17. Downslope managed areas within 1000 feet downslope of treated area where runoff/erosion mitigations would not be needed.

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. Areas occupied by a building and its perimeter, silo, or other man-made structure 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] Grower/applicators may need to ensure that pesticide use does not cause degradation of the CRP habitat.

3.2.2.5 Mitigation Measures That In and Of Themselves Reduce Exposure Such That Potential Population-level Impacts Are Unlikely.

In some instances, EPA may determine that grower/applicators would not need additional runoff/erosion mitigation measures because a particular measure in and of itself reduces exposure such that potential population-level impacts are unlikely. Each of these measures is described in more detail in the **Ecological Mitigation Support Document** and summarized below.

Systems with permanent berms are treated fields that are surrounded by an elevated border or perimeter (*i.e.,* berms) at the time of application and carried through the cropping season. Under these conditions rainfall and irrigation water is expected to be kept on the treated field. Example cropping systems include cranberry bogs, rice paddies, and drainage ditch & berm systems.

For treated fields with irrigation tailwater return systems, all runoff water from rainfall or irrigation is collected and stored on site for later use. Thereby, runoff and/or erosion offsite from the field is not expected. Tailwater return systems are frequently paired with furrow and border-strip irrigation systems in both row and field crop agriculture.

If the field has subsurface drainage installed and maintained (*e.g.*, tile drains), runoff from the field will be greatly reduced. In order to maintain protection of non-target taxa, the subsurface tile drains must release the effluent (water) into water-controlled drainage structures or a saturation buffer zone that do not release water into downstream off-farm aquatic areas. Runoff from the entire field would need to be controlled and directed into a pond/saturation zone.

3.2.2.5 Conservation Program, and Runoff/Erosion Specialist, and Mitigation Tracking

EPA's evaluation of available efficacy data for many of the runoff/erosion mitigation measures demonstrates that the efficacy of many mitigations is highly variable from one study to the next (and from site to the next). For example, for some measures, studies show that efficacy may range from 0% to 100%. For any given mitigation measure, a range of efficacy is expected depending on the specific implementation of the measure, the environmental conditions of the area, site and soil characteristics of the treated field, maintenance, upkeep of the mitigation measure, and the physical-chemical properties of the pesticide.

Often, grower/applicators work with a technical expert in runoff/erosion control or a conservation program with a goal of reducing runoff/erosion. Because these experts consider and make recommendations for the site-specific conditions, when a grower/applicator installs a runoff/erosion measure to the specifications from such an expert, EPA has higher confidence that mitigation measures identified and implemented at the field level would achieve the higher end of the available efficacy data. As such, EPA is providing mitigation points for growers/applicators that work with a qualifying technical expert **or** participate in a qualifying conservation program.

A grower/applicator may receive mitigation points working with a technical expert or participating in a conservation program, but not both. The grower/applicator would receive points for any of their fields

that are included in the expert consultation or conservation program, which could be an entire farm or a fraction of it (e.g., some fields, but not all within a farm). The grower/applicator would not get additional points for both working with an expert/specialist and for participating in a conservation program, since the expert/specialist is inherently part of the program. Additionally, these points are not applicable to each mitigation measure but rather would be in addition to the points a grower/applicator obtains from other mitigation menu items (*e.g*., if the farm is located in an area of low run-off vulnerability) and for implementing mitigation measures. Each of these options and the associated mitigation points are described in more detail below.

3.2.2.5.1 Follow Recommendations from a Runoff/Erosion Specialist

Grower/applicators may work with a technical expert to develop mitigation plans that work for their field and that are efficacious in reducing runoff and/or erosion. As described above, when a grower/applicator is working with a technical expert who embodies the characteristics below, EPA expects that the mitigation measures would be selected and implemented considering site-specific conditions, including the soil type, field slope, hydrology, local climate, crop(s) grown, pest concerns, drainage systems, irrigation needs, and equipment availability. Specific cropping systems and regions have established norms and practices based on real-world experience that on-site professionals (*i.e*., technical experts) can account for in the planning process. In this case, EPA expects the efficacy of runoff/erosion mitigation measures would be on the higher end of the range of efficacy. To account for this, EPA is providing one runoff/erosion mitigation point to grower/applicators that work with a runoff/erosion technical expert that meets the characteristics described below. The point for working with the technical expert is in addition to the points for implementing mitigation measures identified in the strategy.

EPA has reviewed available information regarding characteristics that often apply to meet the description of a technical expert. At a minimum, there is usually an education (and a continuing education) and an experience component. Based on this review, EPA identified three benchmarks for technical experts, which include:

- Have technical training, education and/or experience in an agricultural discipline, water or soil conservation, or other relevant discipline that provides training and practice in the area of runoff or erosion mitigation technologies/measures; **And**
- Participate in continued education or training in the area of expertise which should include run off and erosion control; **And**
- Have experience advising on conservation measures designed to develop site specific runoff and erosion plans that include mitigation measures described in EPA's Mitigation Website.[33]

EPA has identified the following examples of technical experts: NRCS and similar state or regional level program staff, Certified Crop Advisor, Pesticide Control Advisor, Certified Professional Agronomist, National Alliance of Independent Crop Consultants (NAICC), EnviroCert International, Inc., Certified

[33] EPA's mitigation menu is available at: https://www.epa.gov/pesticides/mitigation-menu and a description of the mitigations is available at https://www.epa.gov/pesticides/menu-measure-descriptions.

Professionals in Erosion and Sediment Control, Technical Service Providers, and extension agents. **EPA acknowledges that this list is not exhaustive, and the inclusion of an organization should not be construed as an endorsement of any particular group by EPA.**

3.2.2.5.2 Participate in a Conservation Program

Conservation programs provide technical expertise as described above, as well as additional support to grower/applicators. Based on EPA's review of available information on existing programs, this support may include oversight in the form of a review of design, installation, and upkeep/maintenance plan for the identified mitigations. In addition, the programs typically include documentation demonstrating the site-specific plan meets any program requirements.

While conservation programs are not solely designed to reduce offsite transport of pesticides, several of the same types of mitigations that reduce offsite transport of nutrients and/or soil erosion from an agricultural field also reduce offsite transport of pesticides. Evaluating a field for the purpose of reducing nutrients in runoff and/or soil erosion is likely to result in similar recommended mitigations as those included in the runoff mitigation menu.

However, with few exceptions, EPA is not aware of any conservation programs that are designed specifically to reduce offsite transport to an extent where population-level impacts to listed species are unlikely. Therefore, while existing conservation programs may recommend similar mitigation measures, these measures may or may not be enough to address potential impacts to listed species. In addition, data is not readily available on the extent to which grower/applicators that participate in these conservation programs (and participation is voluntary) implement all program recommendations. For these reasons and given the goals of the strategies, EPA is not able to provide a full exemption for these programs at this time. Rather, EPA is providing two runoff/erosion mitigation points to grower/applicators that participate in a conservation program. The additional mitigation point provided for participation in a conservation program over consulting a technical expert is because programs include some additional minimum characteristics summarized below.

EPA has developed the following minimum characteristics for a conservation program:

- The program has to provide advice from individuals who meet the same benchmarks provided above for technical experts; **And**
- The program provides site-specific guidance tailored to the grower/applicator's crop and/or location; **And**
- The program focuses on reducing or managing runoff and/or erosion (including for example, soil loss, soil conservation, water quality protection) from agricultural fields or other pesticide use sites; **And**
- The program provides documentation of program enrollment. EPA is **not** suggesting that this documentation be provided to EPA; **And**

- The program includes verification of implementation of the recommended measures or activities (measures were established and maintained). Verification can be done through the conservation program and provided to the program enrollee. Verification is **not** required to be submitted to EPA.

Note: Past participation in programs that meet the minimum characteristics also allows users to claim these mitigation points, provided that measures are currently on the field, have been maintained over time, and are recertified by a runoff and erosion technical expert [federal, state, or local; *e.g.*, Certified Crop Advisor, Pesticide Control Advisor, Conservation Crop Protector, Certified Professional Agronomist, National Alliance of Independent Crop Consultants (NAICC), agronomists that are part of grower cooperatives].

3.2.2.5.3 Mitigation Tracking

All of the mitigation measures identified in in this support document (and any associated strategy) have been determined by EPA to provide some level of reduction of the potential for population-level impacts to listed species from pesticide exposure in runoff/erosion. Keeping track of the mitigations a grower/applicator employs at the field and farm level could provide several benefits to the grower/applicator. Tracking of the employed mitigation measures could help a grower/applicator ensure that they are achieving the number of points to satisfy any labeling requirements that include mitigations to address population-level impacts. Additionally, tracking the mitigations employed could assist with future planning of farm needs, and is generally aligned with the concepts of agricultural best management practices (commonly known as BMPs). Where a grower/applicator has a well thought out plan for the growing season which includes the tracking of mitigation measures employed EPA would have increased confidence that measures have been implemented and properly accounted for. Therefore, EPA is assigning one available point for any grower/applicator who tracks their mitigations in addition to any points for working with a specialist or participating in a conservation program. Working with a runoff/erosion specialist and/or participation in a program is not required to be eligible for this point, and therefore this point is available for any grower/applicator that tracks their mitigation measures.

3.2.3 Mitigation Measures and Additional Considerations for Listed Terrestrial Invertebrates from On-Field Exposure

While **Sections 3.2.1** and **3.2.2** describe mitigations to address potential off-field exposures that may result in population level impacts, EPA also considered the extent to which listed terrestrial invertebrate species are likely to be on the field at the time of an agricultural use insecticide application such that exposures might lead to potential population-level impacts. To evaluate on-field species that might raise to the level of population-level impacts, EPA first conducted a screen based on the extent of overlap of a species range with USDA's Cultivated Cropland Data Layer (CDL)[34] and incorporated known areas of insecticide usage (based on the Census of Agriculture (CoA) and California Department of Pesticide

[34] https://www.nass.usda.gov/Research_and_Science/Cropland/SARS1a.php