EPA’S ECOLOGICAL MITIGATION MEASURES

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OFFICE OF PESTICIDE PROGRAMS USEPA

MAY 09, 2024

AGENDA

- Welcome!
- EPA Herbicide Strategy Update
- Mitigation Relief
- Runoff/Erosion Mitigation Measures
- Spray Drift Mitigation Measures
- Future Considerations
- What and How to Submit Information

HERBICIDE STRATEGY UPDATES

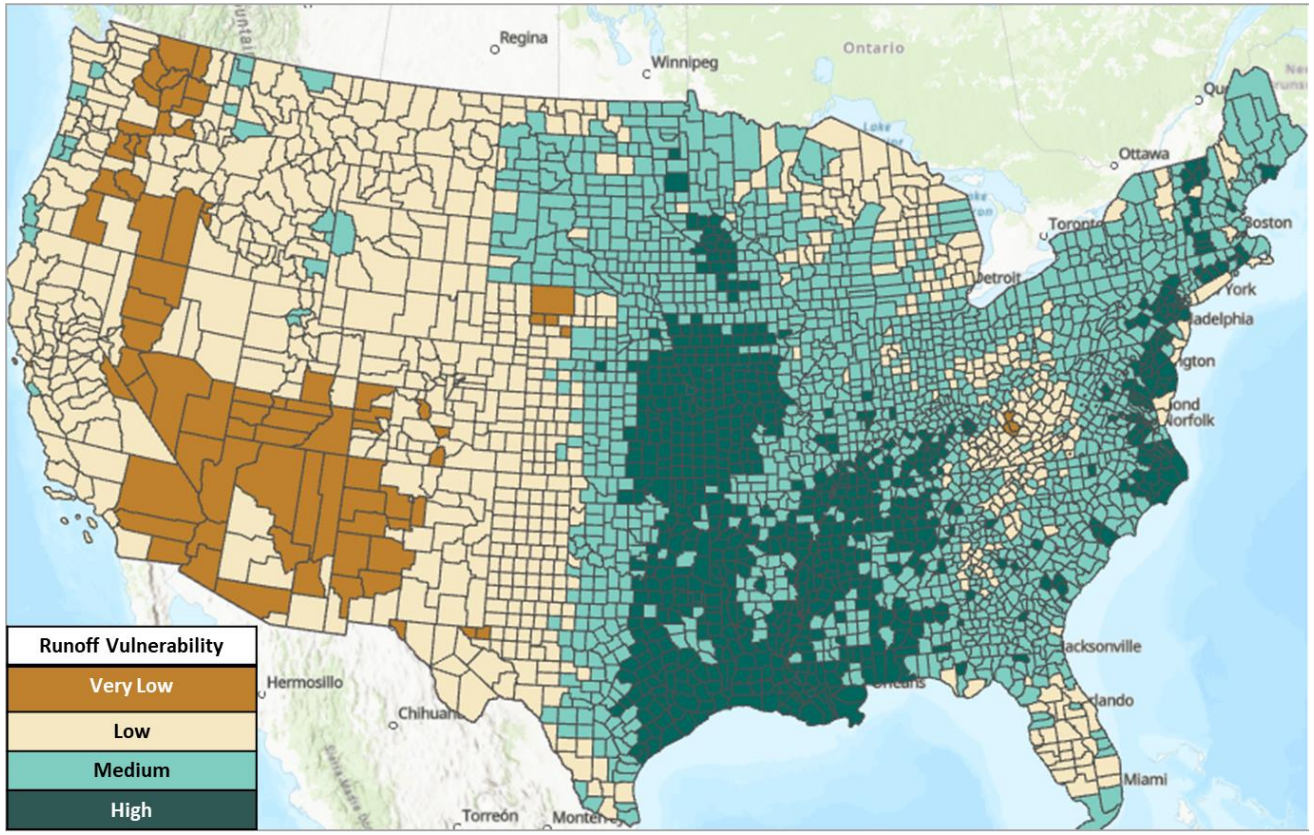
- April 16th EPA released an update to the draft Herbicide Strategy
- High Level Summary of the Update
  - increase the flexibility for growers
  - reduce the amount of mitigation needed when growers already adopt practices to reduce pesticide runoff or where runoff is minimal
  - refining the Pesticide Use Limitation Areas (PULAs)
  - changing the description of the decision framework in response to comments that it is too hard to understand
  - reiterates that the strategy itself does not impose any requirements or restrictions on pesticide use

CONSIDERATIONS TO REDUCE THE REQUIRED RUNOFF/EROSION MITIGATIONS AT A FARM LEVEL

- “Mitigation Relief” – giving points to the farm
- Flat Lands or Minimal Precipitation
- Conservation Program Participation
  - working with a runoff/erosion specialist
  - participating in an existing program that meets minimum criteria that USDA, EPA and FWS are developing

PESTICIDE RUNOFF VULNERABILITY

- EPA reevaluated the potential for pesticide runoff and expects to describe pesticide runoff vulnerability at the county level rather than relying on Interstate Hwy 35 and US Route 395
- More relief (points) to all counties with medium, low, or very low pesticide runoff vulnerability
- Approximately 80% of cultivated agriculture acres and 95% of specialty and minor crop production acres may receive mitigation relief



RUNOFF MITIGATION MEASURES

- General Mitigation Measure Categories
  - On-field Mitigation Measures
  - Adjacent to the Field Mitigation Measures
  - Application Parameters
  - Systems that Capture Runoff and have Controlled Discharges

- Farm vs Field
  - some mitigation measures (e.g., grassed waterways; constructed wetlands; tailwater return systems) are serving as measures typically at a farm level
  - points would be applicable for each field that is serviced by these measures (e.g., connected hydrologically)
  - some mitigations are strictly field based (e.g., application rate; field slope; reduced tillage management; cover crops)

ON-FIELD MITIGATION MEASURES (RELEVANT TO FIELD)

- Application Area Slope (existing measure)
  - updating description to align with USDA's description (≤3%)
  - evaluating the available efficacy information and expecting to increase the relief (points) for flat fields
- Predominantly Sandy Soils (existing measure)
- Reduced Tillage Management (existing measure)
  - considering breaking into multiple categories based on the intensity of tillage

Photo credit: Natalie Lounsbury

ON-FIELD MITIGATION MEASURES (RELEVANT TO FIELD)

- Contour Farming (existing measure)
- In-field Vegetative Filter Strip (existing measure)
- Terrace Farming (existing measure)
- Cover Crop/Continuous Vegetation (existing measure)
  - considering different categories related to duration of cover crop in place relative to crop planting and presence during crop establishment.
- Irrigation Water Management (existing measure)
  - considering different categories related to the release height of the irrigation mechanism relative to the field surface

Photo Credit: Tim Martinson

Photo Credit: Ajay Nair

ON-FIELD MITIGATION MEASURES (RELEVANT TO FIELD)

- Mulching with Natural Materials (existing measure)
- Reservoir Tillage (potential new measure)
  - creates depressions in the soil in the rows between the crop plants which collects allows for increased water infiltration into the soil.
- Soil Carbon Amendments (potential new measure)
  - applied to soil which are intended improve soil structure and increase pesticide sorption therefore reducing runoff concentrations
- Erosion Barriers (potential new measure)
  - a physical barrier to control soil erosion by capturing sediment and reducing flow velocity allowing for infiltration and reducing runoff

Photo Credit: Tim Martinson

ADJACENT TO THE FIELD MITIGATION MEASURES (RELEVANT TO FARM OR FIELD)

- Managed areas are the only landscapes for at least 1000 ft down gradient from the application area (existing exemption)
  - Considering refinement to the description
- Vegetative Filter Strip Adjacent to the Field (existing measure)
  - Considering an expanded description
- Grassed Waterways (existing measure)
- Vegetated Ditch (existing measure)


Source: Google Earth, 2024


Source: USDA, 2020

ADJACENT TO THE FIELD MITIGATION MEASURES (RELEVANT TO FARM OR FIELD)

- Non-Flooded Riparian Buffer (existing measure)
- Wetland and Flooded Riparian Habitat Improvement (existing measure)
- Terrestrial Habitat/Landscape Improvement (potential new measure)
  - Description may include terrestrial habitat improvements located in an area down gradient from an application site that would collect or receive runoff/erosion
- Carbon Amendments Adjacent to the Field (potential new measure)
  - Carbon amendments used in filters, sleeves, socks or filtration units for receiving drains or water outlets adjacent to agricultural fields

Source: USDA National Agroforestry Center, 2021

Source: pollinator.org

APPLICATION PARAMETERS (RELEVANT TO FIELD)

- Less than labeled maximum annual application amount per acre (existing measure)
  - goal is to reduce maximum annual exposure but still maintain efficacy
  - EPA is clarifying the “rate reduction” measure description and plans to add language reinforce resistance management
  - example approaches
    - partial field treatment (e.g.; banded, spot, partial area, precision agriculture or sprayers)
    - reduced number of applications (e.g.; only apply 1 time if 2 apps are allowed = 50% reduction in annual application = 5 pts)
- Soil incorporation (existing measure)

SYSTEMS THAT CAPTURE RUNOFF AND HAVE CONTROLLED DISCHARGES (RELEVANT TO FARM OR FIELD)

- Retention Ponds and Sediment Basins (existing measure)
- Subsurface or Tile Drainage *with* Controlled Outlet (existing exemption)
  - EPA plans to clarify that fields with tile drainage *without* controlled outlets would be eligible for all measures in the mitigation menu
- Permanent Elevated Field Berm Systems (potential new measure or exemption)
  - characterized as having a raised boundary of the field
- Irrigation Tailwater Return Systems (potential new measure or exemption)
  - characterized as having a management system to reuse runoff

SPRAY DRIFT MITIGATION MEASURES

EPA expects to update its aerial spray drift modeling, revise the spray drift mitigation measures to expand flexibility, and simplify how a person determines buffer distances in the field.

- Maximum Spray Drift Buffers (existing measure)

- Ways to reduce the buffer
  - downwind windbreaks/hedgerows
  - hooded sprayers
  - less than labeled single maximum application amount per acre
  - relative humidity
  - change from finer to coarser DSD
  - crop on field
  - windspeed: 3 to 7 mph
  - adjuvants (potential new measure)

Source: https://seminolecropnews.files.wordpress.com/2011/06/dsc6625.jpg

SPRAY DRIFT BUFFER CLARIFICATIONS

EPA plans to simplify how a person determines buffer distances in the field.

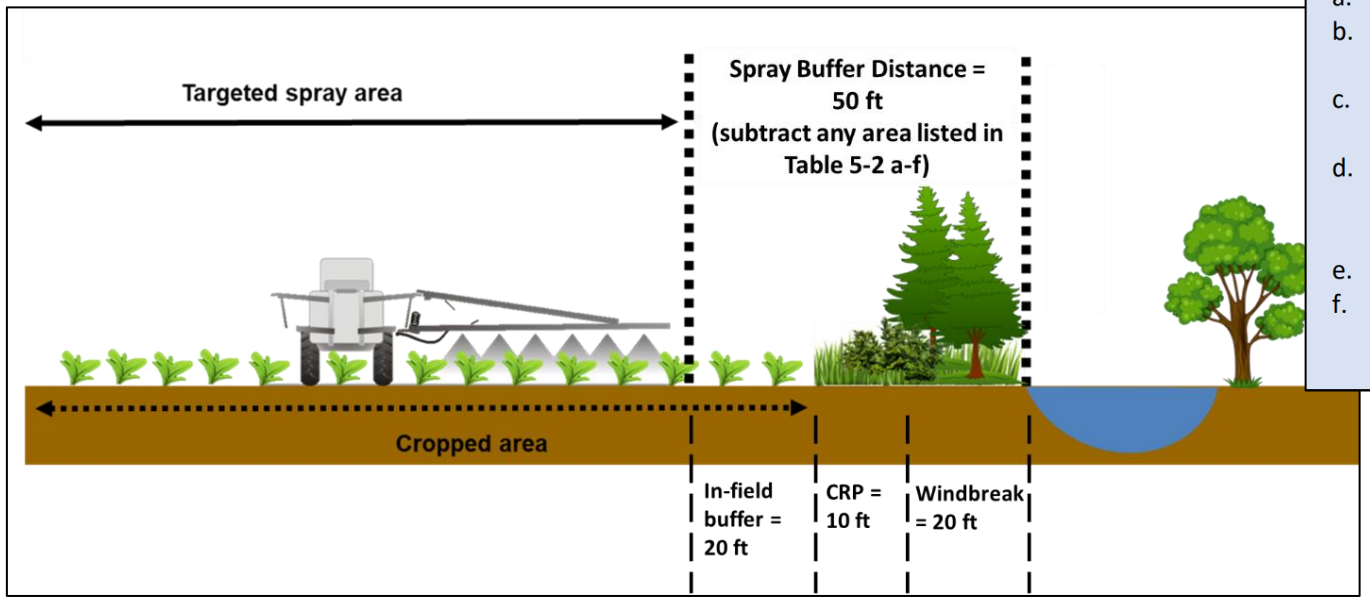


Table 1. Downwind managed areas that can be included as part of a spray buffer.

When spray drift buffers are identified as mitigations to protect listed species, the following managed areas can be subtracted from a spray drift buffer distance if they are immediately adjacent to or contiguous with the treated field in the downwind direction:

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), 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.

OTHER SUGGESTED MITIGATIONS THAT EPA HAS NOT INCLUDED

- polyacrylamide (PAM)
  - a water absorbing polymer that has been used in industrial water treatment
- flooded agricultural practices
- crop row spacing

If more information about these practices is made available, EPA will consider adding these measures to the mitigation menu in the future.

OTHER SUGGESTED MITIGATIONS NOT APPLICABLE TO HERBICIDE USE ON CULTIVATED AGRICULTURE

NRCS 512: Forage and Biomass Planting
NRCS 511: Forage Harvest Management
NRCS 548: Grazing Land Mechanical Treatment
NRCS 453: Land Reclamation, Landslide Treatment
NRCS 528: Prescribed Grazing
NRCS 550: Range Planting
NRCS 381: Silvopasture
NRCS 561: Heavy Use Area Protection
NRCS 578: Stream Crossing
NRCS 590: Nutrient Management
NRCS 614: Watering Facility
NRCS 432: Dry Hydrant

CONSIDERATIONS FOR POTENTIAL FUTURE INFORMATION TO SUPPORT ADDITIONAL MITIGATIONS

Characterization of the mitigation practice

- descriptive information aids in understanding the practice
- consider descriptive information on the purpose, how it is implemented in practice, and how it would reduce spray drift or runoff or erosion for pesticides
- consider the similarity of the new mitigation to those already identified as potential mitigation measures and if it is a common practice

Characterize the potential efficacy of a mitigation practice

- scientific principles
- comparison to current mitigation measures that share common features
- modeling
- empirical evidence from scientific studies

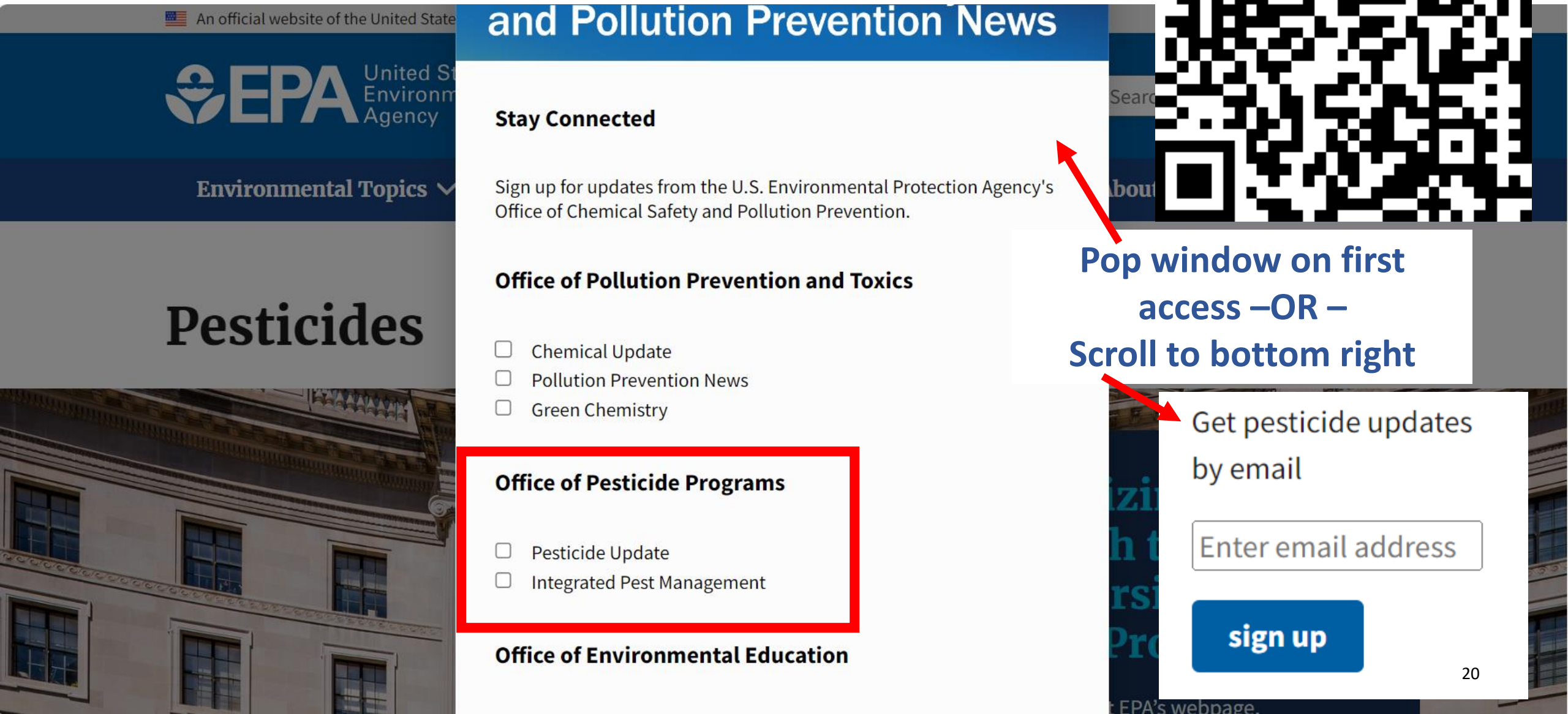
EMPIRICAL EVIDENCE CONSIDERATIONS

Consider study design and methods used to measure mitigation efficacy in similar studies (if applicable)

Information that could be helpful when evaluating empirical evidence, includes, but is not limited to describing:

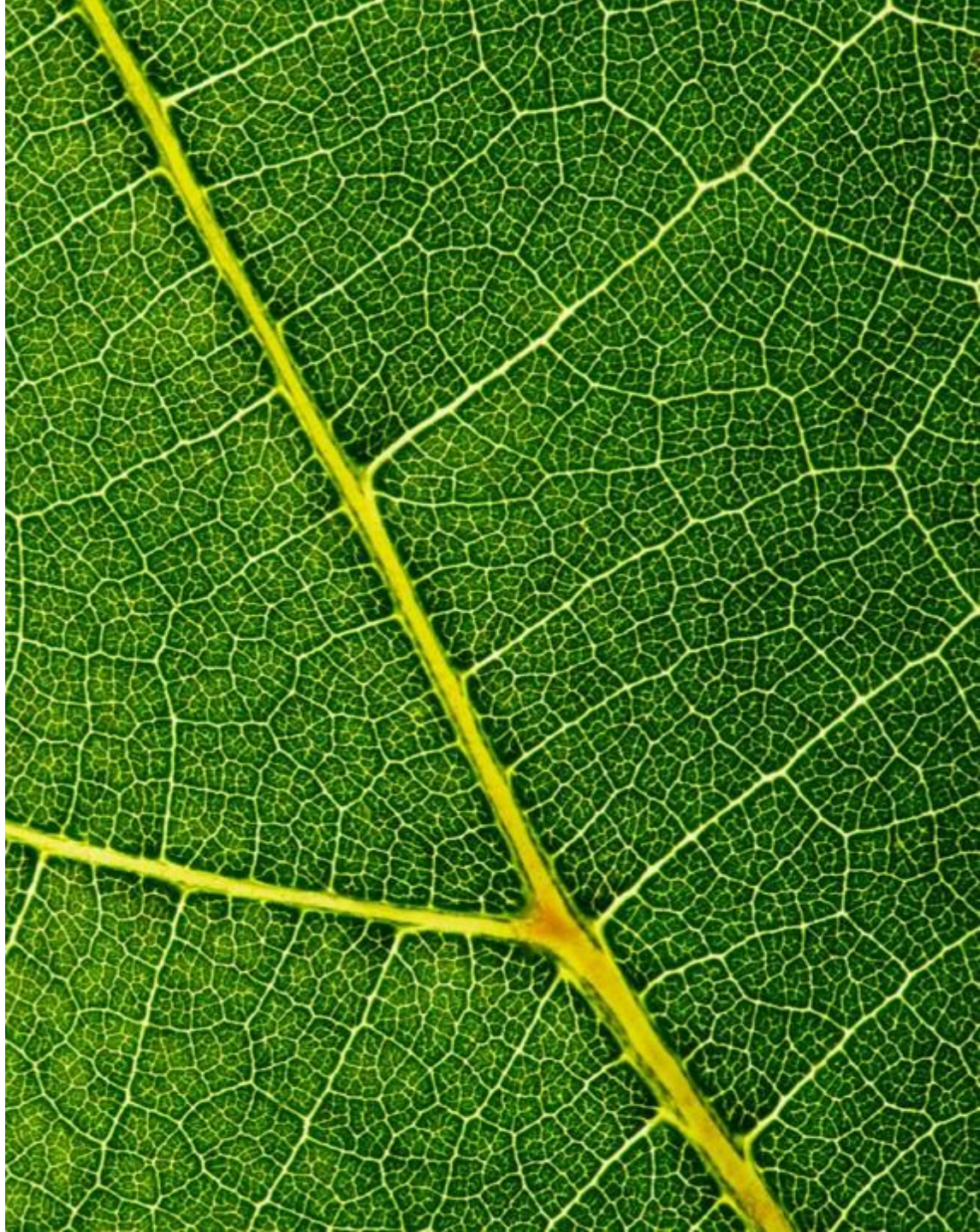
- design: use of controls; sufficient replication
- environmental conditions prior to and during the test
- methods: test substances; application method; sampling design
- efficacy results: reporting statistical method and outcomes; information necessary to provide a complete and accurate description of the test procedures and results

Sign Up for OPP Updates



QUESTIONS AND ANSWERS

THANK YOU!



“Implementation of Endangered Species Act Pesticide Mitigations: Developing Localized Solutions for Diverse Cropping Systems in Washington and Oregon”

Western IPM Center Work Group Grant

Dani Lightle (OSU)
Gary Bahr (WSDA)
Annie Krueger (CSI)

Letters of Support

Oregon State University
WILBUR-ELLIS AGRIBUSINESS
Oregonians for Food & Shelter
SALMON SAFE
WSDA
U.S. FISH & WILDLIFE SERVICE
NAICC
EDUCATE • INVEST • PROTECT FESTF.org
OREGON DEPARTMENT OF AGRICULTURE
OREGON SEED COUNCIL

Create a working group to develop a regional approach for implementing pesticide ESA mitigations that leverages local expertise and addresses the needs of agricultural and conservation communities.

Project Grant and Team

- Western IPM Center Grant Funded, February 2024
  - This project was funded in part by the USDA National Institute of Food and Agriculture, through the Western Integrated Pest Management Center

- Our principal grant leads:
  - Dani Lightle, PhD, IR4 Specialty Crops Pesticide Registration Research Leader, Oregon State University
  - Annie Krueger, PhD, Senior Consultant, Compliance Services International, Environmental Toxicology & Pollinator Risk Assessment
  - Gary Bahr, Science Liaison, SFIREG Chair (Past), AAPCO ESA Workgroup Co-Chair, WSDA

- Our Key Agency Cooperators:
  - Washington State Department of Agriculture
  - Oregon Department of Agriculture
  - Kathryn Rifenburg, Oregon Department of Agriculture, Salem, OR
  - Ryan DeWitt, National Marine Fisheries Services (NMFS), Lacey, WA
  - OSU and WSU Faculty, Extension and Research Station staff

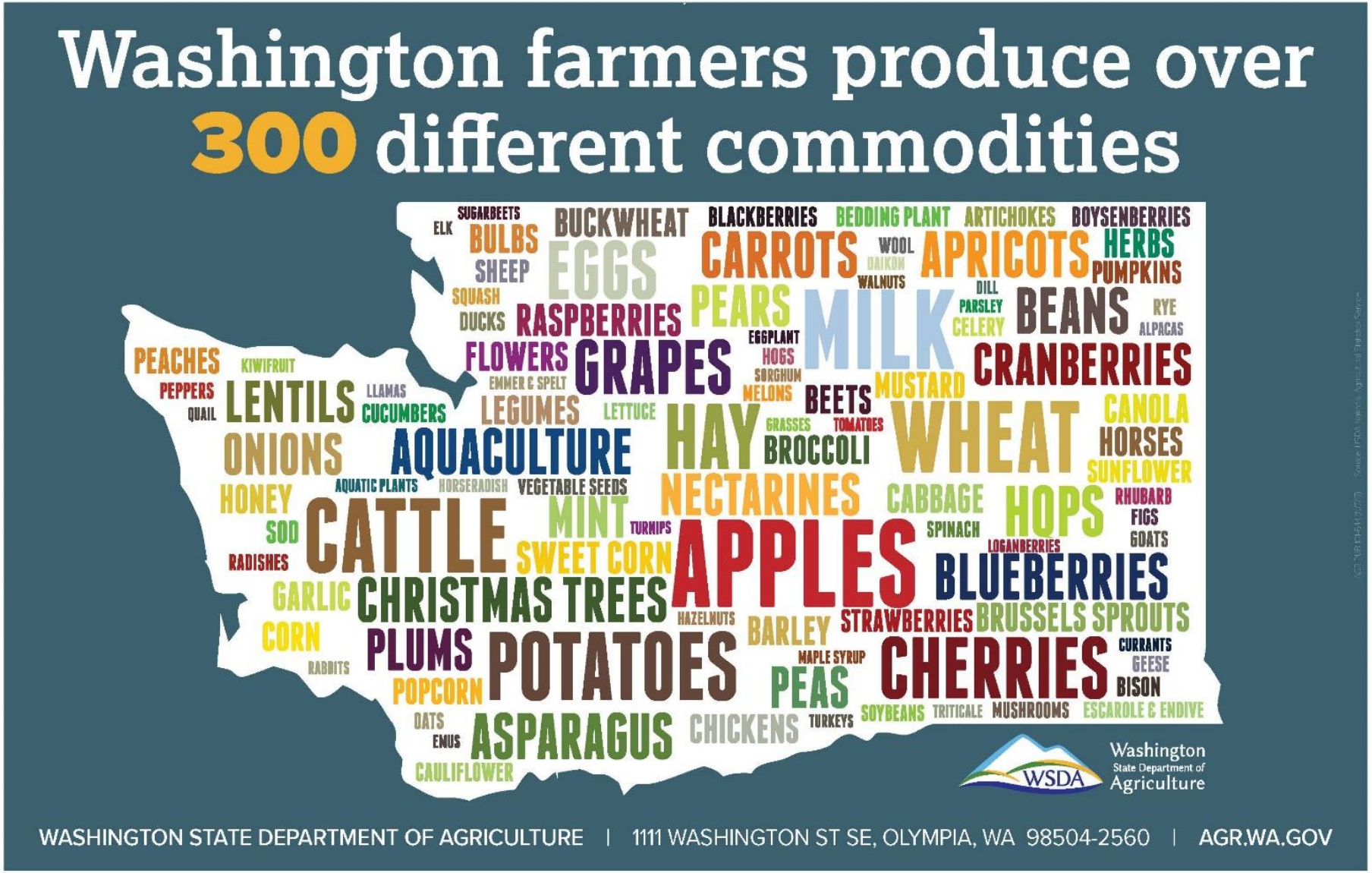
USDA United States Department of Agriculture National Institute of Food and Agriculture

Western IPM Center

Implementation of Endangered Species Act Pesticide Mitigations:

Developing Localized Solutions for Diverse Cropping Systems in Washington and Oregon

Washington Agriculture Diversity

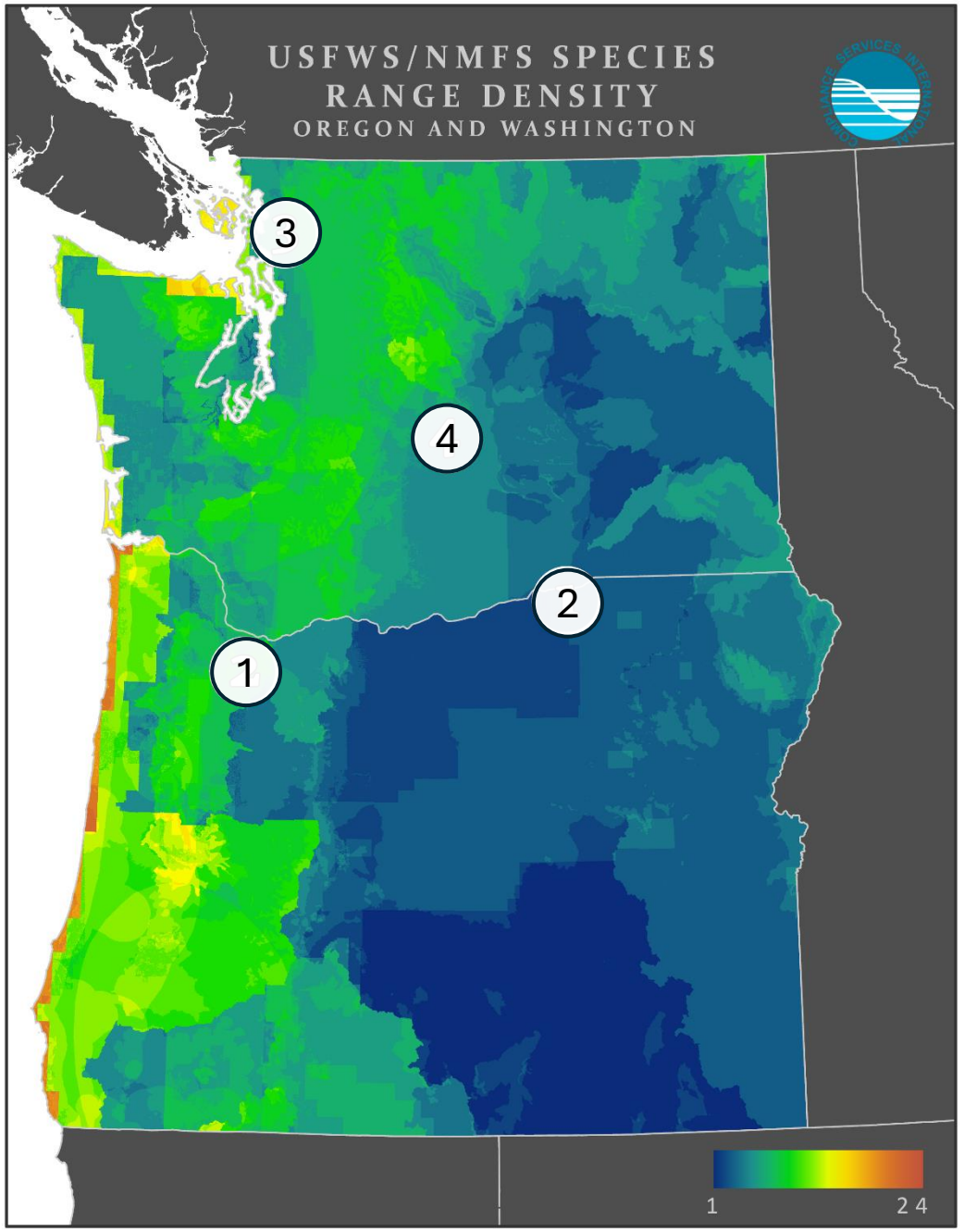


Oregon Agriculture Diversity

OREGON DEPARTMENT OF AGRICULTURE

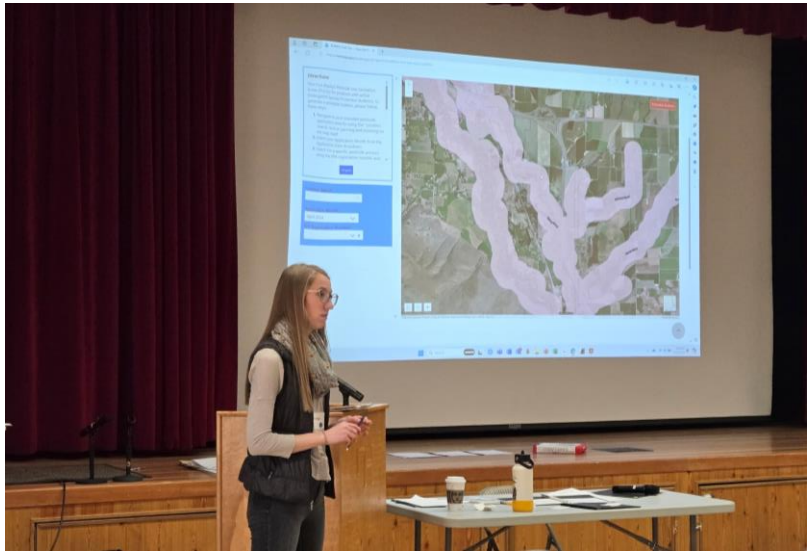
Workshop Locations

1. **Salem, Oregon** – March 20th
   - High crop diversity and highest overlap with FWS species, all specialty crops, wine, hops, seed production, hazel nuts, vegetables, turf, GCSAA
   - Overlap with NMFS, Taylor's Checkerspot (Vulnerable Species Pilot) and EPA Cyantraniliprole PULAs
2. **Hermiston, Oregon** – March 26th
   - Dry-land crops and irrigated specialty crops, GCSAA
   - Overlap with NMFS PULAs
3. **Mount Vernon, Washington** – March 28th
   - Specialty crops, seed crops, small berries, cane berries, potatoes, bulbs, turf, urban pest control, urban, turf, GCSAA
   - Overlap with NMFS PULAs and Taylor's Checkerspot (Vulnerable Species Pilot)
4. **Ellensburg, Washington** – April 12th
   - Tree Fruit, Irrigated Ag, Dry-land crops, timothy hay, potatoes, peas, lentils, other specialty crops, urban, pest control, landscape professionals
   - Overlap with NMFS PULAs




Agenda


WELCOMES
ENDANGERED
SPECIES ACT
IMPLEMENTATION
WORKSHOP




Agenda

Workshop Activities

1. Panel/Open Discussion to Introduce ESA Pesticide Mitigations
   - How did we get here
   - Introduce NMFS PULAs in the workshop region
2. Introduction to runoff mitigations (conservation practices)
   - Without definitions/standards, how are people thinking about these practices, points system, and which practices are most relevant to them?
   - Do they have other relevant mitigation practices?
3. Review roles of different stakeholder groups (Agriculture, Regulatory, Conservation, University/Other)
   - Exercise on how people on the ground are seeing their role and the role of the other sectors in implementing ESA pesticide mitigations?

Workshop Activities

4. Capture feedback on Bulletin Language for terrestrial and aquatic PULAs
   - When asked to draw out the implementation of the bulletin, are people correctly interpreting the bulletin language? If there is confusion, what words/concepts are the most challenging?
5. Gather input on what each stakeholder group needs to implement ESA Pesticide mitigations
   - In the short term (<1 year), mid term (1-5 years), and long term (>5 years) what do stakeholder groups need to more successfully navigate, prepare for and implement mitigations.
6. Post Workshop Survey went out to licensed applicators in OR and WA

1. Introduction and Insights on ESA Mitigations - Q&A and Takeaways

"We have many specialty crops, diverse farms, many with small fields, precise ag and irrigation already, a lot of flat ground, dry and wet sides, a lot of mitigation already"

"We should have the opportunity to devise mitigations that reflect our systems and history of ESA protection programs on farms"

"How do we know what we're doing is enough?"

"Economics should be addressed, farm viability, how will we compete with neighbors not in a PULA, and foreign markets that don't have to do this?"

2. Introduction to runoff mitigations

Runoff Mitigations
Vegetated filter strip
Filter Strip Contour buffer strips
Strip cropping
Contour farming
Alley cropping
Terrace
Mulching with natural materials
No-till or reduced tillage
Grassed Waterways
Vegetated ditches
Field border
Functional riparian system alongside water ways > 10 meters wide
Riparian forest buffer 5-10 meters wide
Retention pond
Water and sediment control basin
Constructed wetland
Irrigation and drainage tailwater recovery
Small Area Applications <0.1A
Hedgerow planting
Cover cropping
Application area has a slope of less than 2%
Sediment basin
Runoff reduction technology

Small group review of live BLT mitigations and note which practices are relevant to them. Each group picked 3 practices to review further and identify:

- **Similarities -** What concepts, components or understandings of the mitigation were shared across the group?
- **Differences -** What concepts, components or understandings of the mitigation differed across the group?
- **Shared Definition:** Each table, work on a shared definition of the 3 mitigations. Meaning for their farm.

2. Introduction to runoff mitigations - Takeaways

Responses have varied however some specific groups continue to voice concern:

- Farmers in arid vs wet regions, flat land, existing practices, precision ag, precision irrigation and chemigation, mitigation that wasn't listed like Pest Management (595), IPM, PAM (450)
- Some practices aren't utilized for various reasons, not a fit for system
- Diverse specialty crop production and small field sizes, turf, grass and vegetable seed, need grower input
- History of conservation planning and practices should count
- Working with a planner or PSP

How do we expand definitions to make mitigations more accessible but still effective?

- Naturally occurring riparian forest buffers or vegetation that farmers are preserving and managing around should be counted
- Where do definitions need to be specific vs. broad to allow for more flexibility and successful implementation?
- Not everyone will be able to get cost-share dollars through NRCS (there are caps, waiting lists)
- How can definitions and options be adaptable

3. Review roles of different stakeholder groups

- Each sector was asked to identify at their table and use sticky notes
  - Agriculture, Regulatory, Conservation, University/Other
  - Their role in ESA pesticide mitigation implementation
  - Questions of and needs from the other sectors
  - SLA Pesticide official spoke and took Q&A

4. Interpreting Bulletins

Read through the example mitigation language.

~5 minutes and draw what it would look like to implement these drift buffers on a field (a hypothetical field or a field you manage).

Cyantraniliprole

Terrestrial Example 1:

For aerial applications using medium to coarse droplet sizes, a 75 foot in-field, wind-directional buffer for windspeeds =<10 mph or a 100 foot in-field, wind-directional buffer for windspeeds 11-15 mph are required.

For aerial applications using coarse to very coarse droplet sizes, a 40 foot in-field, wind-directional buffer for windspeeds =<10 mph or a 50 foot in-field, wind-directional buffer for windspeeds 11-15 mph are required.

The applicator must maintain the appropriate in-field, wind-directional buffer as described above from treatment sites to any area except the following:

1) Roads, paved or gravel surfaces,
2) planted agricultural fields,
3) agricultural fields that that have been prepared for planting, or
4) areas covered by the footprint of a building, shade house, silo, feed crib, or other man-made structure with walls and/or a roof.

In-field, wind directional buffers can be maintained at half the distance required above when windbreaks (e.g., trees or riparian hedgerows) between the application site and all areas except those listed above are present. The windbreak would need to have a row of broad-leaved trees the full length of the treated crop with leaves visible over the entire length, with no significant gaps. The height of the trees or windbreak would need to be at a height greater than the crop to be sprayed.

Malathion – TX plant

Terrestrial Example 2:

In June, July, and September - November, follow one of these measures:

1. Apply X only before dawn or after dusk OR

2. Apply X only when wind is blowing away from areas of native forest and shrubland OR

3. Use a 50-foot ground buffer from native forest and shrubland, and an aerial buffer from these habitats according to application rate:

(1) 50 feet for <0.5 lbs ai/A;

(2) 75 feet for 0.5 - <1 lb ai/A;

(3) 150 feet for 1-2.5 lbs ai/A;

(4) 200 feet for >2.5 lbs ai/A.

Buffer sizes may be reduced by 25 feet for application rates (1) and (2) if a full swath displacement upwind is used during aerial application.

Buffer sizes may be reduced by 50 feet for application rates (3) and (4) if a full swath displacement upwind is used during aerial application.

Habitat: Photos are provided at this link X.

Terrestrial Example 1

Cyantraniliprole

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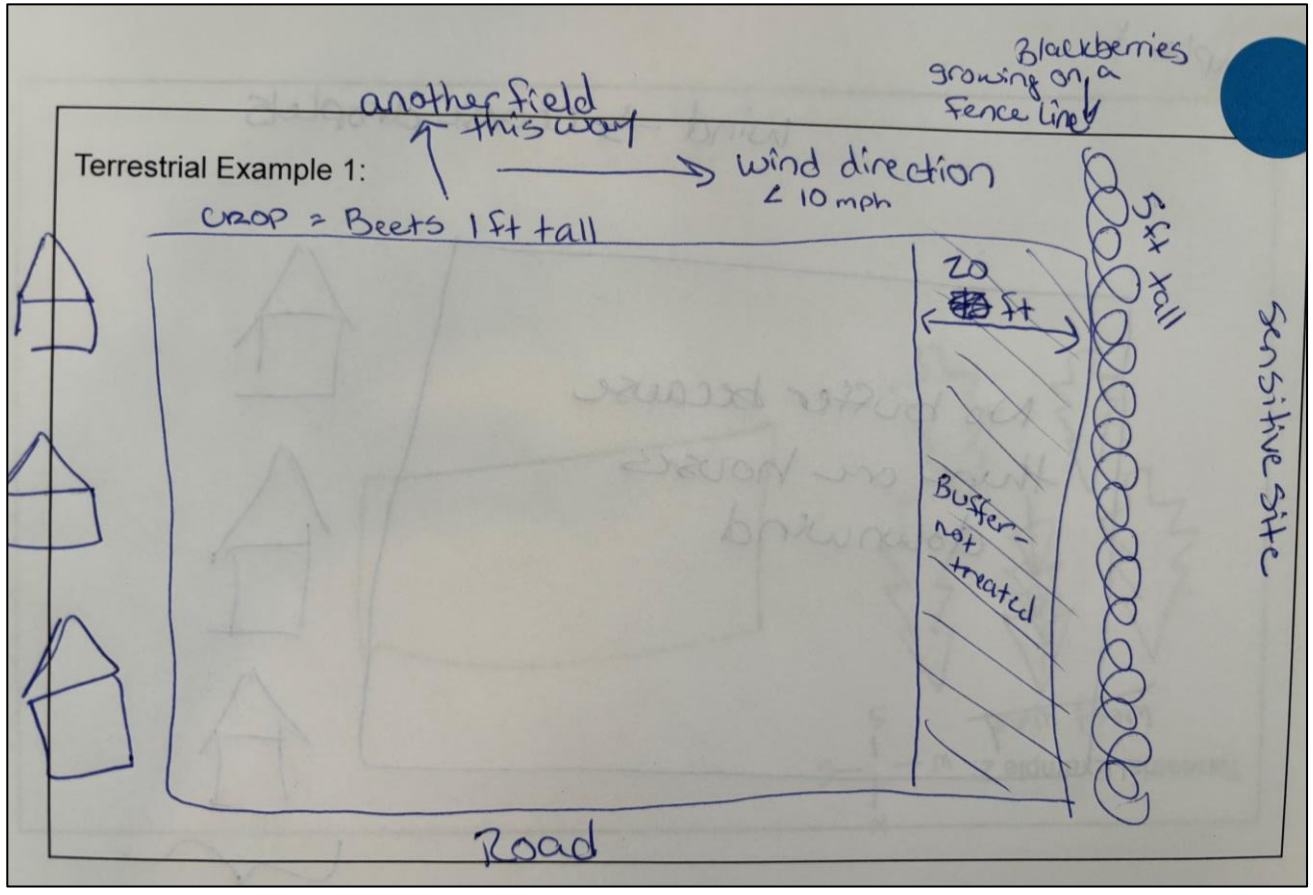

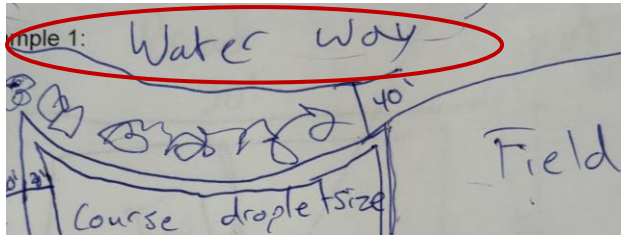

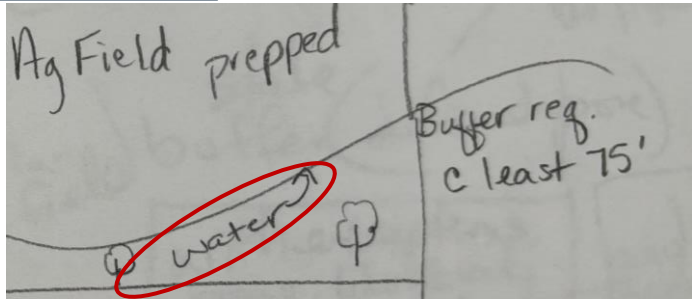

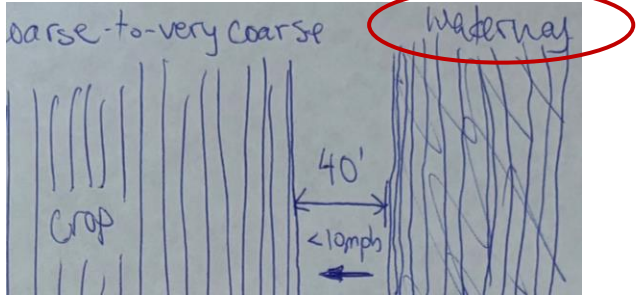

Terrestrial Example 2

Malathion – TX plant

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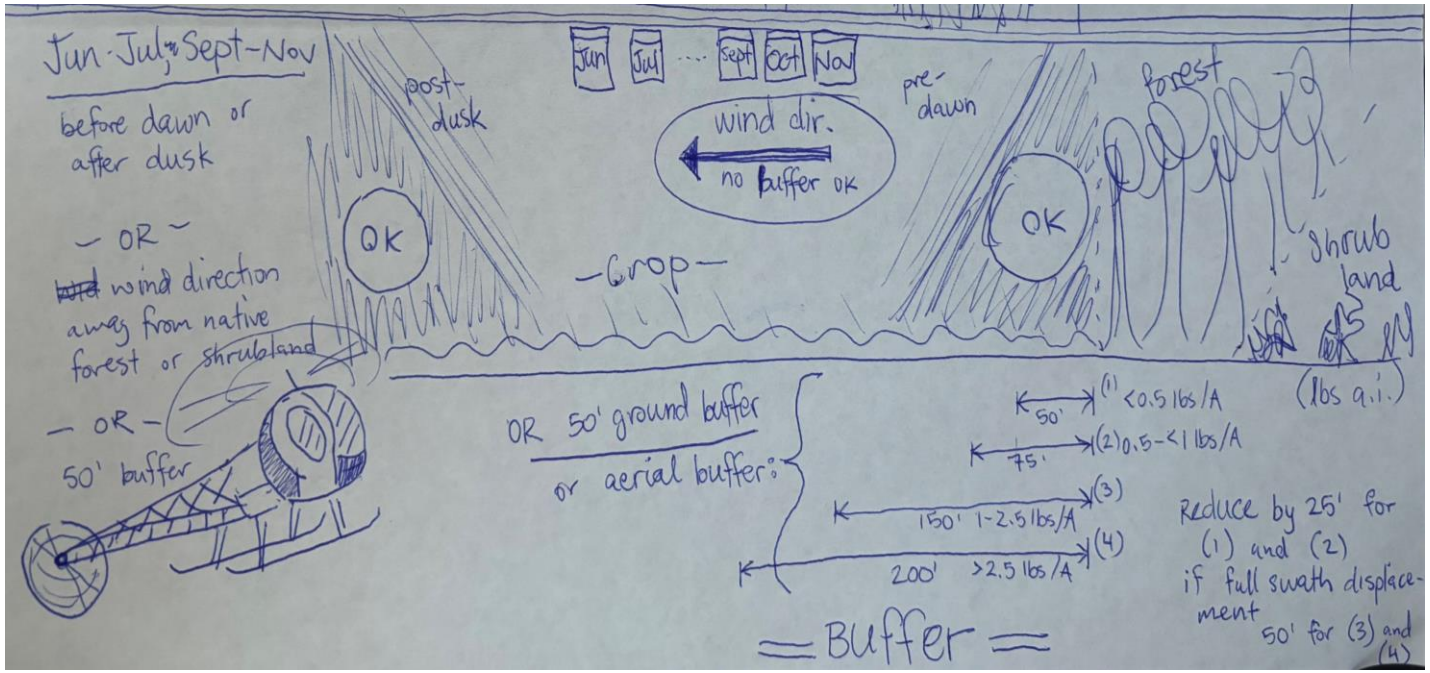
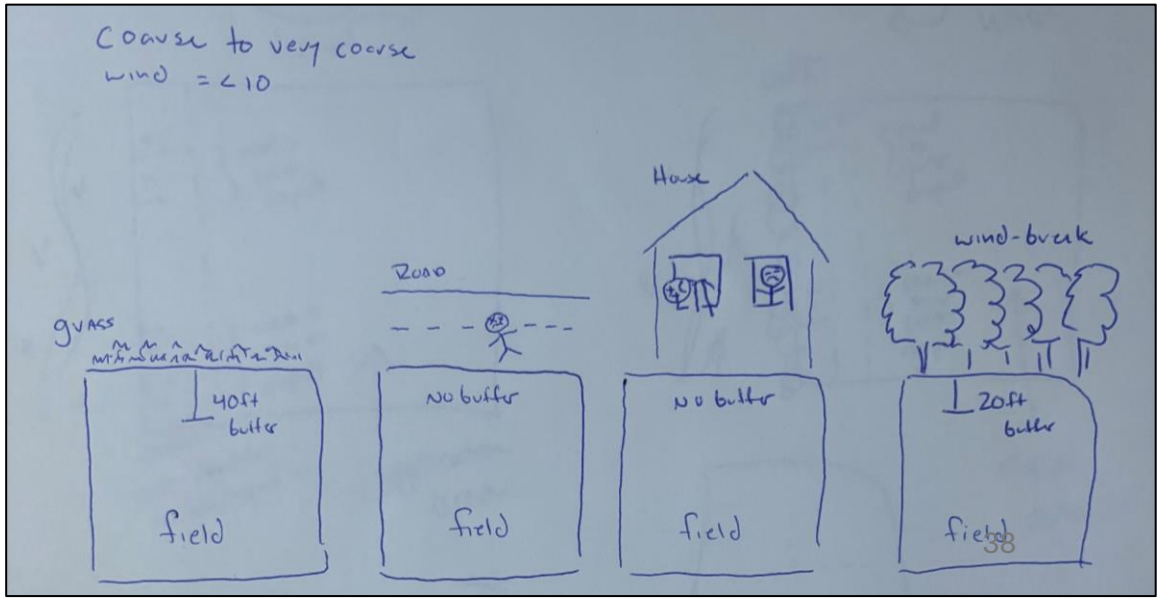


4. Interpreting Terrestrial Bulletins – Takeaways

- In field wind directional buffer language conflicts with other regulations (Worker Protection Standards), fumigation, drift and exposure, etc.
- Contrary to years of training which causes confusion - “why are we now trying to spray closer to houses, schools, roads, etc.”
- Keywords causing confusion: “buffer”, “wind-directional”
- Concern related to applying over 10 mph, wind speed gaps
- Lower rates are a concern
- Risk of human health drift
- Risk of violations
- Risk of complaints
- Broad Leaf Trees only, leaves visible
- Drawings included water setbacks



4. Interpreting Aquatic Bulletins

As a group, take the next 15 minutes to breakdown the bulletin language to identify areas of shared understanding or confusion.

Prometryn

Aquatic Example 1:

When applying X products within 50 meters (164 feet) of salmonid habitat (surface waters accessible to salmon, including, but not limited to lakes, reservoirs, rivers, streams, inundated floodplains, wetlands or natural ponds, estuaries and marine near-shore areas):

For ground applications with rates greater than 1.6 lbs X a.i./acre, implement one of the following risk reduction measures:

1) Do not apply this product within 3 meters (10 ft) of salmonid habitat. For rivers, streams, lakes, and tidally influenced waters, measure from the ordinary high-water mark. For flooded habitats (inundated floodplains e.g. Yolo Bypass), measure from the edge of the inundated area.

2) Presence and maintenance of riparian plantings (e.g., hedgerows) or functional riparian system (e.g., CRP riparian buffers).

3) Vegetative filter strip >= 5 m (15 ft) wide.

4) Vegetated ditches.

5) No-till or reduced tillage.

6) Run-off retention pond.

7) Apply pesticide as a spot treatment (application area < 0.1 Acres).

(For more information on riparian systems, vegetative filter strips, vegetated ditches, no-till/reduced tillage, and retention ponds see pg. 132 of NMFS Biological Opinion: X)

Carbaryl

Aquatic Example 2:

For application rates of X > 2 lb /A: Implement any combination of runoff reduction measures to achieve at least 70 points:

Runoff Mitigations	Points
Vegetated filter strip 3 meter	15
Vegetated filter strip 5 meter	20
Vegetated filter strip 10 meter	45
Vegetated filter strip 20 meter	60
Vegetated filter strip Inter-row	30
Filter Strip Contour buffer strips	30
Strip cropping	30
Contour farming	20
Alley cropping	20
Terrace	15
Mulching with natural materials	30
No-till or reduced tillage	30
Grassed Waterways	30
Vegetated ditches	30
Field border	30
Functional riparian system alongside water ways > 10 meters wide	80
Riparian forest buffer 5-10 meters wide	15
Retention pond	55
Water and sediment control basin	55
Constructed wetland	55
Irrigation and drainage tailwater recovery	55
Small Area Applications	80
Hedgerow planting	15
Cover cropping	5
Application area has a slope of less than 2%	5
Surface roughening	5
Sediment basin	5
Runoff reduction technology, pesticide stewardship program, etc.	TBD

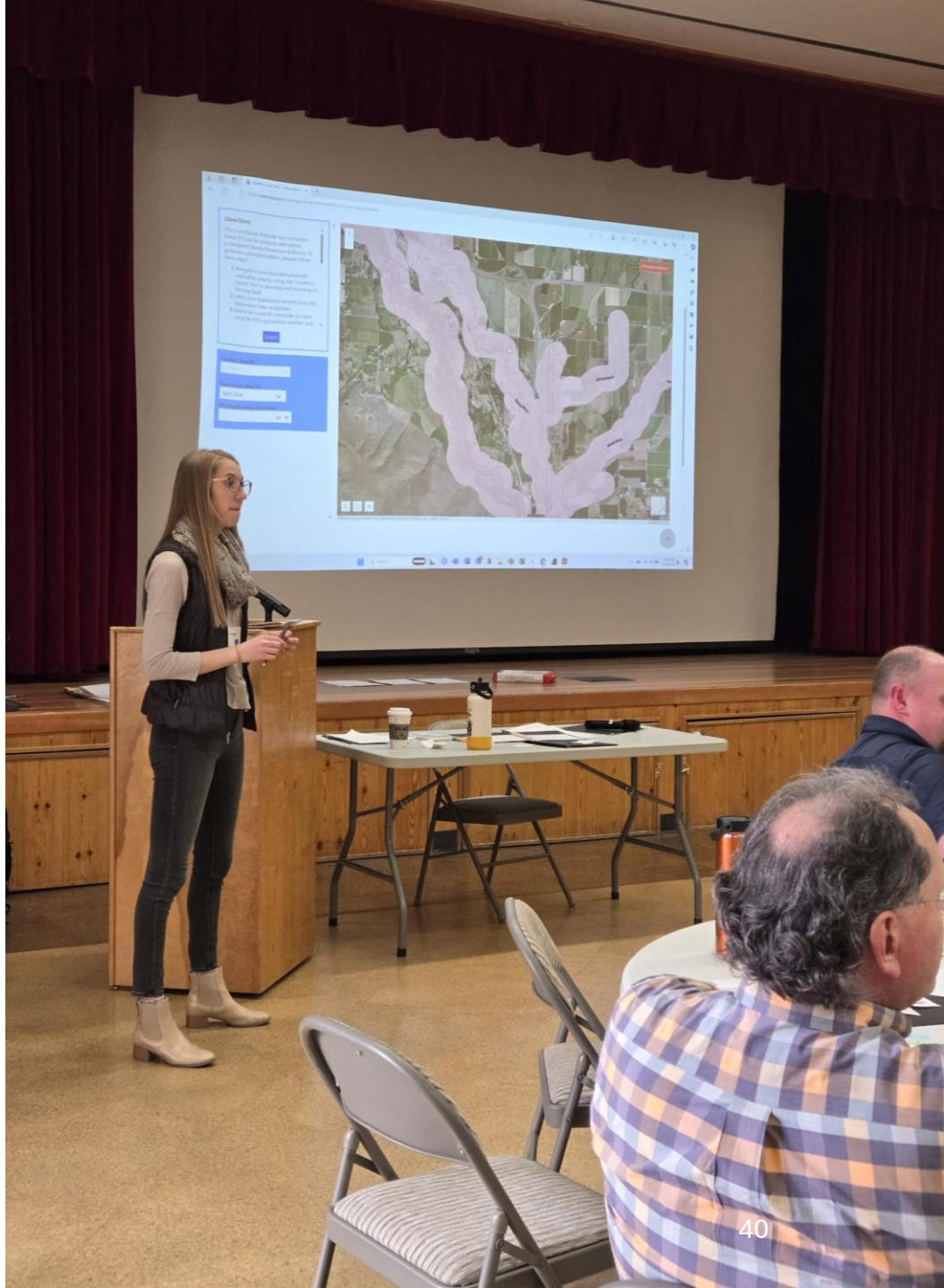
Chlorpyrifos

Aquatic Example 2:

For this mitigation measure, salmonid habitat (referred to below as "fish habitat") is defined as surface waters accessible to salmon, 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 X 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 between 0 to 1 inches requires 80 runoff mitigation points, while a soil incorporation depth >1 to 3 inches requires 50 runoff mitigation points, soil incorporation depth >3 to 7 inches requires 30 runoff mitigation points, and soil incorporation depth >7 inches requires 25 runoff mitigation points.
Each application at a rate >0.5 to 1.5 (lbs a.i./Acre) with a soil incorporation depth between 0 to 1 inches requires 50 runoff mitigation points, while a soil incorporation depth >1 to 3 inches requires 30 runoff mitigation points, soil incorporation depth >3 to 7 inches requires 25 runoff mitigation points, and soil incorporation depth >7 inches requires 20 runoff mitigation points.
Each application at a rate =<0.5 (lbs a.i./Acre) with a soil incorporation depth between 0 to 3 inches requires 25 runoff mitigation points, while a soil incorporation depth >3 to 5 inches requires 20 runoff mitigation points, and soil incorporation depth >5 inches requires 15 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.

4. Interpreting Aquatic Bulletins – Takeaways

- Definitions of conservation practices continue to come up
- Example 1 – “Why would you ever choose option 3 (a 15 ft. vegetative filter strip) when you could choose option 1 (do not apply this product within 10 ft. of salmonid habitat)
- Example 1 – “If I’m using no-till that means I can apply directly up to the water’s edge?”
- Example 2 – Some growers (vegetable seed, many specialty crops, hazelnuts, and arid region growers) indicated they could not reach the necessary points
- Written differently, points and no points
- Lower rates are an issue, soil incorporation
- There are many more mitigations that should be allowed
- Watershed and conservation planning at the local level to assist
- State plan options should exist with locally lead processes
- Oregon and Washington PSP already exists with potential for a State Plan approach by the Pesticide SLA and partners



5. Needs Assessment

Financial Support

Training / Tools

Networks and Coordination

5. Needs Assessment

Financial Support

Other

Conclusions

- The first four workshops were very successful
  - Agriculture groups appreciated the workshops
  - Provided an introduction for agriculture, specialty, and non crop groups
  - Chance for pesticide users to provide input
  - Creates a process to start additional workshops and training
  - Determine roles and needs
- 2 day wrap up workshop May 15-16 Vancouver, Washington
  - Summarize and report on our findings
  - Review roles of interested parties and develop a shared vision of success
  - Plan for next workshops during 2024 – 2025 and seek funding
- Survey went out to all applicators in OR and WA
- Inform SLAs, EPA, NMFS, USFWS, USDA (OPMP, NRCS, ARS, FSA), University, CDs, NGOs, others
- Thank you to USDA NIFA and Western IPM Center, & Dani, Annie, Ryan, and Kathryn

Thank You, Questions

Contact – Gary Bahr

WEB https://agr.wa.gov/
https://agr.wa.gov/departments/pesticides-and-fertilizers
https://agr.wa.gov/departments/land-and-water/natural-resources
https://aapco.org/

EMAIL gbahr@agr.wa.gov

PHONE 360-349-0522

Specialty Crop ESA Mitigation Workshop – Southeastern U.S. Considerations for the Herbicide Strategy

Michael Aerts

Florida Fruit and Vegetable Association

EPA/USDA Herbicide Strategy Workshop

May 9, 2024

Economic Contribution of Ag and Food Industries in Florida

- Florida's agriculture industry grows, raises, and harvests 250 different commodities.
- Ag is present in every single Florida county.
- Florida is known as the nation's winter salad bowl; most of the U.S. East Coast and Eastern Canada depends on Florida farmers for produce during the cold months.
- Florida farmers contribute $156.8 billion to the state's economy each year and support 2 million jobs for Florida families.
- Florida farmers not only provide the food and fiber we need to survive, but they are also the original good stewards of the land and the environment. Farms protect Florida's precious landscape, provide critical wildlife habitat, and allow replenishment of Florida's aquifers.

Florida Ag Production

- #1 U.S. Producer of:
  - Grapefruit
  - Snap Beans
  - Squash
  - Cucumbers
  - Watermelons
  - Tomatoes
  - Bell Peppers
  - Sugarcane
- #2 U.S. Producer of:
  - Oranges
  - Strawberries
  - Tangerines
  - Cabbage
  - Avocadoes
  - Sweet Corn
- #3 U.S. for Honeybee Colonies

Florida Ag Production

- Total area in farms = 9.7 million acres

- 204 acres is the average farm size

Florida Ag Production

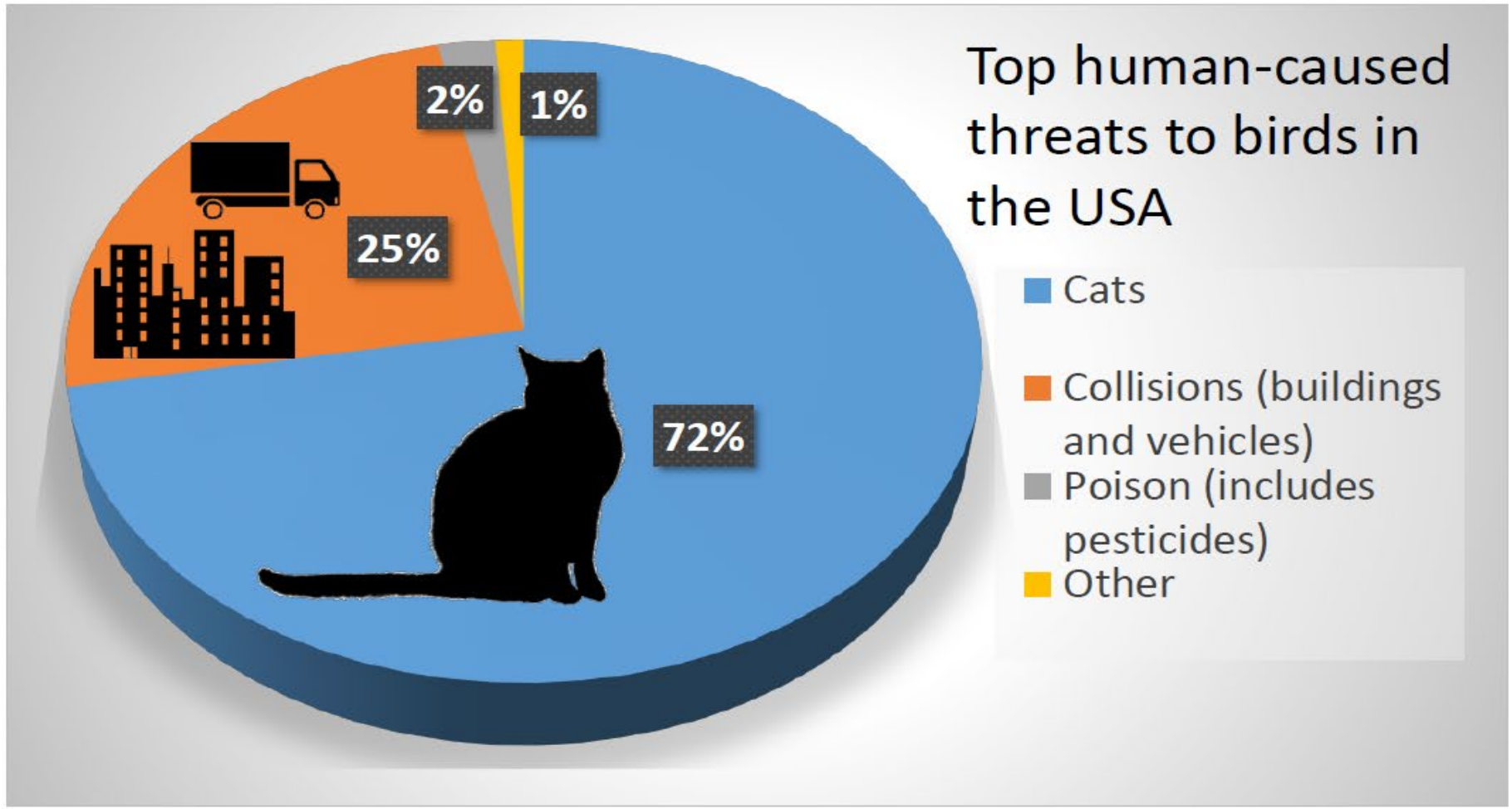
- Wide Variations in Temperature
  - Blazing hot to freezing cold
- Precipitation 50 to 70 inches annually
  - Most rains occur from May through October
  - Impossible to product a crop without irrigation, since we grow from Sept through May
- Humidity
  - Blankets of dense fog and heavy night dews
- Tropical Weather

Florida Ag Production

- Subtropical environment + warm average temperatures + high humidities = INTENSE/CONSTANT WEED, INSECT, NEMATODE, AND DISEASE PRESSURE
- Freezes are few, so pest pressures are not impacted
- Continually confronting invasive and exotic species
- Production costs as high as $18,000 per acre
- Continually dealing with urban development/sprawl

1,669 Endangered and Threatened Species in the U.S.

Context: Birds



Florida Ag Production

- Updated HS Mitigations
  - Directionality improving
  - Specialty crop stakeholders encouraged
  - Flexibility increasing
  - Industry can still assist with any necessary tweaking
  - Affected grower stakeholders want to work on additional refinements

Herbicide Strategy Update …

- Page 1 … “EPA is considering reducing the amount of mitigation that may be needed when growers have already adopted practices to reduce pesticide runoff.”
  - Nutrient runoff stewardship
  - Sediment runoff stewardship
  - Pesticide runoff stewardship
- **Description of Common Practices in Florida and some of the Proposed Mitigations …**


AGROMILLORA

Even When Things Seem Simple, They're Not …

- **Vegetative Ditch Banks for example:**

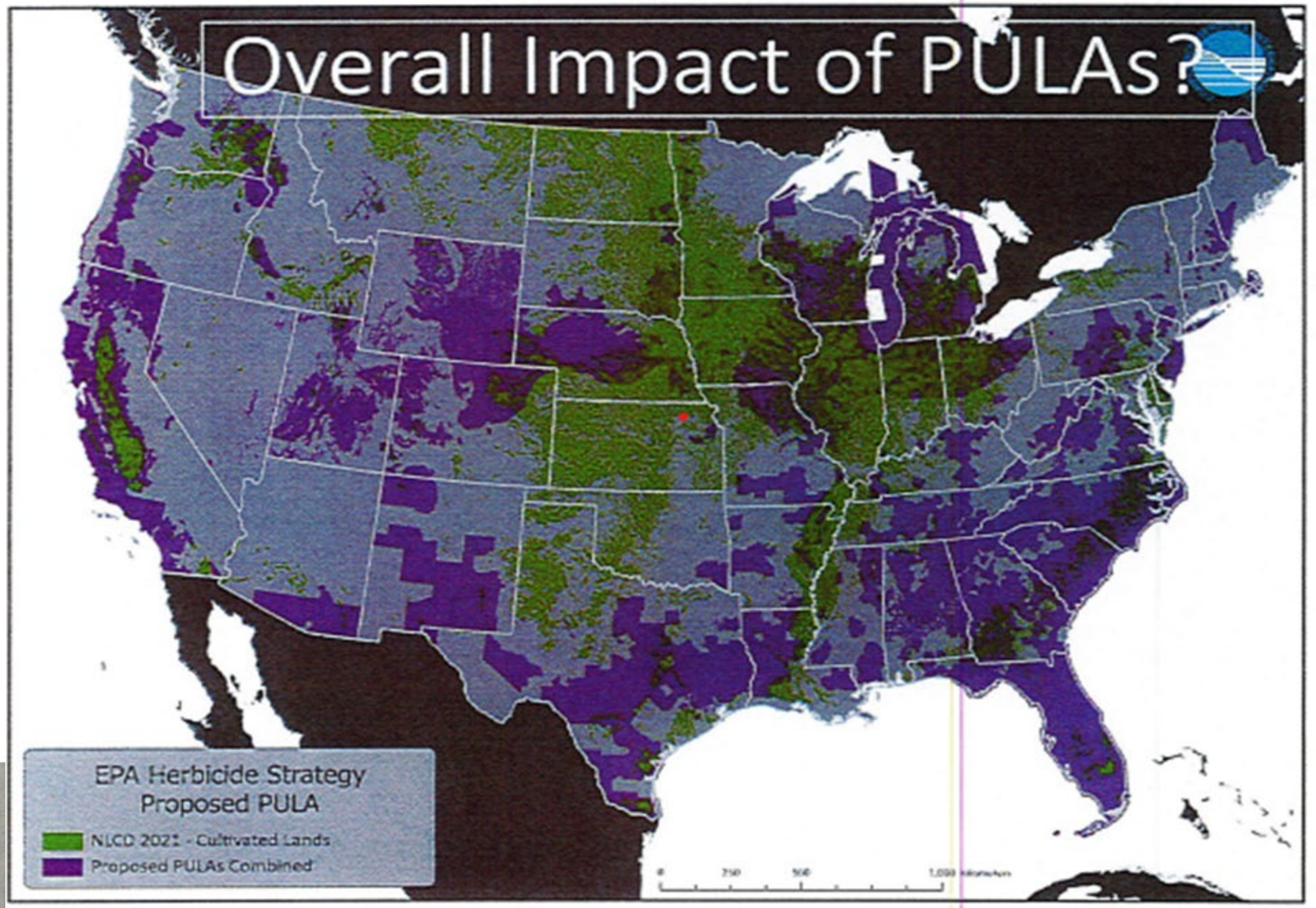

Florette
Canónigos
Fresco. Lavado
13:05

ESA VSPP

PULA for the

LWR Species:

The ESA Herbicide Strategy PULAs:



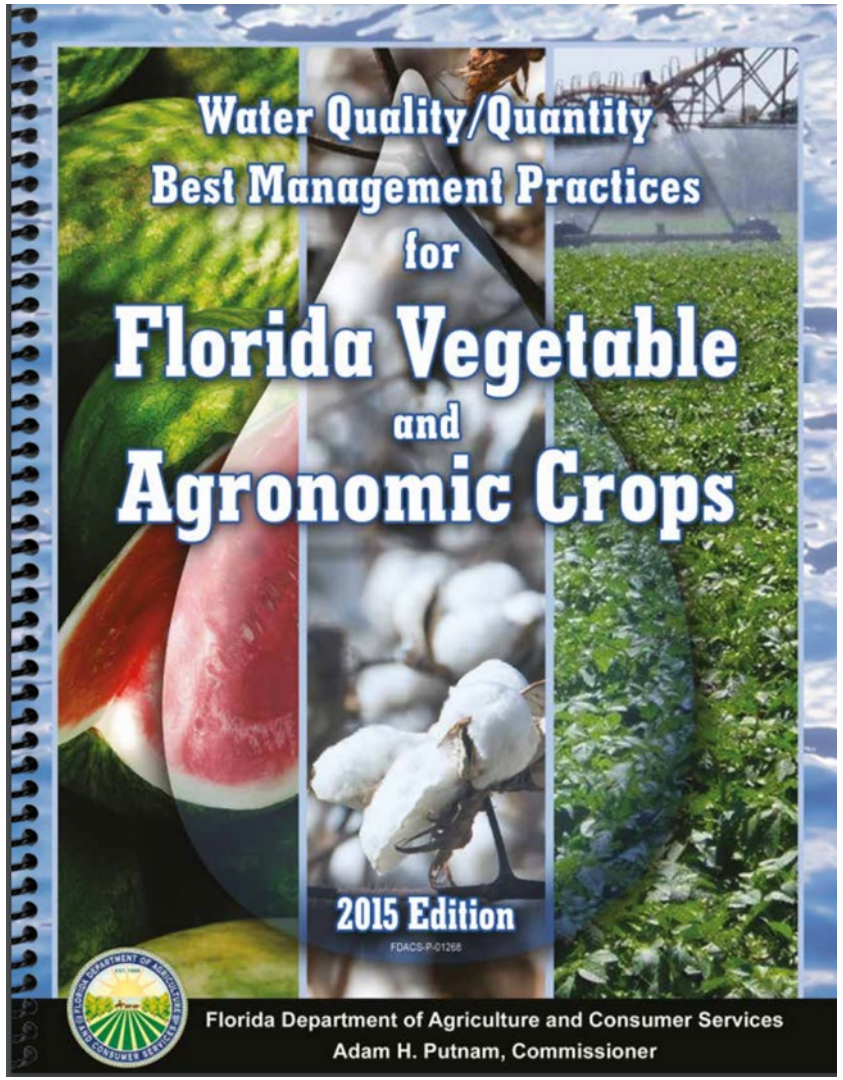
Additional Mitigations Already in Place That Haven't Been Considered Yet …


6400

Additional Mitigation to Potentially Consider –

- FDACS OAWP Best Management Practices Documents
  - Initiated in 2004
  - FDACS works with producers to implement BMPs for nutrient/sediment runoff protections, irrigation management, and protection of water resources
  - Based on research, field-testing, and expert review
  - 77 specific BMP research projects conducted since 2004
  - BMPs in/on grower fields are verified as effective by the FDEP


Water Quality/Quantity
Best Management Practices
for
Florida Citrus
FLORIDA DEPARTMENT OF AGRICULTURE AND
CONSUMER SERVICES
2012 Edition
DACS-P-01756


Water Quality/Quantity
Best Management Practices
for
Florida Vegetable
and
Agronomic Crops
2015 Edition
FDACS-P-01268
Florida Department of Agriculture and Consumer Services
Adam H. Putnam, Commissioner

FFVA

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Florida BMP Enrolment –

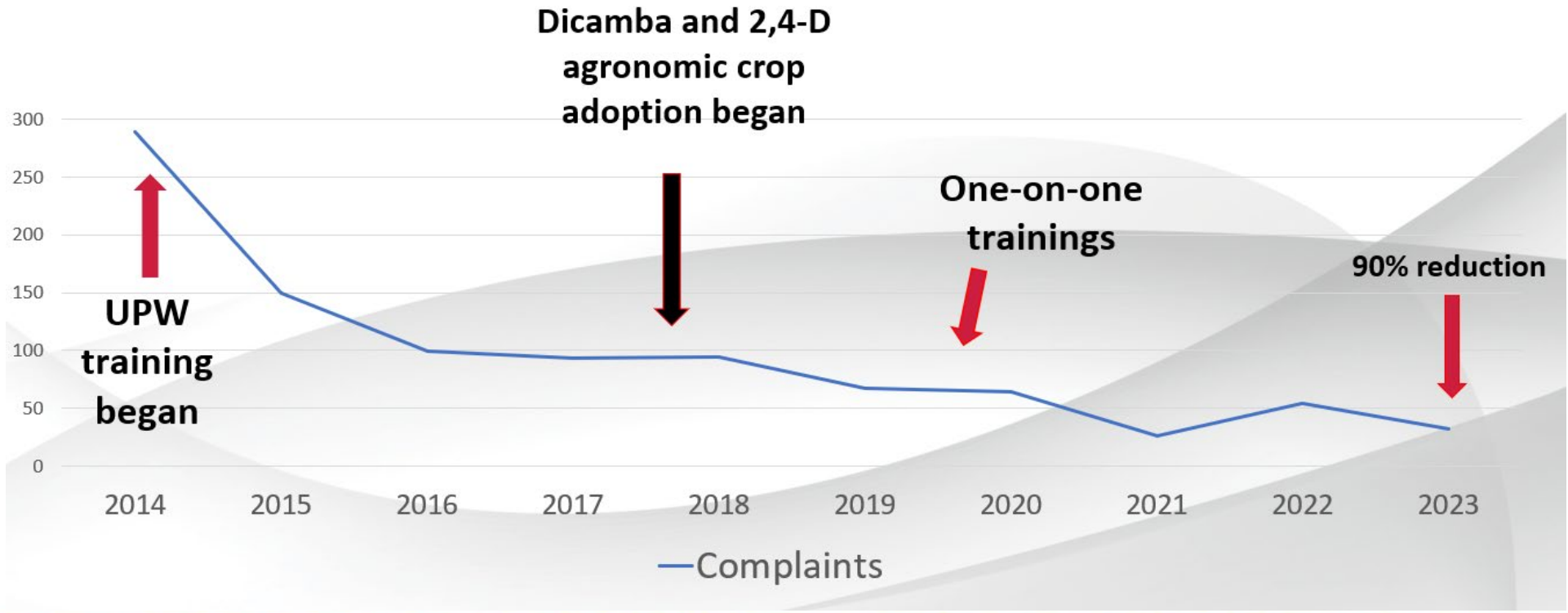
- FDACS OAWP documented that during 2022:
  - 425,000 acres of citrus crops were already enrolled in and following the citrus runoff prevention BMPs
  - More than 1,000,000 acres of vegetable/row/field crops are enrolled
  - Cumulatively, more than 1.8 million specialty crop agricultural acres are enrolled in and adhering to Florida BMP programs

Reducing Pesticide Drift – University of Georgia Using Pesticides Wisely

- Develop data on ways to improve on-target applications
  - Boom height impacts on coverage and drift
  - Droplet sizes
  - Sprayer pressures
  - Drift control agents
  - Wind, humidity, temperature, other climactic influencers
- Share information with growers in ways that can be <u>easily</u> interpreted and adopted

Reducing Pesticide Drift – Using Pesticides Wisely

- UGA Extension Drift Compliant Survey:



Conclusions –

- ESA protections are NOT starting from ground zero in the Southeastern U.S.

- Significant mitigations are already in place
  - Additional mitigations might not even be needed

- We urge EPA to provide acceptance for growers who are already complying with the Florida BMP programs (or similar)

Midwest Considerations for Herbicide Strategy

Laura Campbell, Michigan Farm Bureau

EPA-USDA Herbicide Strategy Workshop, May 9, 2024

MICHIGAN FARM BUREAU®

Farming is crucial for Michigan

1st in the nation for:

- Dry black, red, cranberry beans
- Tart cherries
- Flowers including geraniums, begonias, impatients, chrysanthemums
- Asparagus
- Cucumbers
- Squash

Top 5 in the nation for:

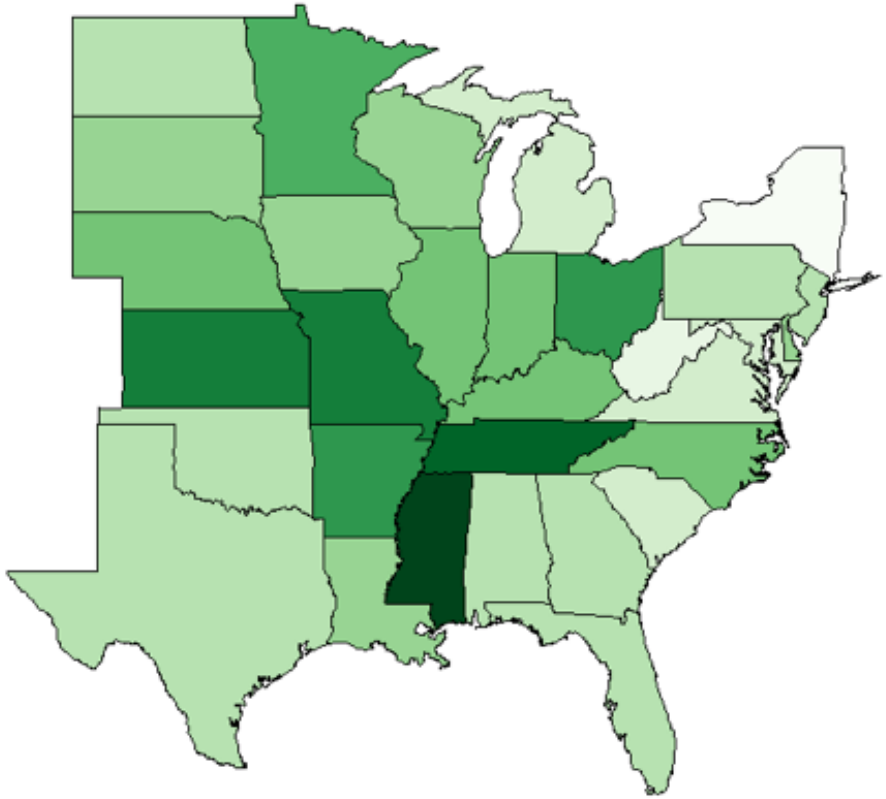
- Apples
- Flowers including Hostas, Easter lilies, pansies, poinsettias
- Snap beans
- Alfalfa haylage
- Sugar beets
- Pumpkins
- Blueberries
- Maple Syrup
- Bell peppers
- Christmas trees

Asparagus harvest, Photo by Michigan Farm Bureau

Farming is crucial for FARMERS

- Michigan’s food and ag system has a $125 billion impact, supporting 800,000 jobs (MSU Product Center)
- 9.4 million acres, 45,000 farms, $12 billion in farm-gate value (USDA Ag Census)
- 95% of farms are family-owned, supporting more than 80,000 farmers who produce food for their communities and the world (USDA Ag Census)

Sorting tomatoes, Photo by Michigan Farm Bureau



Unique Environments Drive Unique Management

- Upper Midwest:
  - Year-round precipitation drives weeds, insects, fungi, disease
  - Movement of weeds, insects, fungi, and pesticide resistance throughout region
  - Specialty crops threatened by climate change-driven pests, diseases, changing seasonal weather patterns, less freezing
  - All farmers must use caution in pest management to avoid conflicts with neighboring farms, residences, natural/sensitive areas

Map of glyphosate-resistant weeds published by Michigan Farm News

Encouraging Steps in Herbicide Strategy

- EPA is moving in the right direction:
  - Adding mitigation practices
  - Refining PULAs
  - Simplifying risk categories
  - Revising runoff risk vulnerability
  - Updating spray drift modeling
  - Identifying low-risk “buffer” areas such as roads, buildings, neighboring crop production
  - Incorporating CRP, vegetated buffers, constructed wetlands into drift management planning

Onions with precision irrigation, Photo by Michigan State University

Recommended Next Steps

- Mitigation practices:
  - Allowing more mulching materials (natural mulches can harbor pests and disease in some environments)
  - Intercropping – vegetables with row crops or cover crops
  - Inter-row vegetation/alleys – vegetation/grasses/cover crops/placing mowing residue between trees/bushes
  - Planting/spraying patterns on slopes to prevent damage to vegetated cover
  - Allow droplet size control via air induction nozzles, spray adjuvants, rate controllers, GPS speed/height monitors
  - Fencing/netting to redirect sensitive species

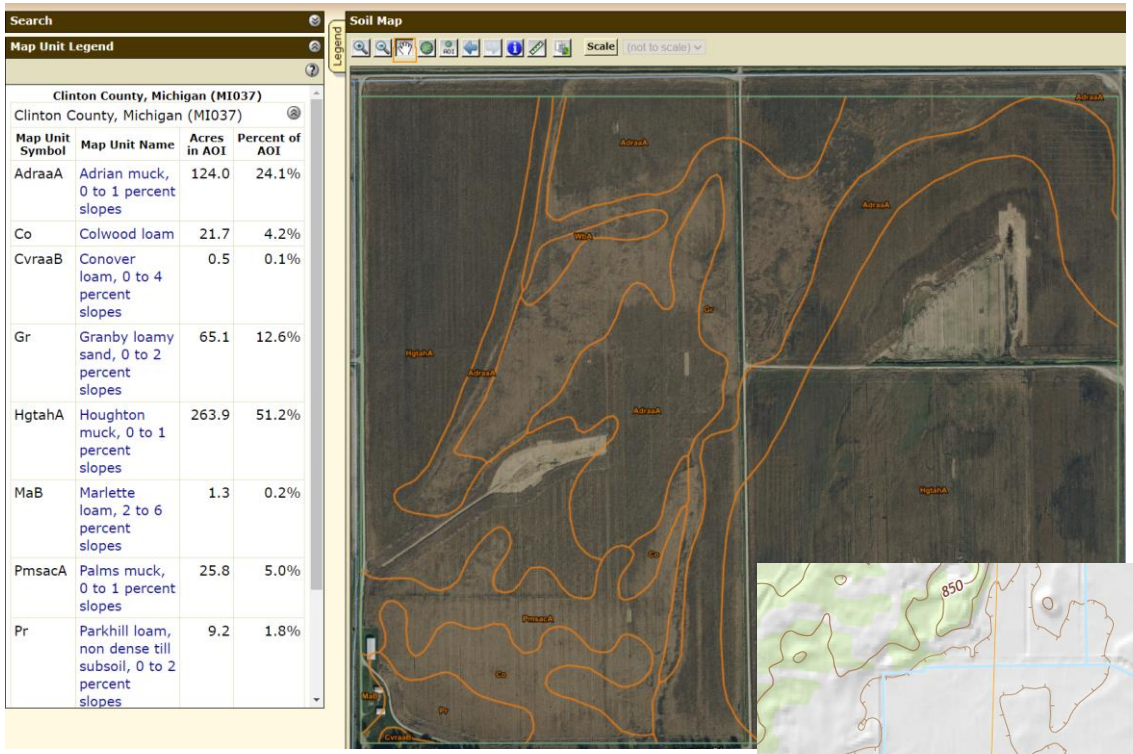
Grass cover between cherry tree rows, Photo by Michigan Farm Bureau

Recommended Next Steps

- Provide training, outreach, clarity on Bulletins Live! Two
- Allow access for farmers with poor or no internet access:
  - Provide contacts and location-specific information to state agencies, university extension, conservation districts, agricultural groups, etc.
  - Allow farmers to sign up for alerts and updates by U.S. Mail

Pumpkin farmer, Photo by Michigan Farm Bureau

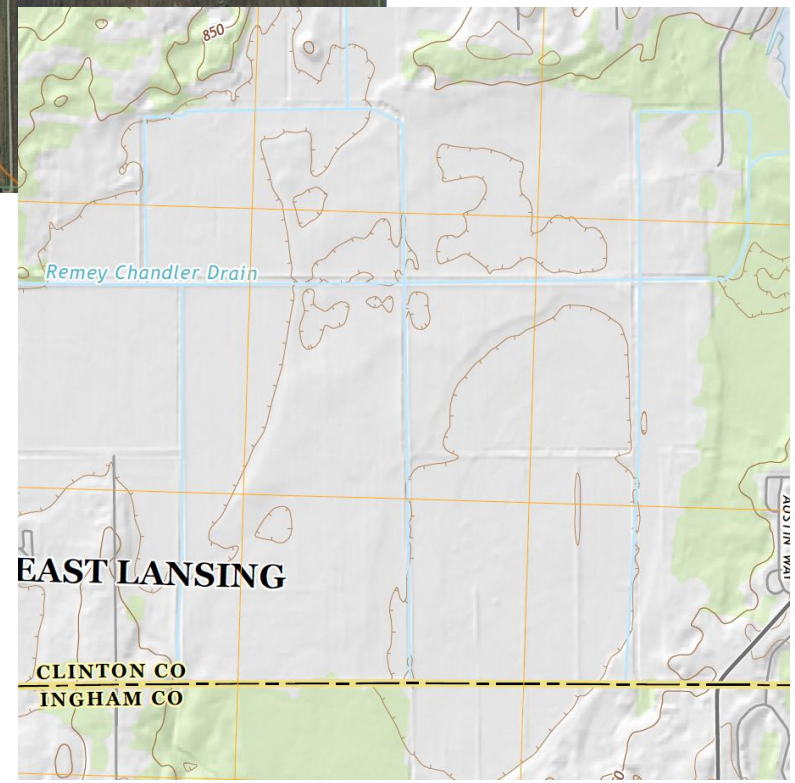
Recommended Next Steps



Clinton County, Michigan (MI037)

Clinton County, Michigan (MI037)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AdraaA	Adrian muck, 0 to 1 percent slopes	124.0	24.1%
Co	Colwood loam	21.7	4.2%
CvraaB	Conover loam, 0 to 4 percent slopes	0.5	0.1%
Gr	Granby loamy sand, 0 to 2 percent slopes	65.1	12.6%
HgtahA	Houghton muck, 0 to 1 percent slopes	263.9	51.2%
MaB	Marlette loam, 2 to 6 percent slopes	1.3	0.2%
PmsacA	Palms muck, 0 to 1 percent slopes	25.8	5.0%
Pr	Parkhill loam, non dense till subsoil, 0 to 2 percent slopes	9.2	1.8%



- Simplify risk/point system to determine practices needed
- Adjust point values for low-risk areas (i.e., low slope, low erosion risk, distant waterways)
- Harmonize erosion risk calculation with analyses farmers use (i.e., RUSLE2, WEPS, USDA Web Soil Survey)
- Refine PULA maps to include slope/soil information to create ONE map with multiple layers for determining risk/restrictions
- Allow farmers to confirm change in point value or points needed at local level with soil test/slope information in addition to mitigation practices

USDA NRCS Web Soil Survey image, and USGS Topographic quadrangle of farm in Clinton County, MI

Graphic by USDA Natural Resources Conservation Service, Michigan

Recommended Next Steps

- Technical and financial assistance
  - NRCS currently turns down ~1/3 of EQIP applications for lack of available funding, no capacity for more demand
  - Farm Bill programs present challenges for some growers to participate in: paperwork, time to repay costs, restrictions/ standards for practices
  - Farmers need more available technical/financial assistance tools

Examples of Practice Implementation Costs

NRCS Practice Costs, Michigan 2023:

- Plan writing: $3,000-$10,000
- Alley cropping: $200-$800/acre
- Conservation cover/vegetated alleys: $200/acre
- Pollinator habitat planting: $700-$900/acre
- Cover crop: $40-$200/acre, plus $100-$1,000/acre termination
- Drip/tape irrigation: $2,500-$5,000/acre
- Mulching: $1,400-$3,000/acre
- Drainage water management structure: $3,000 each (10-20 acres)
- Dike/levee: $22,000 / 1,000 linear feet
- Pond/settling basin: $16,000-$26,000 / 2500 cubic yards
- Windbreak: $700-$2,400 / 1,000 linear feet
- Field border: $100-$500/acre
- Buffer strip: $200-$600/acre
- Forested buffer: $3,000/acre
- Grassed waterway: $5,000-$9,000 / 1,000 linear feet
- Hedgerow planting: $3,000-$4,000 / 1,000 linear feet

Recommended Next Steps

- Training for trusted advisors: state agencies, agronomists, scouts/consultants, retailers, suppliers, University Extension, agricultural groups, conservation districts
- Include exemptions for state/local/regional programs
- Set criteria or method for program managers or participants to apply for program-wide exemption

Checking potatoes, Photo by Michigan Farm Bureau

Program Example: MAEAP

Michigan Agriculture Environmental Assurance Program:

- Confidential and voluntary, funded by fertilizer/pesticide fees
- Work with local technicians on nutrient, water, fuel, chemical, soil health practices
- Personalized planning
- 3rd party verification
- Compliance with regulations and impairment requirements

MAEAP verification sign, Photo by Michigan Farm News

MAEAP Accomplishments

MAEAP verifications through 10/1/2023: 6,666 (3,657 farms)

In the last 5 years: kept ON fields and OUT of waterways:

Sediment: 1.4 million tons

Phosphorus: 2.3 million pounds

Nitrogen: 4.8 million pounds

Added nutrient management plans to 12% of MI farmland in 2019-2023

- What does this mean for the last 5 years? Farmers who have completed MAEAP verification have:
  - Kept enough sediment ON farms and OUT of waterways to fill 300 Olympic-sized swimming pools!
  - Kept as much phosphorus ON farms and OUT of waterways as the weight of 10 blue whales!
  - Kept as much nitrogen ON farms and OUT of waterways as the weight of 350 elephants!
  - Added as much land in nutrient management plans as the entire counties of Monroe and Lenawee, and half of Hillsdale!

MAEAP Helps Farmers with Environmental Goals

- MAEAP Cropping System:
  - Sensitive area identification, setback maintenance
  - Pollinator protection via habitat avoidance, neighbor communication
  - Soil erosion prevention, residue management, cover cropping, concentrated flow management
  - Following pesticide labels, confirming RUP certification
  - Equipment calibration, cleaning
  - Drift management plans, recordkeeping
  - Irrigation/chemigation calibration, drift minimization, backflow prevention, rate management
  - Integrated pest management guidance

Apple orchard with vegetated cover and silt fence between rows,
Photo by Roger Ulmer, Ottawa County, MI

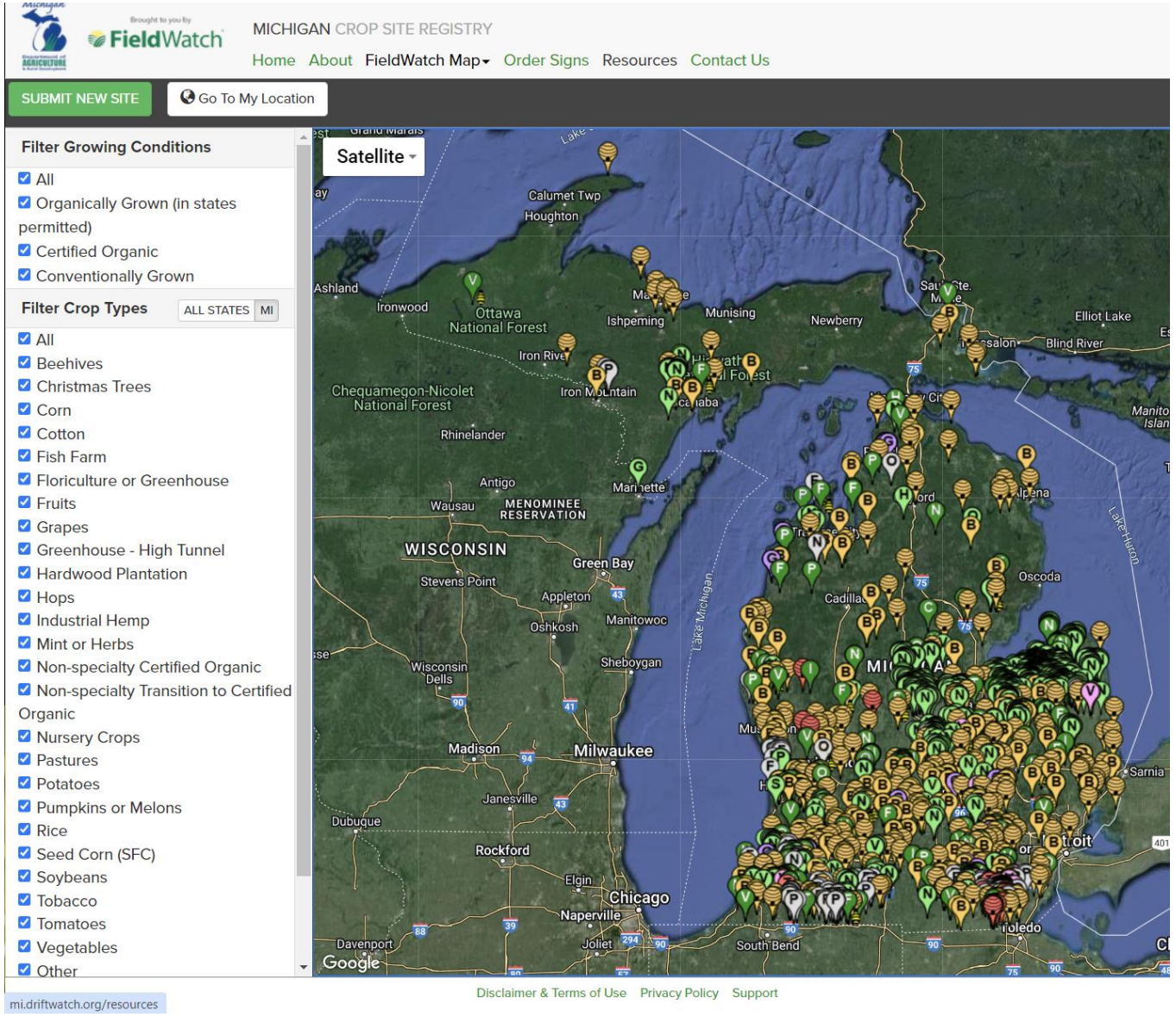
Other Programs and Management Tools

- Generally Accepted Agricultural and Management Practices (GAAMPs) for Pesticide Utilization
  - Guidance for minimizing risk
  - Key to Right to Farm statutory protection, most farmers use it
  - Follows federal/state standards for pesticide compliance
  - Includes application guidance, drift reduction, recordkeeping
  - Integrated pest management

Row cover on kohlrabi, Photo by Michigan State University

Other Programs and Management Tools

- DriftWatch/FieldWatch
  - Voluntary database to monitor pollinator activity, sensitive crops, spray schedules
- EnviroWeather
  - Monitoring of local weather conditions (temperature, wind speed) for application planning
- University Extension education
  - Training on pesticide use, conservation practices offered online, in-person, and via certification



Michigan map of crop and pollination sites by FieldWatch, Inc.

Summing Up

- We appreciate EPA's dialogue and consultation with stakeholders!
- Strategy updates show farmers' concerns are being heard
- Additional actions could help improve clarity and ability to comply
- Farmers want to do the right thing – keeping agriculture involved in this process helps them achieve that goal!

Grape farmer, Photo by Michigan Farm Bureau


Thank you! Questions?

Laura Campbell, Michigan Farm Bureau
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https://www.michfb.com/

MICHIGAN FARM BUREAU®



Specialty Crop Mitigation Workshop

James R Cranney, Jr.
California Citrus Quality Council

May 9, 2024

New Endangered Species Act Policy and Why it Matters to Growers

New Policy

- EPA is proposing to add mandatory mitigation language to pesticide labels

Why it Matters

- Limited mitigation options for tree crops & dry climates
- Potential removal of trees
- High cost of implementation
- Major economic loss for farmers

Types of Mitigation

- Field borders • Strip cropping • Vegetative barriers
- Field terracing/ Contour buffer strips
- Contour farming
- Cover cropping
- No/reduce tillage
- Grassed waterways •Vegetative/grassed ditches
- Riparian buffer zone/ riparian herbaceous zone
- Runoff retention pond/ water and sediment control basin/ sediment catchment basin/ constructed wetland
- Mulching with natural materials
- Alley cropping

Concerns

- Tree crops and vineyards are permanent production systems
- Most mitigations would require removal of trees; yield loss
- Cost of mitigations are significant
- The need for mitigation is not clear to growers
- Significant mitigation is already in place in California

CALIFORNIA Water Boards

State Water Resources Control Board

Mission

“To preserve, enhance, and restore the quality of California’s water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations.”

Regulatory Scope

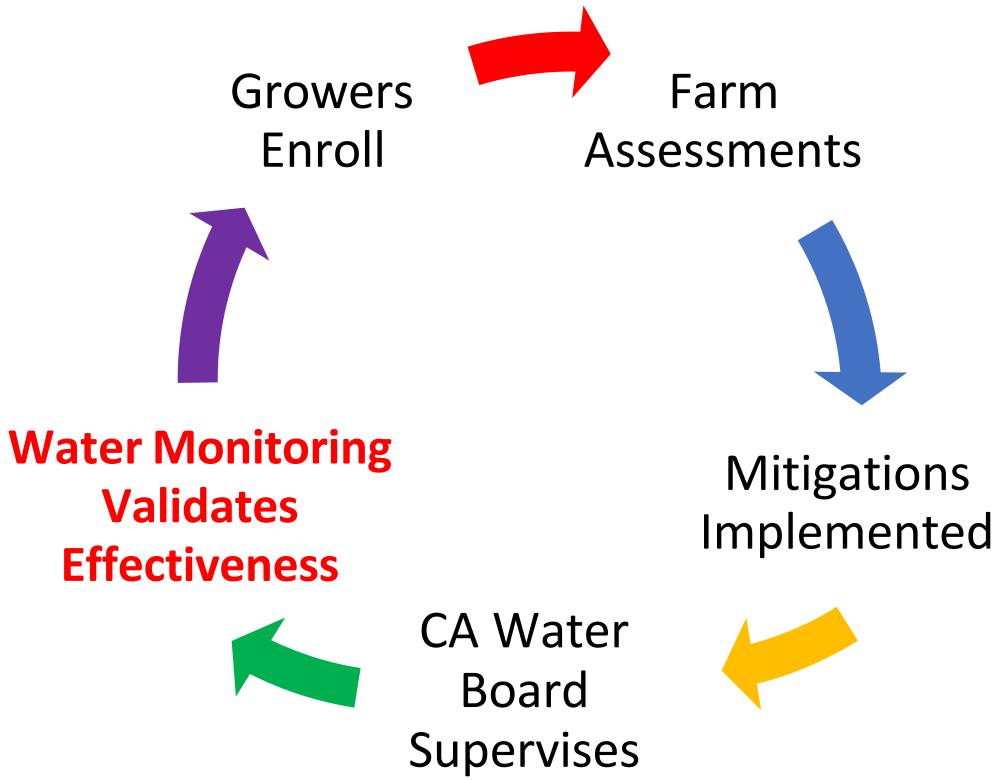
- Biosolids
- Cannabis Cultivation
- Dredge/Fill (401) Wetlands
- Drinking Water Systems
- Irrigated Lands
- Land Disposal (landfills, waste piles, etc.)
- Non-subchapter 15 (WDR)
- National Pollutant Discharge Elimination System (NPDES) (surface water)
- Recycled Water
- Sanitary Sewer Overflows (SSO)
- Storm Water
- Timber Harvest

Irrigated Lands Regulatory Program (ILRP)

- All commercial growers must enroll with river-drainage grower-coalitions; 6 million acres enrolled
- California State Water Board supervises coalitions
- All commercial growers conduct a farm assessment
- Mitigations are required based on the assessment
- Some farms don’t require mitigation; flat or far from sensitive water source
- Grower coalitions conduct environmental testing; provide results to State Water Board
- Adverse detections require investigation; mitigation or fines
- Fines range from $10,000 - $300,000

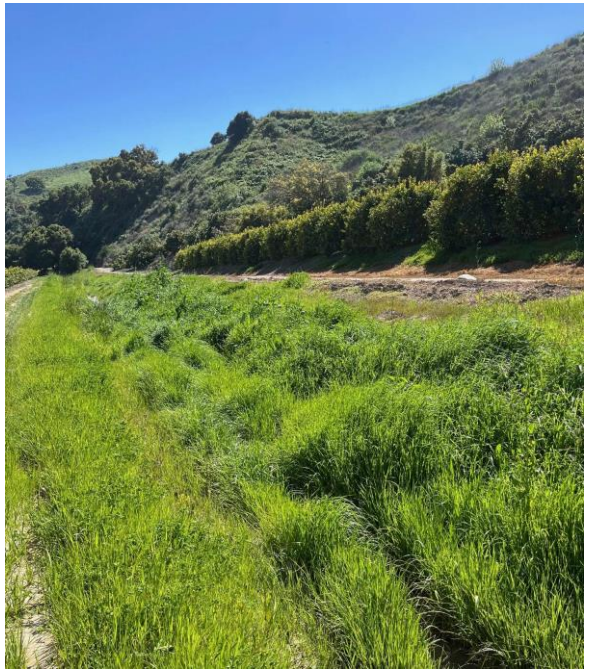
California Citrus Quality Council

How ILRP Works



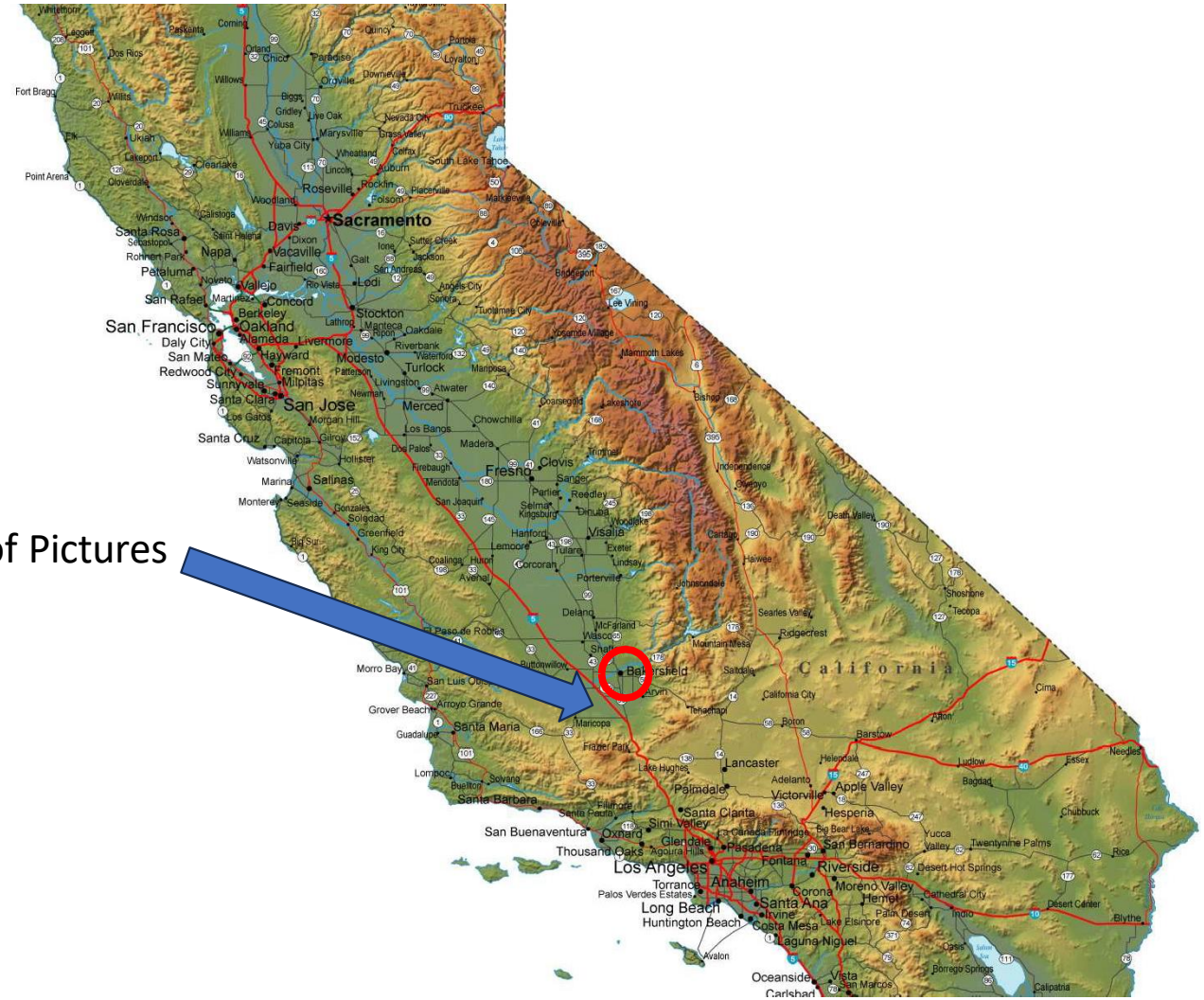
Examples of Mitigations

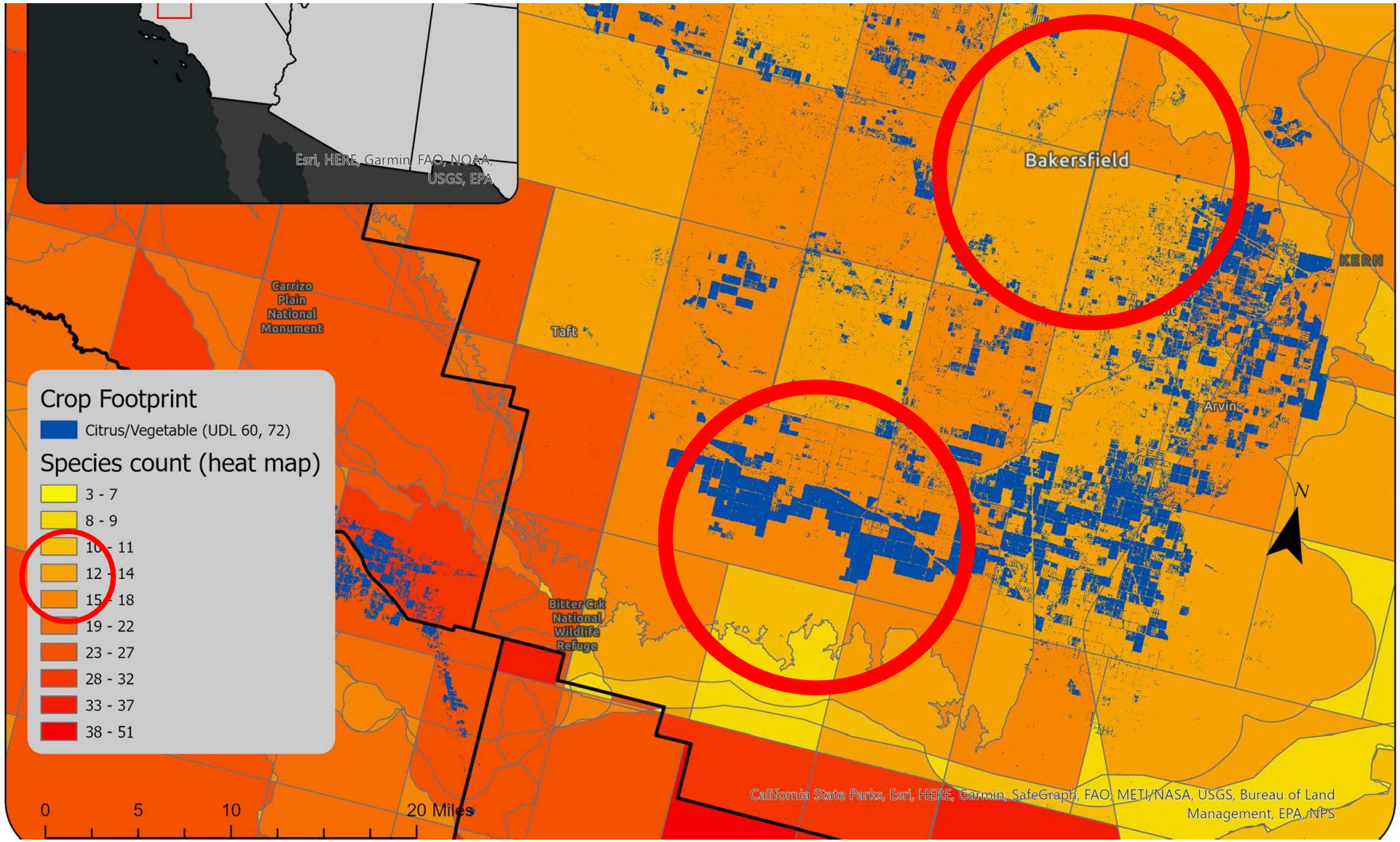
Needed



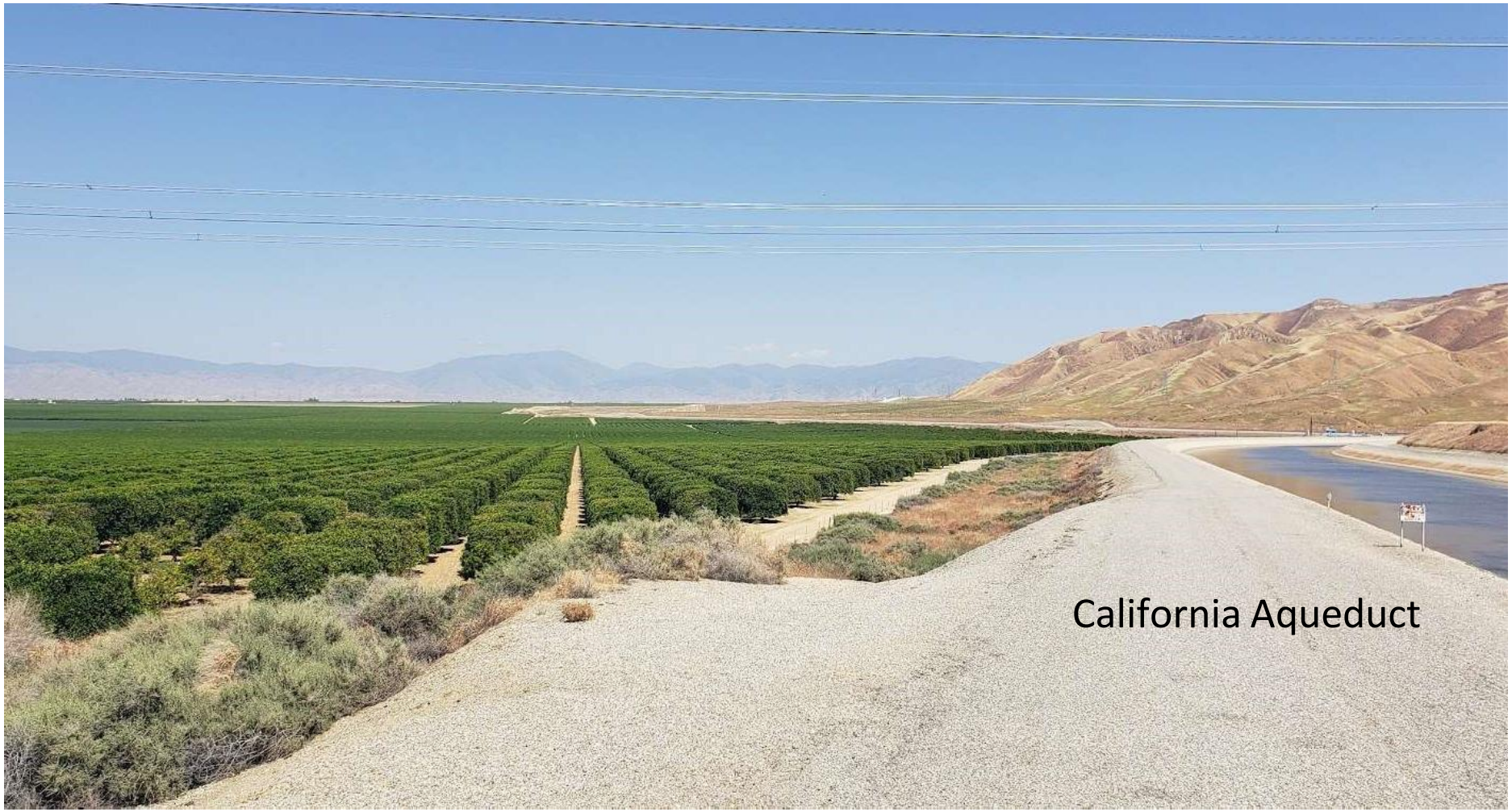
Not Needed

Location of Pictures

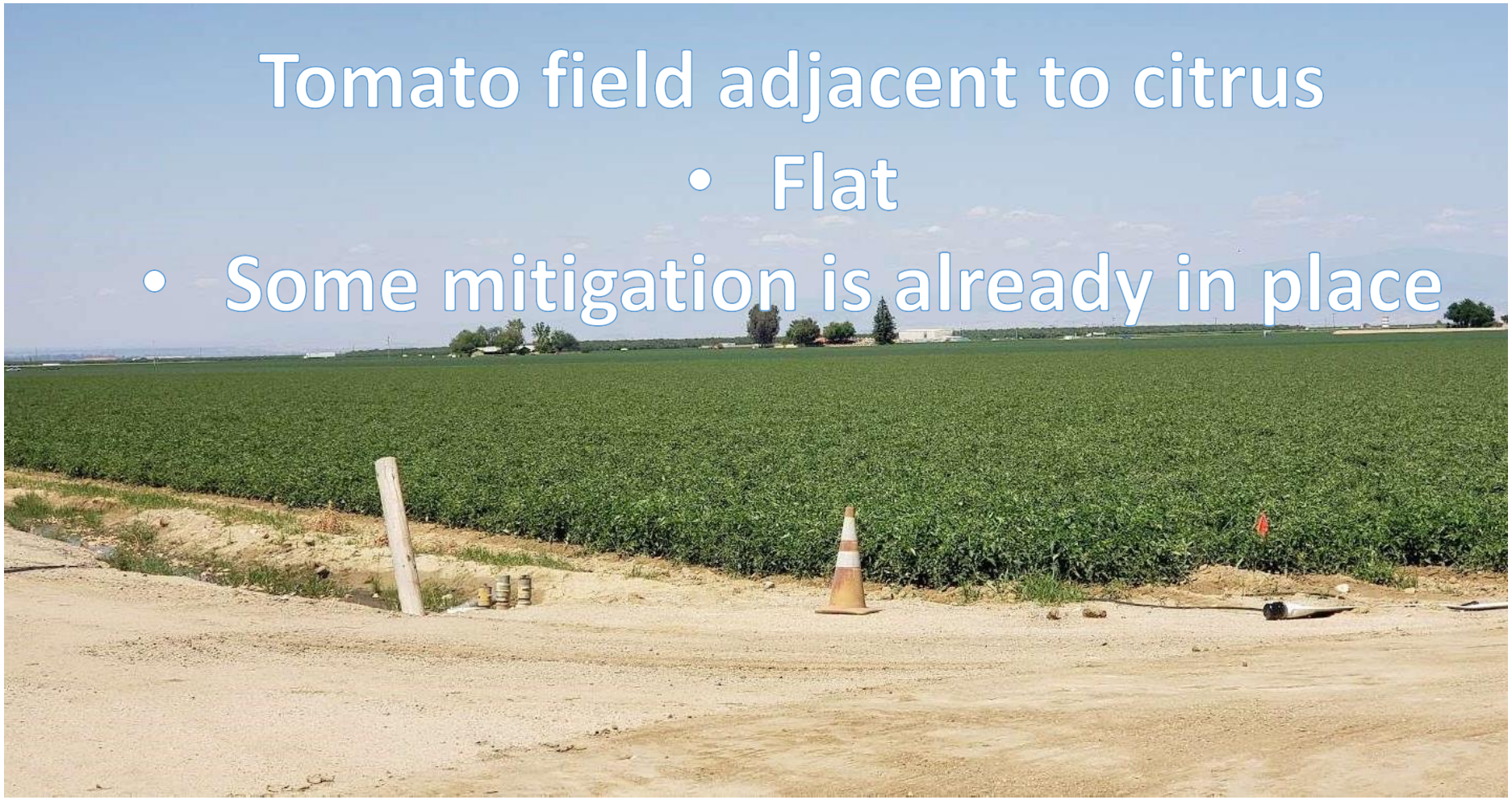



Esri, HERE, Garmin, FAO, NOAA, USGS, EPA
Bakersfield
KERN
Carrizo Plain National Monument
Taft
Arvin
Bitter Crk National Wildlife Refuge
Crop Footprint
Citrus/Vegetable (UDL 60, 72)
Species count (heat map)
3 - 7
8 - 9
10 - 11
12 - 14
15 - 18
19 - 22
23 - 27
28 - 32
33 - 37
38 - 51
N
0
5
10
20 Miles
California State Parks, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, Bureau of Land Management, EPA, NPS


Large portions of California:
• Flat
• Dry during summer
• Permanent vegetation only where there is irrigation


California Aqueduct


Mostly flat
• Mitigations unnecessary?
• Which mitigation?


Tomato field adjacent to citrus
• Flat
• Some mitigation is already in place


• Adding a 30 ft. vegetative buffer would require removal of two rows of trees here
• 30 feet needed for machinery and production activity
30 Feet

Cost to Add 30-foot Vegetative Buffer

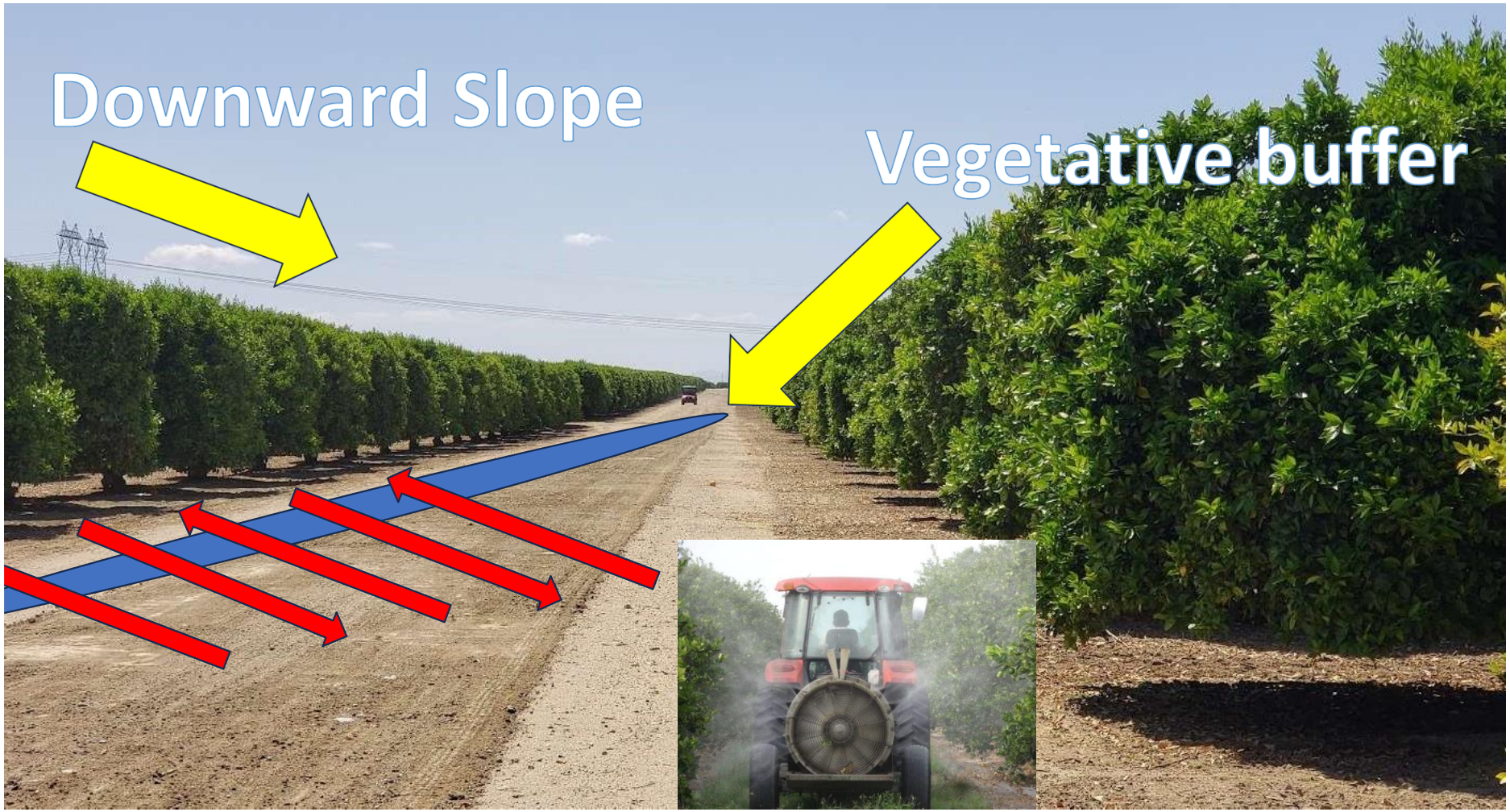
Activity Establishment	Cost per acre	Acres per mile	Times	Cost per Mile
Tree Removal	$2,000.00	5.33	1	$10,660.00
Deep Rip 22"	$44.00	5.33	1	$234.52
Stubble Disk	$30.00	5.33	1	$159.90
Finish Disk	$21.00	5.33	3	$335.79
Irrigation system	$500.00	3.64	1	$1,820.00
				$13,210.21

Cost to Add 30-foot Vegetative Buffer (continued)

Activity Annual	Cost per acre	Acres per mile	Times	Cost per Mile
Annual Irrigation	$1,012.50	3.64	1	$3,685.50
General maintenance	$25.00	3.64	1	$91.00
				$3,776.50

Cost to Add 30-foot Vegetative Buffer (continued)

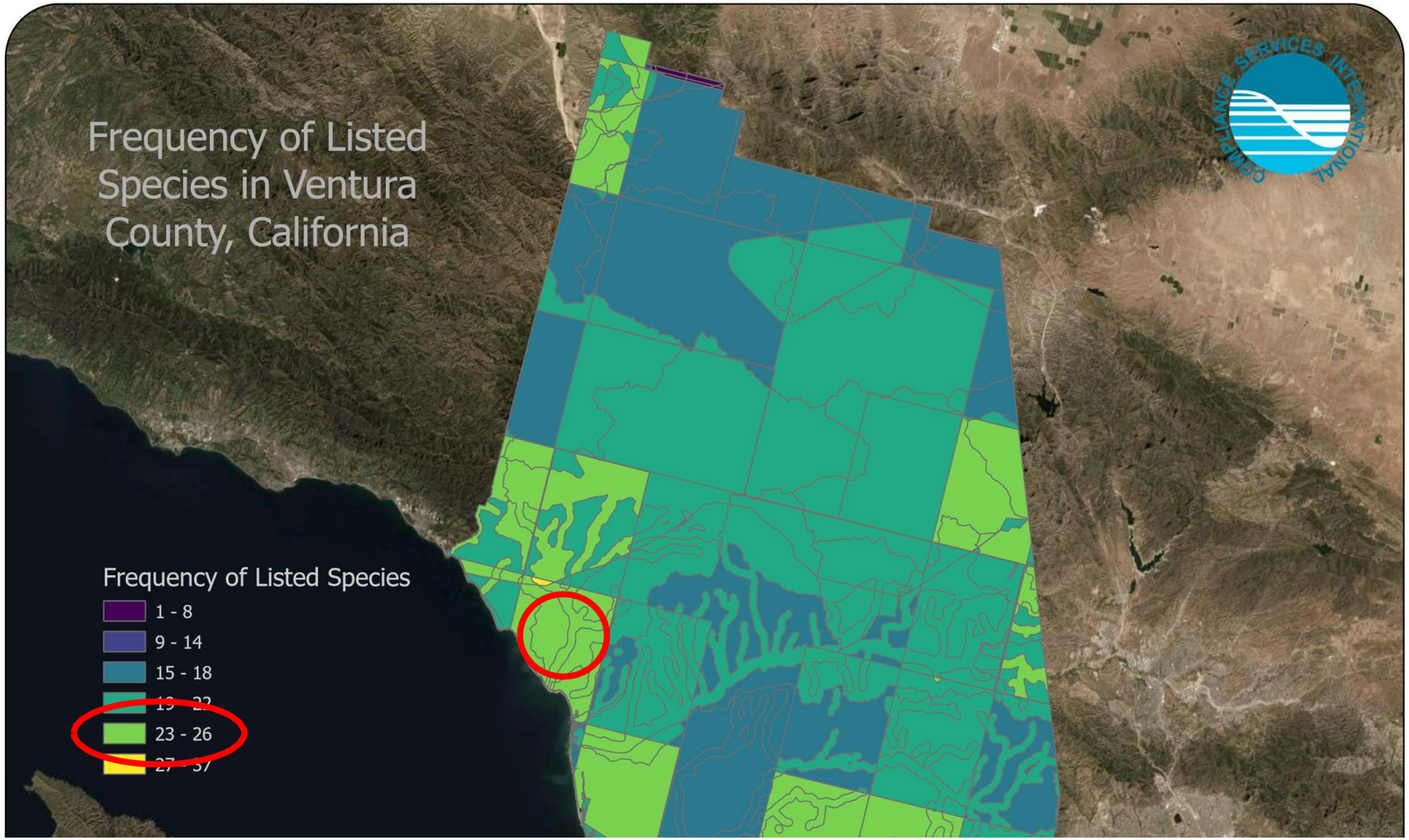
	Per mile	Per 1/2 mile
Establishment Cost	$13,210	$6,605
Annual Cost	$3,777	$1,888
Lost Revenue (tree removal)	$5,330	$2,665
Total	$22,317	$11,158


Downward Slope
Vegetative buffer

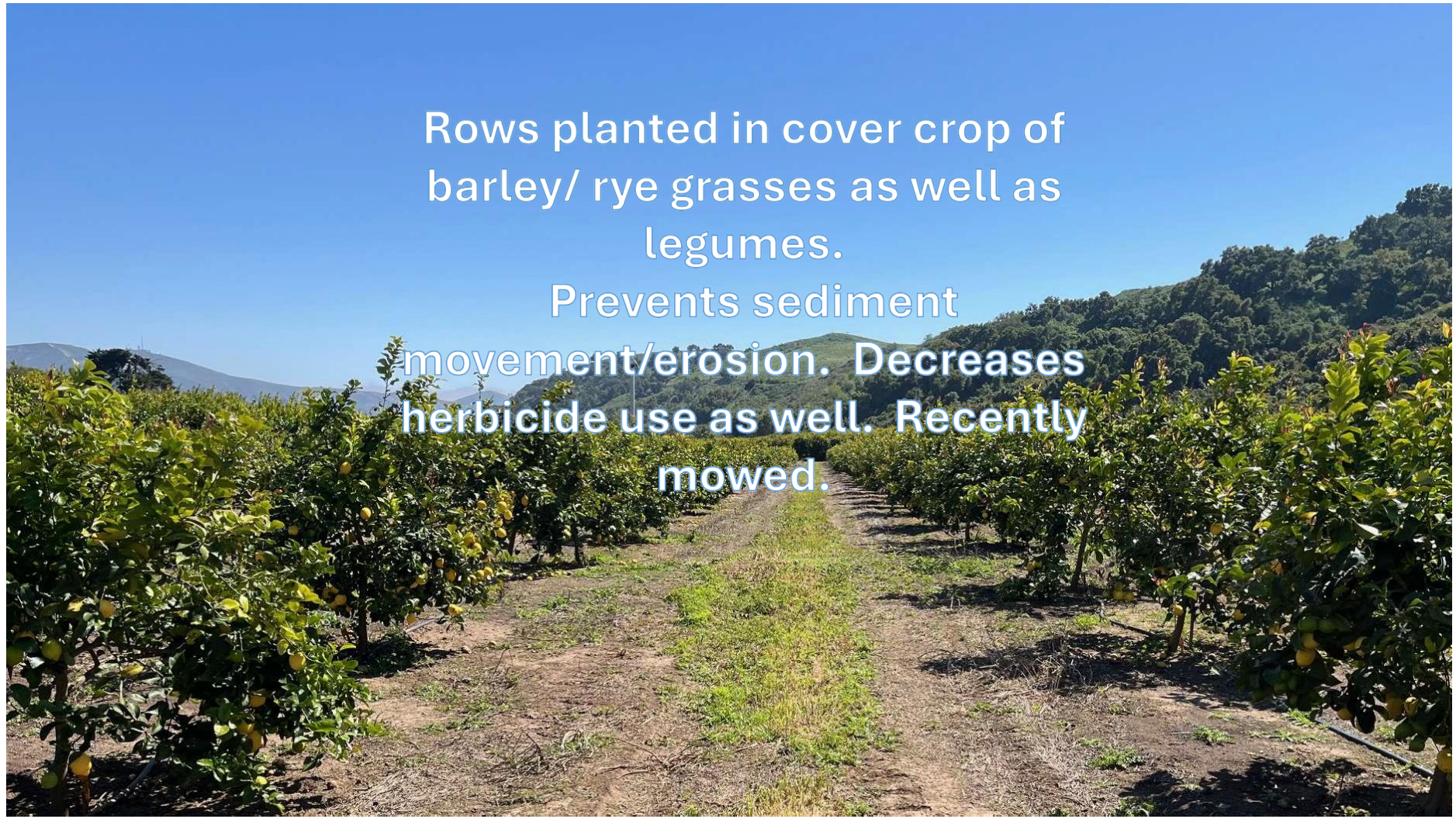

• Tailwater return system
• Water way (no grass)


Tailwater return system

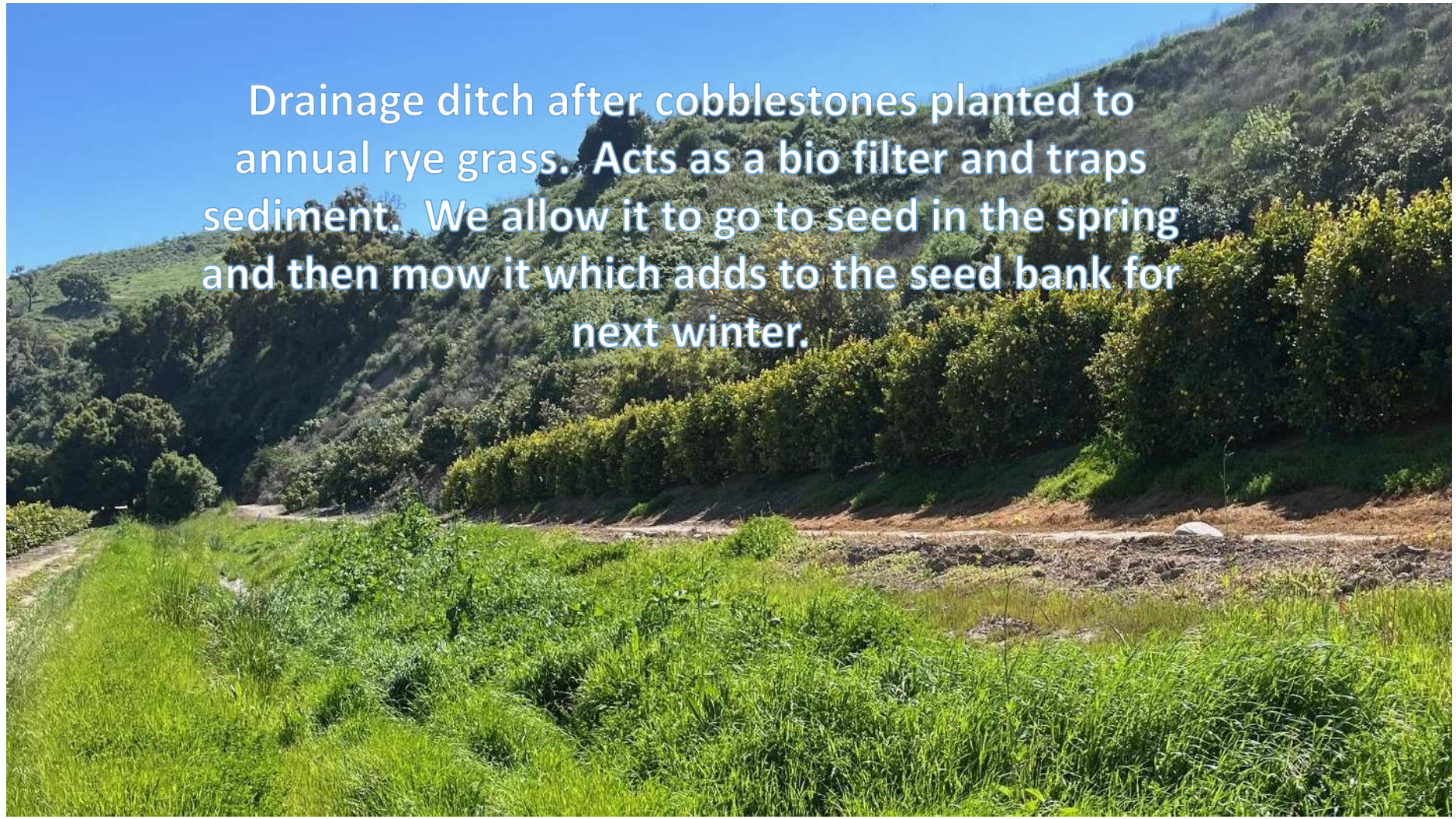
Location of Pictures

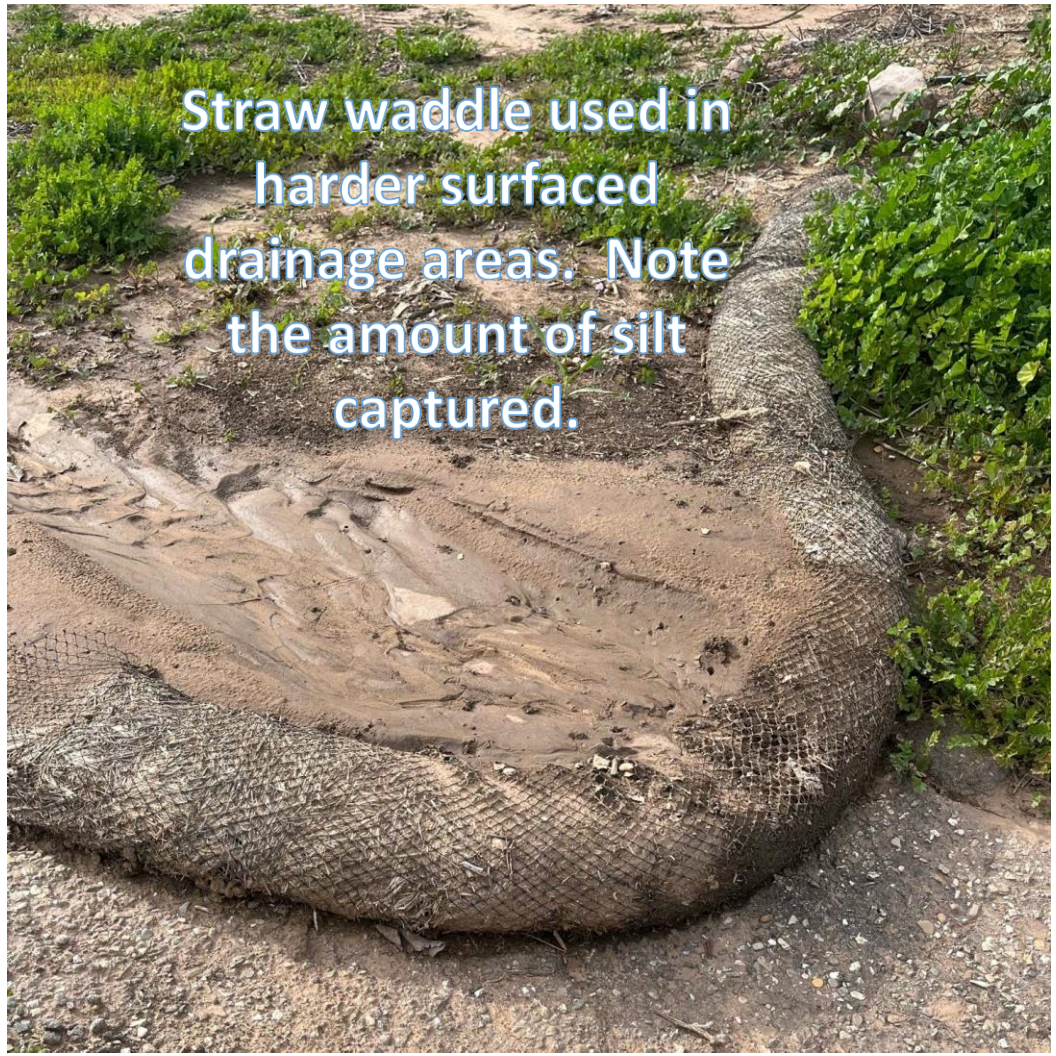

Frequency of Listed Species in Ventura County, California
Frequency of Listed Species
1 - 8
9 - 14
15 - 18
23 - 26


Rows planted in cover crop of barley/ rye grasses as well as legumes. Prevents sediment movement/erosion. Decreases herbicide use as well. Recently mowed.


Rows planted in cover crop of barley/ rye grasses as well as legumes.
Prevents sediment movement/erosion. Decreases herbicide use as well. Recently mowed.


Cobblestone to prevent erosion and slow down water allowing sediment to fall out.


Drainage ditch after cobblestones planted to annual rye grass. Acts as a bio filter and traps sediment. We allow it to go to seed in the spring and then mow it which adds to the seed bank for next winter.


Straw waddle used in harder surfaced drainage areas. Note the amount of silt captured.


Large retention basin with more vegetation to act as a filter. Sediment is trapped and clear water flows through.


This retention basin was 4 feet deeper in the fall. We caught 4 feet of silt while allowing water to flow out after the silt drops out. Will clean out basin late summer using the trapped sediment on the farm.

Cost of Constructing Retention Basin

- Estimated cost for one basin = $ 20,000
- This grower uses 4 retention basins for 160 acres of citrus
- Total cost = $80,000


Steep hillside. Avocado orchard removed. Seeded with legume and grass mix by helicopter to provide erosion control and prevent sediment movement. Will mow when seeds are ready.

Special Cost Example

Herbicide Strategy – *"Trying to get points"*

- Soil incorporation after application (2 points)
- $20-$30 per acre; 2 applications per year
- 30-acre farm (small grower) - $1,200 - $1,800 per year
- 300-acre farm (medium grower) - $12,000 - $18,000 per year

California Citrus Quality Council

Conclusion

ESA protection is not starting from ground zero in California

Significant mitigations are already in place or not needed

Urge EPA to provide exemptions to growers who are already complying with the ILRP program

Questions

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(ESA Overlay Slides)

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