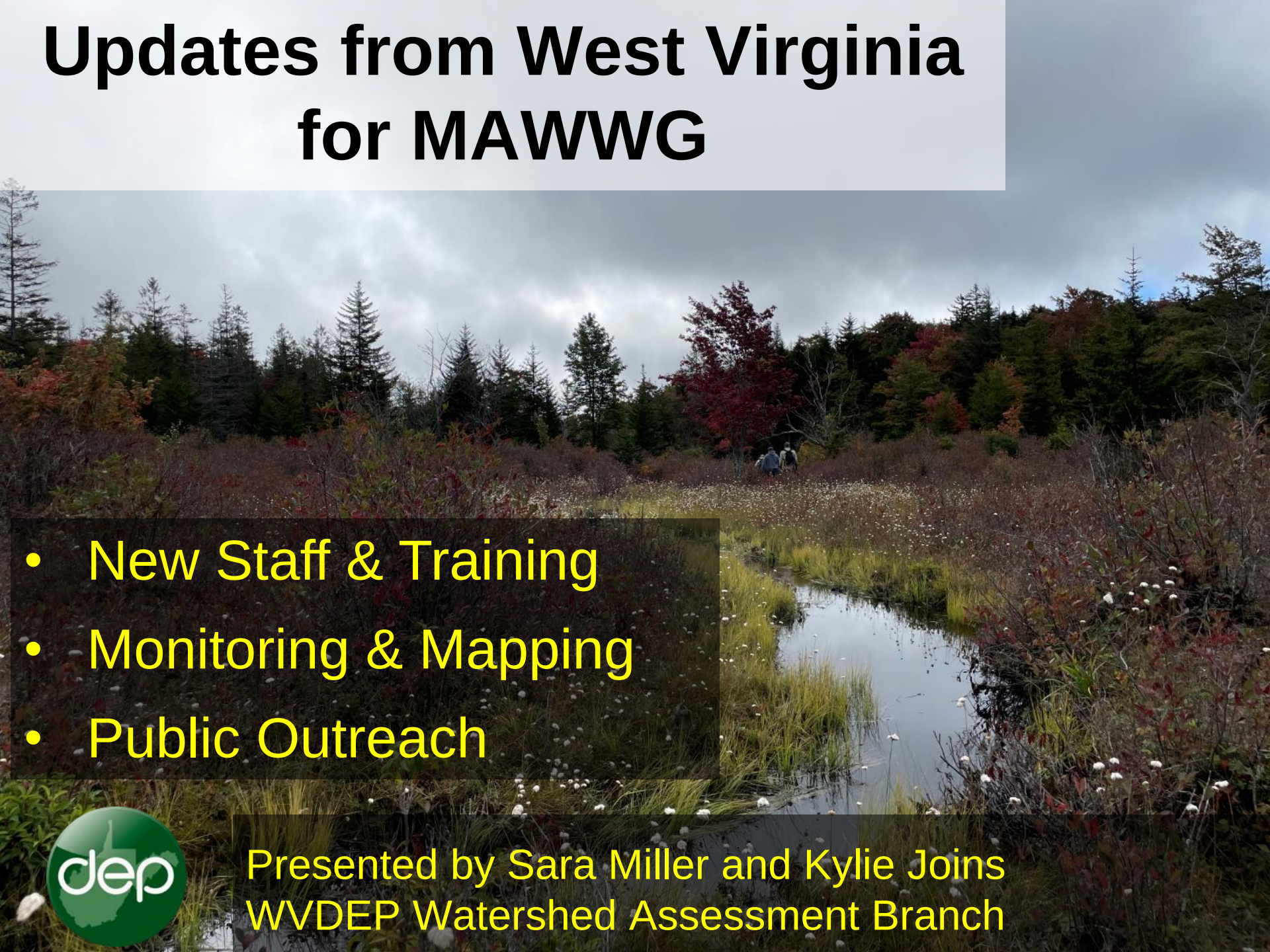
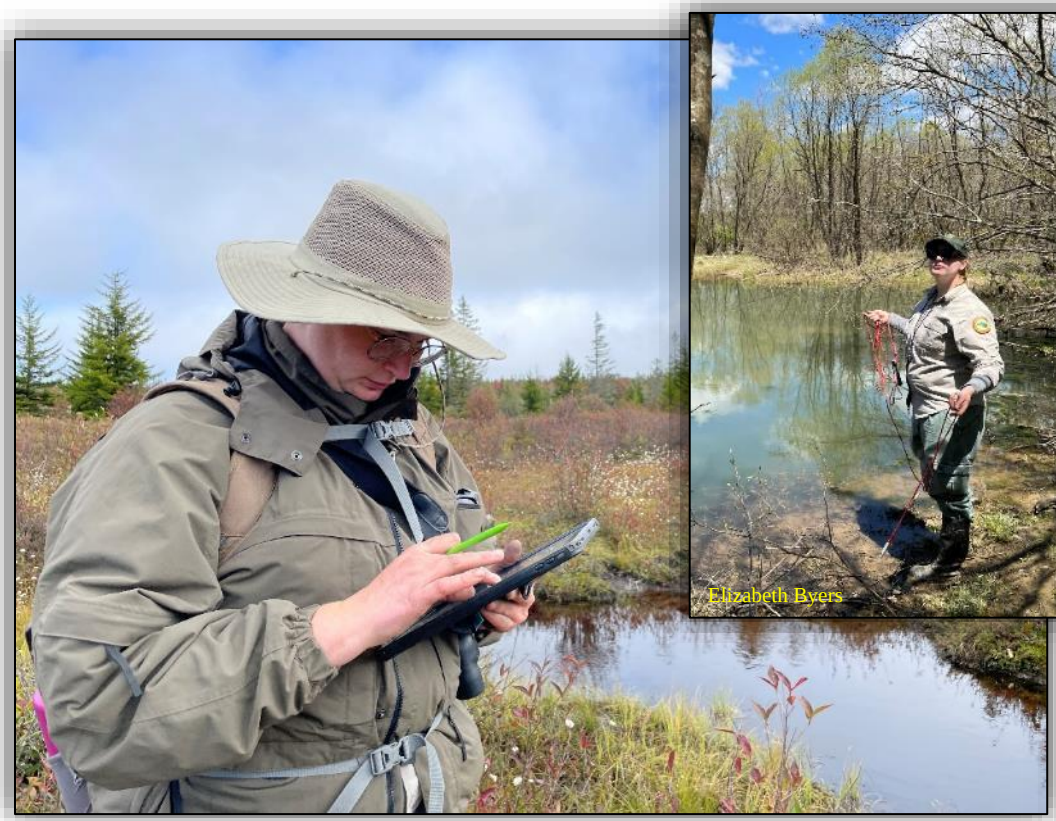
Updates from West Virginia for MAWWG



- New Staff & Training
- Monitoring & Mapping
- Public Outreach

Presented by Sara Miller and Kylie Joins
WVDEP Watershed Assessment Branch

New Staff (please welcome Kylie Joins!)



Staff Training

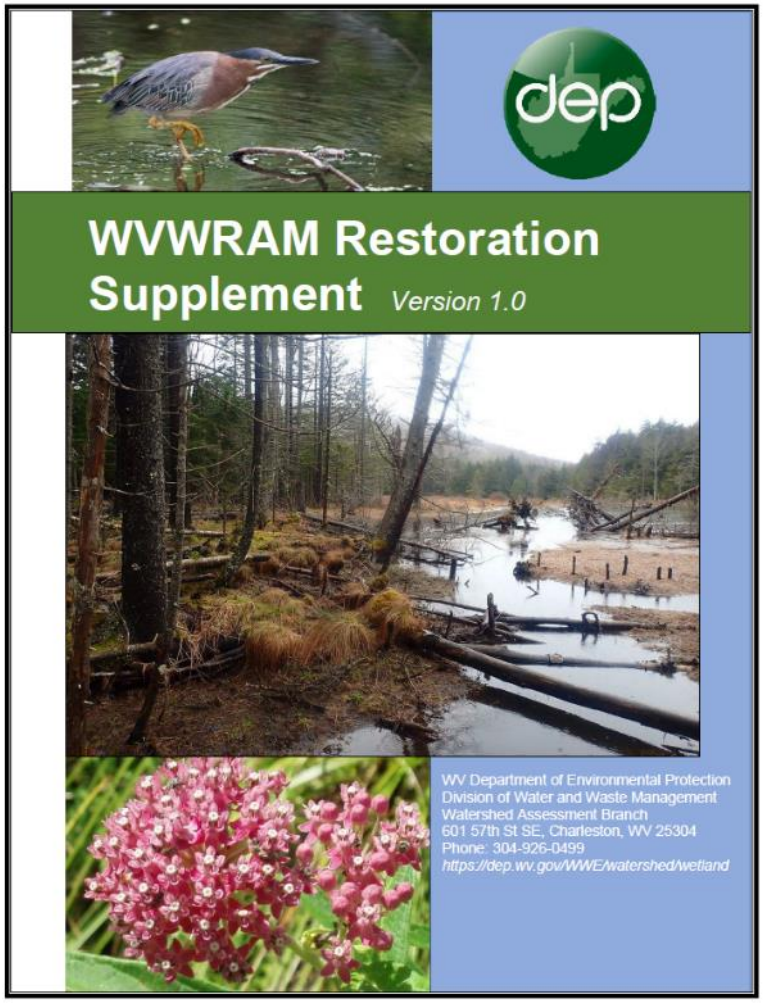
- Hydric Soils Workshop September 20th with NRCS and USFS in Elkins, WV
- Watershed Assessment staff training April 13th, 7 DEP staff completed 3-day training, 6 completed regulator 2-day training, WVWRAM cross-training on-going

Support for the Regulatory Rollout to Wetland Functional Assessment

- Regulator trainings (3) and User Trainings (4)
  - WVWRAM Training for Regulators: Feb 22 & 28, Aug 22-23
  - WVWRAM User Trainings: Apr 25-26, May 9-11, Jul 25-27

Support for the Regulatory Rollout to Wetland Functional Assessment

- WVWRAM Restoration Supplement
- Performance Standards for Mitigation Banking, draft



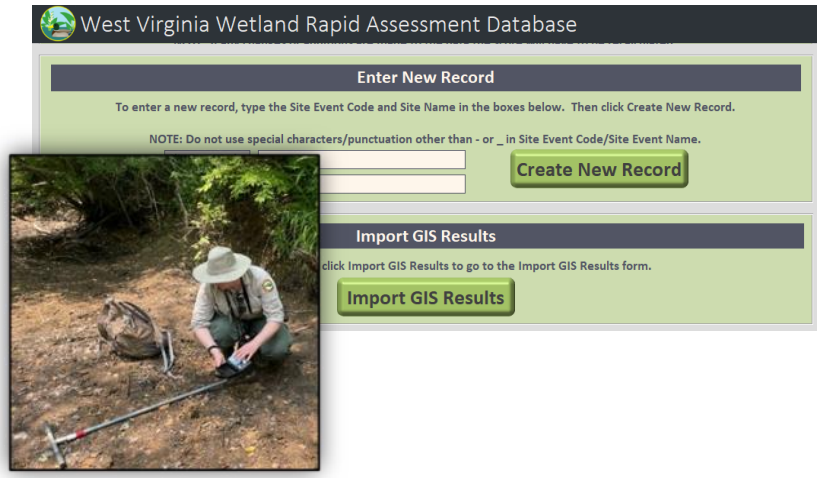
Probabilistic and Restoration Monitoring

- Probabilistic: completed year 4!
- Sampling goals were reduced due to training this year: 20 probabilistic, 3 restoration
- Total sites attempted: 51 (16 no access)
- Probabilistic sites sampled: 20
- Restoration sites sampled: 8
- Training sites: 7

Method

West Virginia Wetland Rapid Assessment Method (WVWRAM)

- WVWRAM combines two elements: Field Assessment + GIS
  - Field Assessment: data collected for buffers, topography and structure, hydrology, stressors, soils, and vegetation
  - GIS: shapefile of field mapped, attributed wetland polygon submitted to GIS Tool, which returns excel file with preliminary scoring



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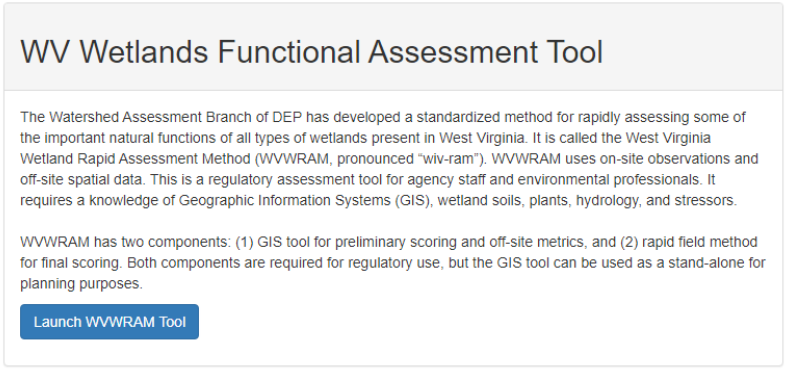


Method

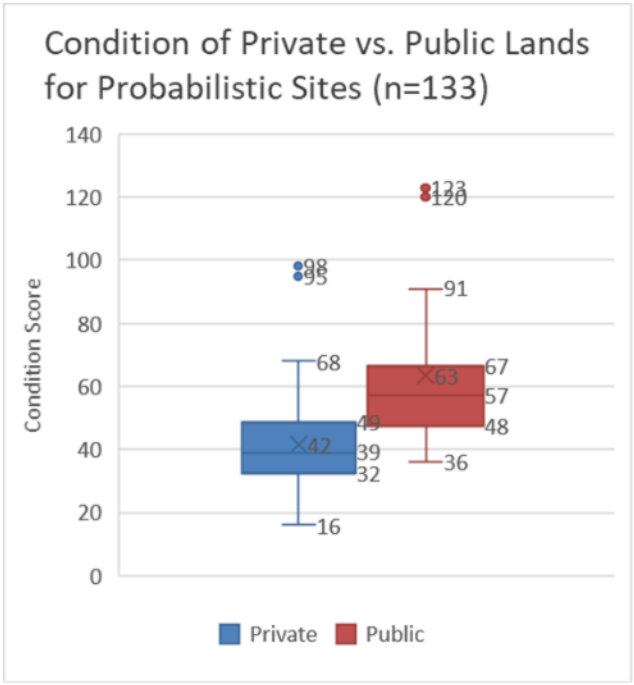
- Additionally, WQ samples: probabilistic sites only, where surface water present, lab analysis of Al, Fe, Mn, Alkalinity, Chloride, Sulphate, TSS, Total Nitrogen, and Total Phosphorous, in-situ readings for pH, DO, Temp, and Specific Conductivity.
    - “Almost no significant correlation between wetland condition and WQ to date” – Elizabeth Byers
    - WQ sampling will be reevaluated after year 5

Probabilistic Monitoring

- Importance of 5-year baseline
  - Monitoring samples vary from year-to-year depending on staff availability
    - COVID, 2020 – largest number of samples
    - Training for regulatory rollout and turnover – lower numbers of samples

Probabilistic Monitoring 2023

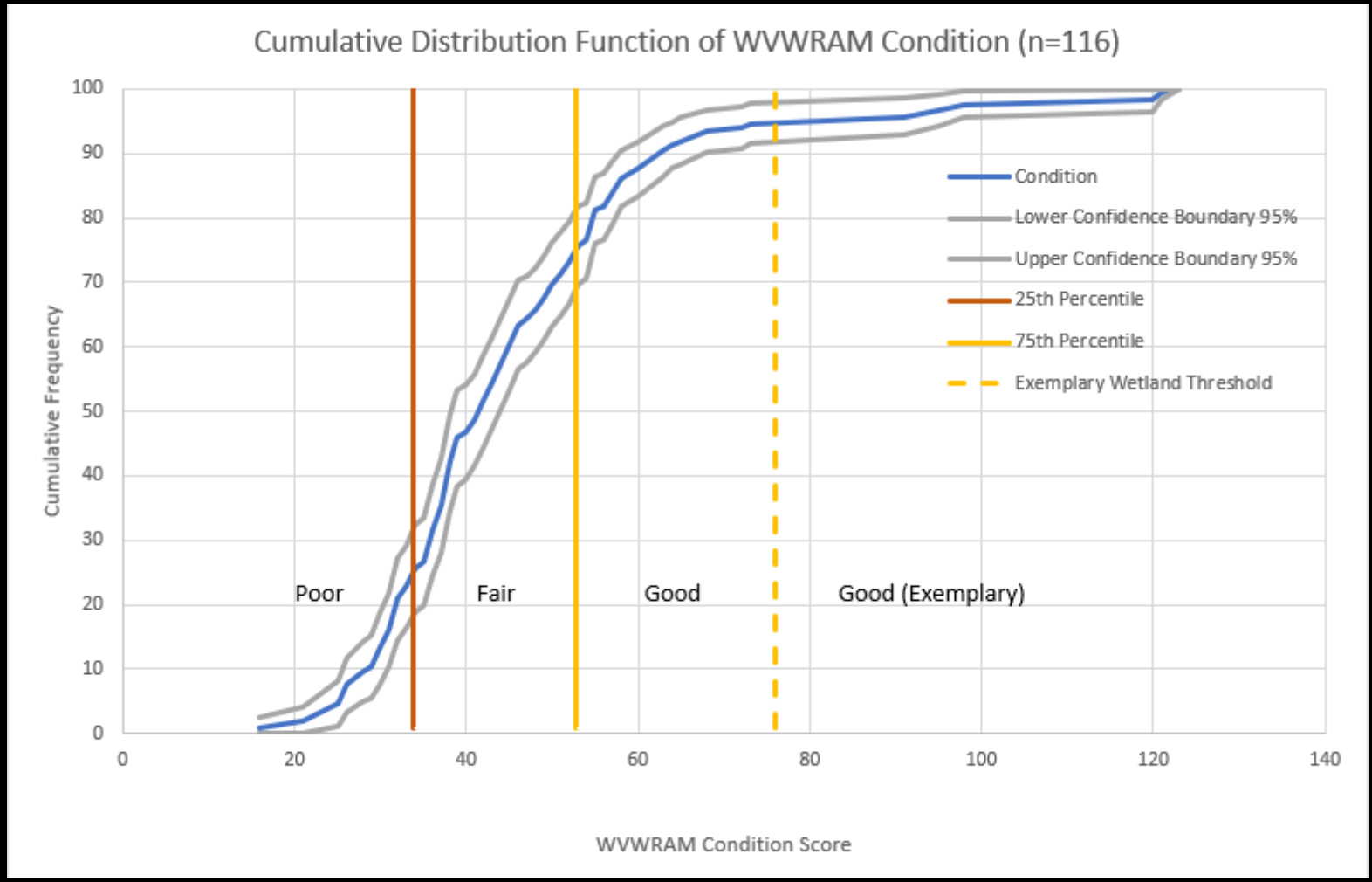
- Refusal/no access on private lands @ 44%
- Additional effort continues to be made for private land access
  - Reformatting letter to landowners for increase response
- Only sampling public lands wouldn't be representative of overall state wetland condition in WV



Monitoring

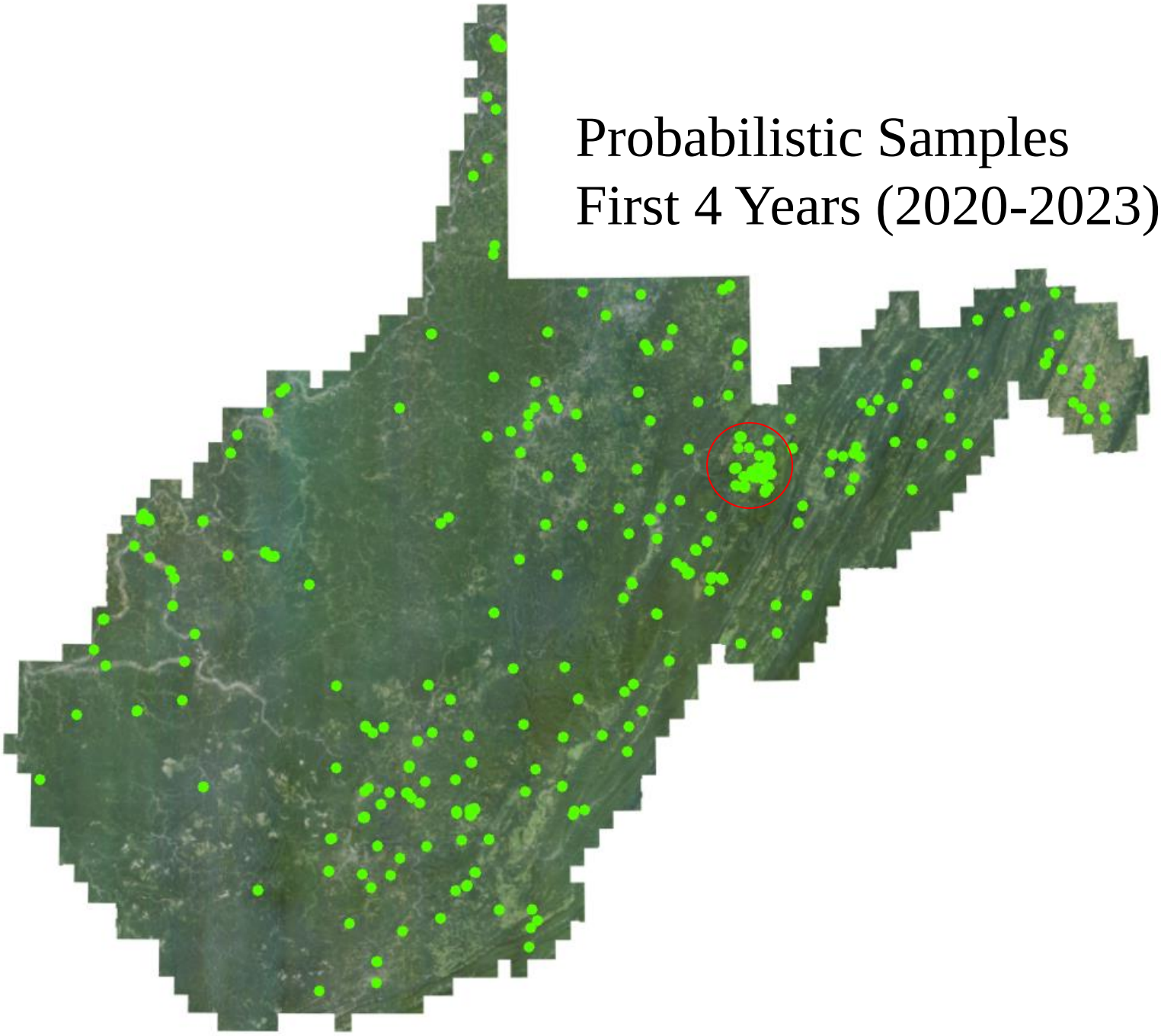
- Using 116 probabilistic samples as of 2022 season
- Calculated Cumulative Distribution Function of WVWRAM Condition Score. Best professional judgment to set thresholds set at 25% and 75%, with Exemplary sites above the 95th percentile (>76).
- Bias toward public land due to difficultly in accessing private
    - Private land sites are weighted more heavily in the CDF, with the resulting weight being about 1.6x that of public lands

	Poor (below 25th percentile	Fair (25th - 75th percentile)	Good (above 75th percentile)	Exemplary
Overall Condition	0-34	35-53	54-76	>76



Probabilistic Monitoring: Next Steps

- Next steps:
  - Complete year 5 probabilistic monitoring to acquire baseline
  - Jan-Mar 2025: New draw with help from EPA
    - Next 5-year cycle monitoring
  - Next 5 years of monitoring to compare to baseline


Probabilistic Samples
First 4 Years (2020-2023)

Notable Sampling Locations - 2022

Horseshoe Fen at Left Fork/Red Creek

Little Blackwater River South

Notable Sampling Locations - 2023

Peatland and Woodland on North Fork/Blackwater River

Notable Sampling Locations - 2023

Glade Run Southwest Beaver Complex and Shrub Swamp

Regional Monitoring Network (RMN)

- Long-term monitoring at high-quality reference wetland: Big Glade in Cranberry Glades Botanical Area
- Partners: US EPA, WVDNR, USFS, and NRCS

Regional Monitoring Network (RMN)

- Two rounds multi-spectral drone imagery have been acquired (2020 & 2023)
- Vegetation data collections in June and August 2023 to be used in classification of drone imagery (157 occurrences, 234 locations) → baseline vegetation maps
- Three wells + 1 piezometer installed August 1, 2023 with level loggers (monitored quarterly)
- Soil profiles at ea. site described by NRCS

Big Glade, Cranberry Glades Botanical Area

NWI Mapping

- Updating wetland maps for 47 counties
  - Northern 23 counties
    - Contract awarded to Ducks Unlimited
  - Southern 24 counties
    - Contract awarded to St. Mary's University
  - Drafts have been reviewed by WVDEP and are to be submitted to the NWI for final checks
  - Will be served to the public on the USFWS Wetlands Mapper website

Public Outreach – Twin Falls SP

- Fact sheets, videos, and on-site signage for 12 featured WV wetlands

Public Outreach 2023

- Vernal pool monitoring workshops (5), with 102 participants.
- iNaturalist “Vernal Pools of West Virginia” with 75 observers and 177 observations

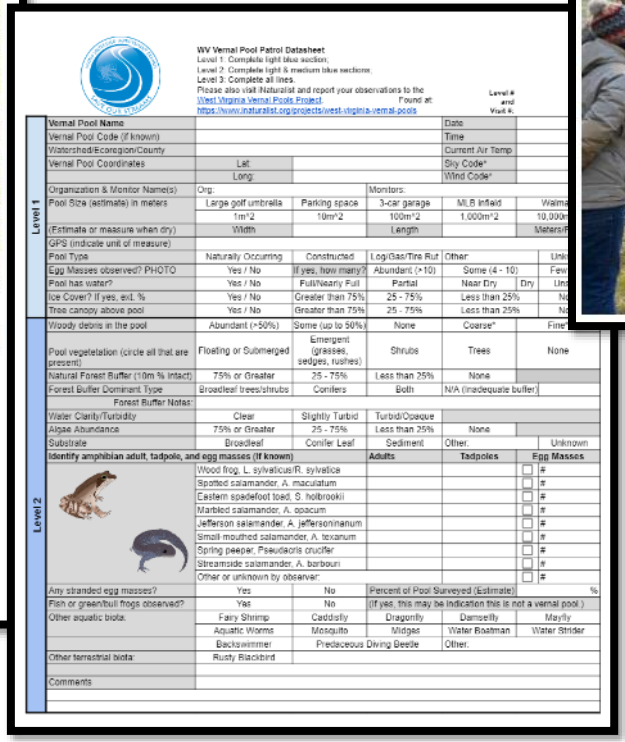
Vernal Pool Monitoring Continued

Vernal Pool near Upper Shavers Fork of the Cheat, Randolph County, West Virginia

West Virginia Vernal Pool Volunteer Monitoring Manual

Funded in part by the United States Environmental Protection Agency Wetlands Program Development Grant

Developed in Partnership with the following Agencies:
West Virginia Department of Environmental Protection
West Virginia Division of Natural Resources
United States Geological Survey - Amphibian Research and Monitoring Initiative (USGS-ARMI)
United States Fish & Wildlife Service - Canaan Valley National Wildlife Refuge



WV Vernal Pool Patrol Datasheet
Level 1: Complete light blue section;
Level 2: Complete light & medium blue sections;
Level 3: Complete all lines.
Please also visit iNaturalist and report your observations to the West Virginia Vernal Pools Project. Found at: https://www.inaturalist.org/projects/west-virginia-vernal-pools

Level 1

Vernal Pool Name				Date:	
Vernal Pool Code (if known)				Time:	
Watershed/Ecoregion/County				Current Air Temp:	
Vernal Pool Coordinates	Lat:			Sky Code*:	
	Long:			Wind Code*:	
Organization & Monitor Name(s):	Org:		Monitors:		
Pool Size (estimate) in meters	Large golf umbrella	Parking space	3-car garage	MLB Infield	Walma
	1m^2	10m^2	100m^2	1,000m^2	10,000
(Estimate or measure when dry)	Width		Length		Meters/F
GPS (indicate unit of measure)					
Pool Type	Naturally Occurring	Constructed	Log/Gas/Tire Rut	Other:	Unk
Egg Masses observed? PHOTO	Yes / No	If yes, how many?	Abundant (>10)	Some (4 - 10)	Few
Pool has water?	Yes / No	Full/Nearly Full	Partial	Near Dry	Dry Unc
Ice Cover? If yes, est. %	Yes / No	Greater than 75%	25 - 75%	Less than 25%	No
Tree canopy above pool	Yes / No	Greater than 75%	25 - 75%	Less than 25%	No

Level 2

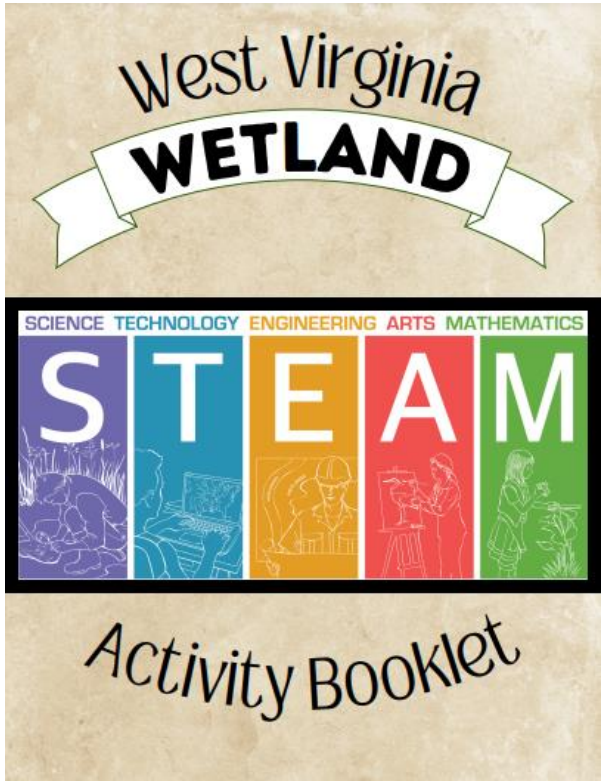
Woody debris in the pool	Abundant (>50%)	Some (up to 50%)	None	Coarse*	Fine*
Pool vegetetation (circle all that are present)	Floating or Submerged	Emergent (grasses, sedges, rushes)	Shrubs	Trees	None
Natural Forest Buffer (10m % intact)	75% or Greater	25 - 75%	Less than 25%	None	
Forest Buffer Dominant Type	Broadleaf trees/shrubs	Conifers	Both	N/A (inadequate buffer)	
Forest Buffer Notes:					
Water Clarity/Turbidity	Clear	Slightly Turbid	Turbid/Opaque		
Algae Abundance	75% or Greater	25 - 75%	Less than 25%	None	
Substrate	Broadleaf	Conifer Leaf	Sediment	Other:	Unknown

Identify amphibian adult, tadpole, and egg masses (if known)	Adults	Tadpoles	Egg Masses
Wood frog, L. sylvaticus/R. sylvatica			#
Spotted salamander, A. maculatum			#
Eastern spadefoot toad, S. holbrookii			#
Marbled salamander, A. opacum			#
Jefferson salamander, A. jeffersonianum			#
Small-mouthed salamander, A. texanum			#
Spring peeper, Pseudacris crucifer			#
Streamside salamander, A. barbouri			#
Other or unknown by observer:			#

Any stranded egg masses?	Yes	No	Percent of Pool Surveyed (Estimate)		%
Fish or green/bull frogs observed?	Yes	No	(If yes, this may be indication this is not a vernal pool.)		
Other aquatic biota:	Fairy Shrimp	Caddisfly	Dragonfly	Damselfly	Mayfly
	Aquatic Worms	Mosquito	Midges	Water Boatman	Water Strider
	Backswimmer	Predaceous Diving Beetle	Other:		
Other terrestrial biota:	Rusty Blackbird				
Comments					

Public Outreach 2023

- Wetland education workshops (3)
  - 40 formal/10 informal educators reached
- K-12 STEAM science booklet. 1000 copies being distributed to WV educators. Available online in digital form.



West Virginia WETLAND

SCIENCE TECHNOLOGY ENGINEERING ARTS MATHEMATICS

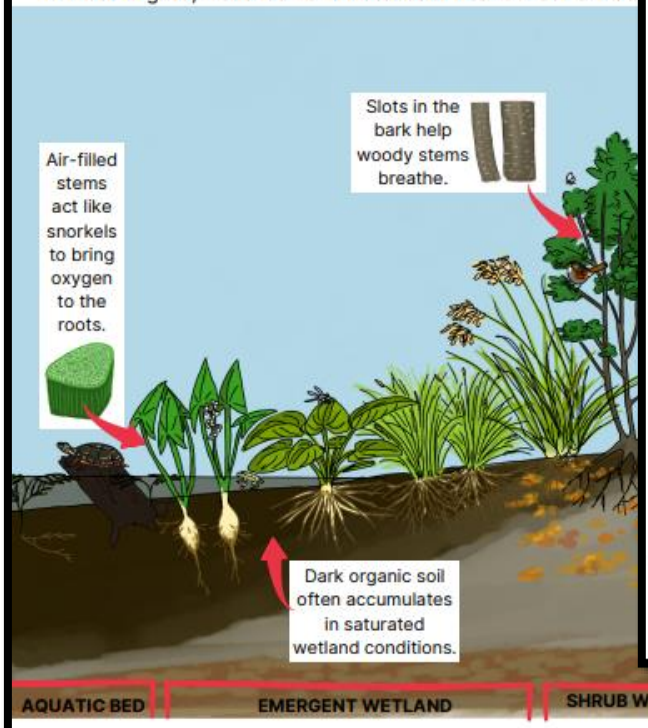
STEAM

Activity Booklet

Public Outreach 2023

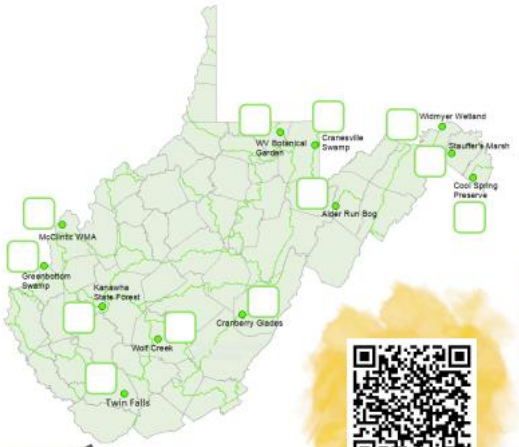
DEFINING A WILD & WONDERFUL WETLAND

In West Virginia, wetlands have water at or near the soil surfac



WETLAND LOCATIONS

There is no shortage of wetlands to visit in our Mountain State. To highlight West Virginia's wetland diversity, short videos and fact sheets have been created for 12 wetlands. Scan the QR code below to learn more!



Visit the wetland near you or check out all 12!

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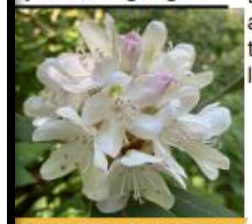
FORESTED SWAMP

Species Highlight



Great Rhododendron

Rhododendron is West Virginia's state flower. It is also a beautiful pollinator in our wetlands, attracting butterflies and hummingbirds to feed on its nectar. It grows in acidic soils, moist dry forests, and in swamps.

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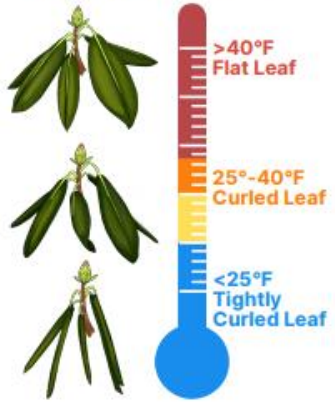
Did you know that rhododendrons are also nature's thermometer? Tell the temperature by looking at their leaves. Are they flat or curled?



Thank you!
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Kylie.J.Joins@wv.gov
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