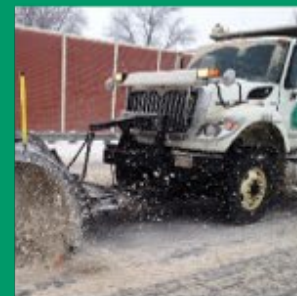
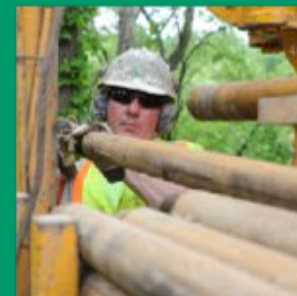
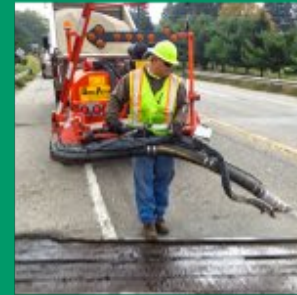


POST-CONSTRUCTION GROUNDCOVER ON HIGHWAY ROW

RIGHTS OF WAY AS HABITAT WORKING GROUP

FEBRUARY 20, 2019



OHIO DEPARTMENT OF
TRANSPORTATION

How We Got Here

- ODOT Wildflower Program – **1990s**
- ODOT roadside pollinator habitat pilot (**Pheasants Forever**) - **2011**
- ODOT roadside pollinator habitat expansion (**Dawes Arboretum**) - **2014**
- ODOT helps form Ohio Pollinator Habitat Initiative (OPHI) - **2015**
- ODOT creates standalone Pollinator Habitat Program - **2017**

Ohio Pollinator Habitat Initiative (OPHI)

- Assisted ODOT with design of roadside pollinator mixes
- Assisted ODOT with establishment of new pollinator habitat protocols
 - Site assessment
 - Site establishment
 - Site maintenance
 - Site monitoring
- Assisted State of Ohio with new multiple-award seed contract
- Assists ODOT with new seed mixes, including post-construction



Why ODOT Cares About Habitat

- Saves taxpayers money
- Opportunity cost
- Regulatory
- Good stewards of the environment
- Favorable public relations



Beyond Roadside Restoration Projects

- ODOT facilities (garages, rest areas, weigh stations)
- Interpretive gardens at Ohio Welcome Centers
- Community/Business Gateways (P3s)
- Brownfields to Blooms
- BioSwitch Erosion Control Sock
- Mowing reduction
- **Post-construction**



Post-Construction Opportunities

- ODOT has the fourth-largest interstate highway system in the country
- ODOT manages 19,000 miles of roadsides comprising 260,000 acres
- Since 2011, ODOT has constructed 8,000 projects costing \$16.4 billion



Post-Construction Groundcover Research Project

- Project title:
 - *“Evaluate and Develop Post-Construction Groundcover that Meets Erosion and Sediment Goals and is Beneficial to Pollinators”*
- Two phases
- Five-year study
- Led by Davey Resource Group



Post-Construction Groundcover Research Project

- Post-Construction Groundcover Research Project Challenges
 - Roadside habitat contains highly compacted soils of poor quality
 - Salt-laden storm water runoff is typical
 - Native seed is expensive
 - Native seed is slow to establish
 - Fear of change

CHALLENGE



Post-Construction Groundcover Research Project

- Post-Construction Groundcover Research Project Goals
 - Identify post-construction groundcover seed mixes that will:



- Benefit pollinators
- Be comparable in cost to existing post-construction groundcovers
- Reduce ODOT's roadside maintenance costs
- Include a mix of Ohio native grasses
- Not obstruct motorists' line of sight
- Enhance roadside aesthetics
- Provide stormwater benefits

Post-Construction Groundcover Research Project

- Phase 1 Project Overview
 - Literature review
 - Survey surrounding state DOTs
 - Evaluate ODOT's current post-construction groundcovers
 - Develop matrix of alternative seed mixes consisting of:

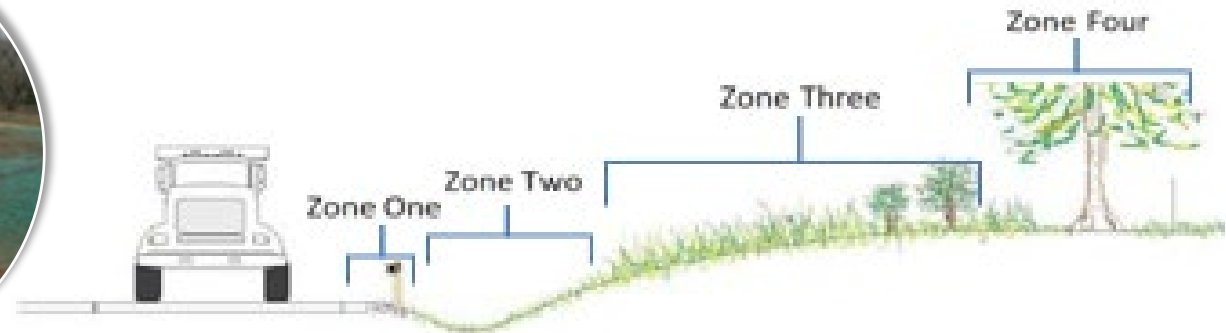
INFIELDS - MEADOWS (WET/DRY)																	
Slope Designation →		ODOT Current Mixes (\$59.09)						Pheasants/Quail Forever Mixes				D&G Seed Mixes				3:1 slopes or flatter	
Use Designation →		3:1 slopes or flatter				2:1 slopes or flatter		Any		2:1 slopes or flatter				Any		3:1 slopes or flatter	
		Zones 1-4 (In front of residences; commercial properties; between curb and sidewalk)		Zones 1-4 (Low-growing/mowed areas)		Zones 2-4 (Shale or rocky slopes)		Zones 3-4 (min-mow areas; non-critical visibility areas)		Zones 1-4 (temporary or cover crop seeding)		Zones 3-4 (min-mow areas; non-critical visibility areas)		Zones 1-4 (Low-growing/mowed areas; difficult to mow areas)		Zones 3-4 (min-mow areas; non-critical visibility areas)	
Category	Attribute	Class 1 Lawn Mixture	Class 2 Roadside Mixture	Class 3A Slope Mixtures	Class 3B Low Growing Slope Mixture	Class 3C Crown Vetch Mixture											
Seed Mix Characteristics	Use Rating	★★	★★	n/a	★★	★★								★★	★★★	★★★	★★★★
	Phenology	Cool Season Grasses	Cool Season Grasses	n/a	Cool Season Grasses	Cool Season Grasses								Warm-Season/Cool-Season Grasses	Warm-Season/Cool-Season Grasses	Warm-Season/Cool-Season Grasses	Warm-Season/Cool-Season Grasses
	Life Cycle	Annual/Perennial	Perennial	n/a	Annual/Perennial	Perennial								Perennial	Perennial	Perennial	Annual/Perennial
	Growth Rate	Moderate-Rapid	Moderate-Rapid	n/a	Moderate-Rapid	Moderate-Rapid								Moderate	Moderate	Moderate	Moderate
	Maximum Height (Inches)	18	36	n/a	48	48								60	84	84	84
	Root Depth (Inches)	6-30	6-30	n/a	10-30	10-30								12	10	10	10
	Soil Type	Loam, Clay	Loam, Clay	n/a	Loam, Clay	Loam, Clay								Sand, Loam, Clay	Sand, Loam, Clay	Sand, Loam, Clay	Sand, Loam, Clay
	pH Range	5.5-7.5	5.5-7.5	n/a	5.5-7.5	5.5-7.5								5.0-7.5	4.5-8.0	4.5-7.5	4.5-7.5
	Germination	Rapid	Rapid	n/a	Rapid	Rapid								Rapid	Moderate to Rapid	Moderate	Moderate
	Bloom Period	May-July	May-July	n/a	May-July	May-July								May-September	May-October	May-October	May-October
Tolerances	Establishment Period	☀☀☀	☀☀☀	n/a	☀☀☀	☀☀☀								☀☀☀	☀☀☀	☀☀☀	☀☀☀
	Sunlight Requirement	☀☀☀	☀☀☀	n/a	☀☀☀	☀☀☀								☀☀☀	☀☀☀	☀☀☀	☀☀☀
	Hardiness Zone	5a	5a	n/a	5a	5a								5a, 5b, 6a, 6b	5a, 5b, 6a, 6b	5a, 5b, 6a, 6b	5a, 5b, 6a, 6b
	Native Status (* Annual Rye Introduced)	Introduced	Introduced	n/a	Introduced	Introduced								Introduced	Native/Introduced	Native	Native*
	Indicator Status	FAC to UPL	FAC to UPL	n/a	FAC to UPL	FAC to UPL								FACU	FACW to OBL	FACW to OBL	FACW to OBL
	Drought Tolerance	☀☀☀	☀☀☀	n/a	☀☀☀	☀☀☀								☀☀☀	☀☀☀	☀☀☀	☀☀☀
	Tolerance to Significant Sheet Flow	Tolerant	Tolerant	n/a	Tolerant	Tolerant								Tolerant	Tolerant	Tolerant	Tolerant
	Salt Tolerance	Low-Moderate	Low	n/a	Low-Moderate	Low								Moderate to High	High	Moderate	Moderate
	Tolerance to Disturbance/ Mowing	High	High	n/a	High	High								Moderate	High	Moderate	Low
	Soil Compaction Tolerance	Moderate-High	Moderate-High	n/a	Moderate-High	Moderate-High								Moderate	Moderate	Moderate	Moderate
Environmental Benefits	Attractiveness to Pollinators	Low	Low	n/a	Low	Low								Low	Low	Very High	Moderate to High
	Water Quality Benefits	Low-Moderate	Low-Moderate	n/a	Low-Moderate	Low-Moderate								Moderate to High	High	Moderate to High	Moderate to High
	Erosion Control Benefits	☀☀☀	☀☀☀	n/a	☀☀☀	☀☀☀								☀☀☀	☀☀☀	☀☀☀	☀☀☀
Cost	Price Per Pound	\$2.48	\$2.61	n/a	\$2.94	\$20.94								\$28.40 (Quail), \$30.95 (OPN)	\$3.85 (OPN)	\$12.31 (Emul), \$29.00 (OPN)	\$58.76 (Emul), \$27.00 (OPN)
	Cost to Seed 1 Acre	\$\$\$\$	\$\$\$\$	n/a	\$\$\$	\$\$\$\$\$	\$\$	\$\$\$						\$\$	\$\$\$\$	\$\$\$\$	\$\$\$\$
	Mow Cost /Acre/Year	\$84.40	\$33.76-\$84.40 + \$423.24-1,638.80 String Trimming	n/a	\$40.11	\$0.00	\$33.76	\$33.76						\$8.44	\$0.00	\$8.44	\$8.44
Seeding Rates	lb. /Acre (Ref PLS) Per Acre	348.5	304.9	n/a	101.5	130.7	*22.65 (spring), *25.26 (fall)	*16.12 (spring), *26.14 (fall)	*15.2	*60.9	*58.37 (spring), *68.39 (fall)	*2.3	*7.023	*220	*20 - 40	*20	*20
	lb. Per 1000 m²	8	7	n/a	2.33	3	0.53 (spring), 0.58 (fall)	0.37 (spring), 0.6 (fall)	0.35	1.398	1.34 (spring), 1.57 (fall)	0.131	0.161	5.05	0.459 - 0.918	0.459	0.459
	kg Per 1000 m²	39.04	34.36	n/a	11.37	14.64	1.41 (spring), 2.53 (fall)	1.8 (spring), 2.92 (fall)	1.71	6.82	6.54 (spring), 7.66 (fall)	0.64	0.786	24.66	2.241 - 4.482	2.241	2.241

Post-Construction Groundcover Research Project

- Phase 2 Field Trials: Planting Methods

- 70 percent water/30 percent wood fiber hydromulch
- Broadcast seeding
- Drill seeding

Zone 2 (Road Edge)	Zone 3 (Wet Ditch)	Zone 2/3/4 (Slope)	Zone 4 (Fence Line)
70/30 wood fiber hydromulch	Broadcast	Broadcast	70/30 wood fiber hydromulch
Drill seeding	70/30 wood fiber hydromulch	70/30 wood fiber hydromulch	Drill seeding



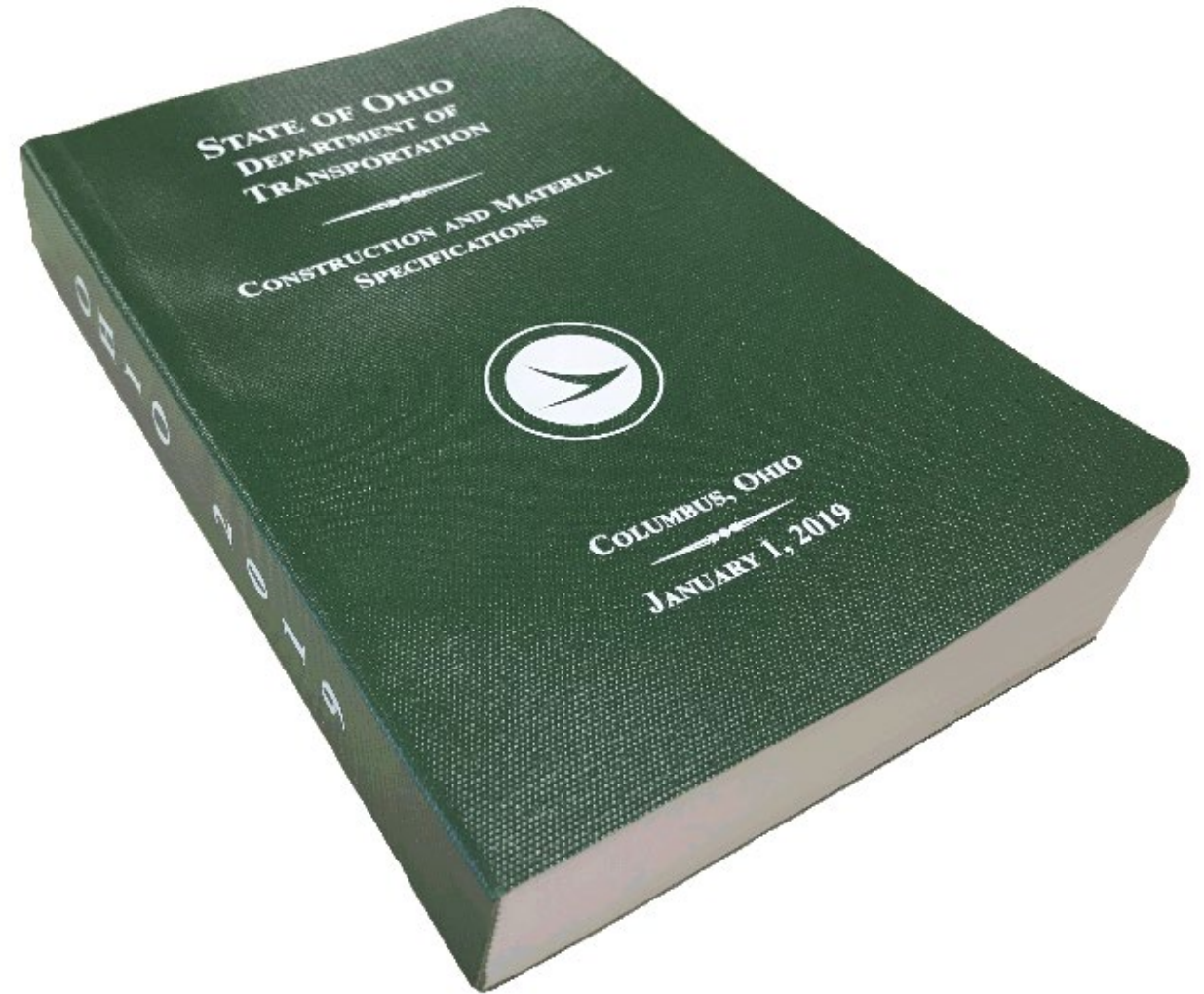
Post-Construction Groundcover Research Project

- Phase 2 Field Trials: Monitoring
 - Sites will be monitored for:
 - Vegetation coverage
 - Grass and forb species composition
 - Height
 - Entomological pollinator species composition
 - Intervals:
 - Growing season 1
 - Visual assessments at 30, 60, 90, 120, 150, 180 days
 - Growing season 2
 - Visual assessments four times
 - Growing season 3
 - Visual assessments three times



Post-Construction Groundcover Research Project

- Research deliverables
 - Decision tree
 - **Update ODOT Specification Manual**
 - *Guide for Identification of Native Plants Used in Seed Mixes*



Post-Construction Groundcover Research Project

- Threats to Successful Implementation
 - Noxious/invasive weeds
 - Woodies
 - Policy changes
 - Cost
 - Interest and availability of “Green Contractors”
 - Resistance by general contractors



Summary

- Combined, ODOT has created 80,000 acres of suitable habitat since 2017
- We will always face new challenges
 - New leadership
 - Policy changes
 - Budget constraints
 - Public opinion
- Diversity reduces risk
 - Restoration, post-construction, interpretive gardens, community/business gateways (P3s), Brownfields to Blooms, BioSwitch (or like products), IRVM
- Noxious/invasive weed and woody control must be priority number 1

Questions

