



Stormwater BMP Monitoring Program Update



June 30, 2020

Stormwater BMPs

Best
Management
Practices =

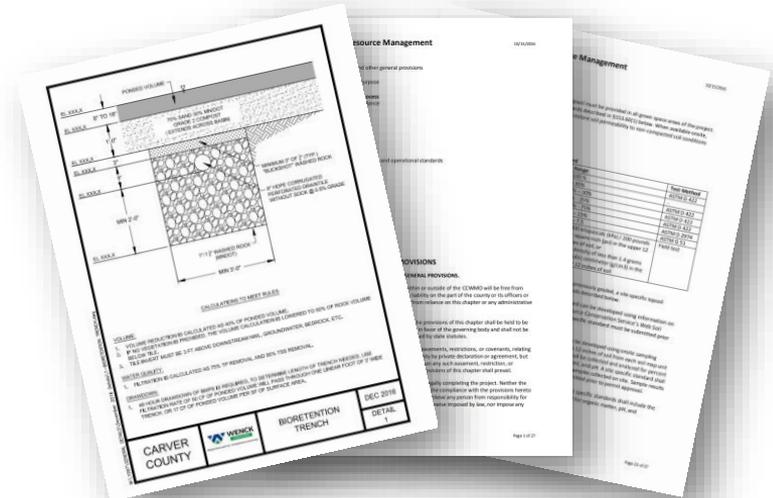
Structural or non-structural practices designed to treat, prevent, or reduce water pollution.

Summary

1. Update on BMP monitoring program.

2. Background for the **Rule** and **Guideline** revisions.

- Our role
- Monitoring process and results
- Using this data



Our Role – Develop Standards

- BMPs are constructed to meet our Rules

Standard	Purpose	Example BMPs
Volume Control	Hold water on-site	<ul style="list-style-type: none">• Stormwater reuse• Infiltration• Rock storage• Upland Preserve
Water Quality Treatment	Remove phosphorus and sediment	<ul style="list-style-type: none">• Ponds• Filtration basins, shelves, benches• Iron-enhanced sand
Rate Control	Slow water leaving the site	<ul style="list-style-type: none">• Ponds• Underground storage

Our Role – Review Process

- Review and comment on:
 - Construction details for the BMPs
 - Hydraulic models including the BMPs
 - Site info (groundwater, soil type, infiltration rates)
 - Vegetation plans
 - Materials (type of pipe, rock, soil reinforcement)



Our Role – Review Process

- Requirements and recommendations

Example Requirements

- Filter media composition
 - Filter media depth
 - Draintile diameter
- Pre-treatment sizing

Example Recommendations

- Vegetation type
- Draintile layout
- Pre-treatment style

Our Role – After Approval

- Construction oversight
 - SWCD works with contractor before and sometimes during installation
 - Site-specific observations and feedback



Our Role – Project Closeout and Monitoring

Final Inspection

- Inspection for project close-out and return of the surety
- Inspect BMPs: establishment and function
- Review record drawings and compare to approved plans

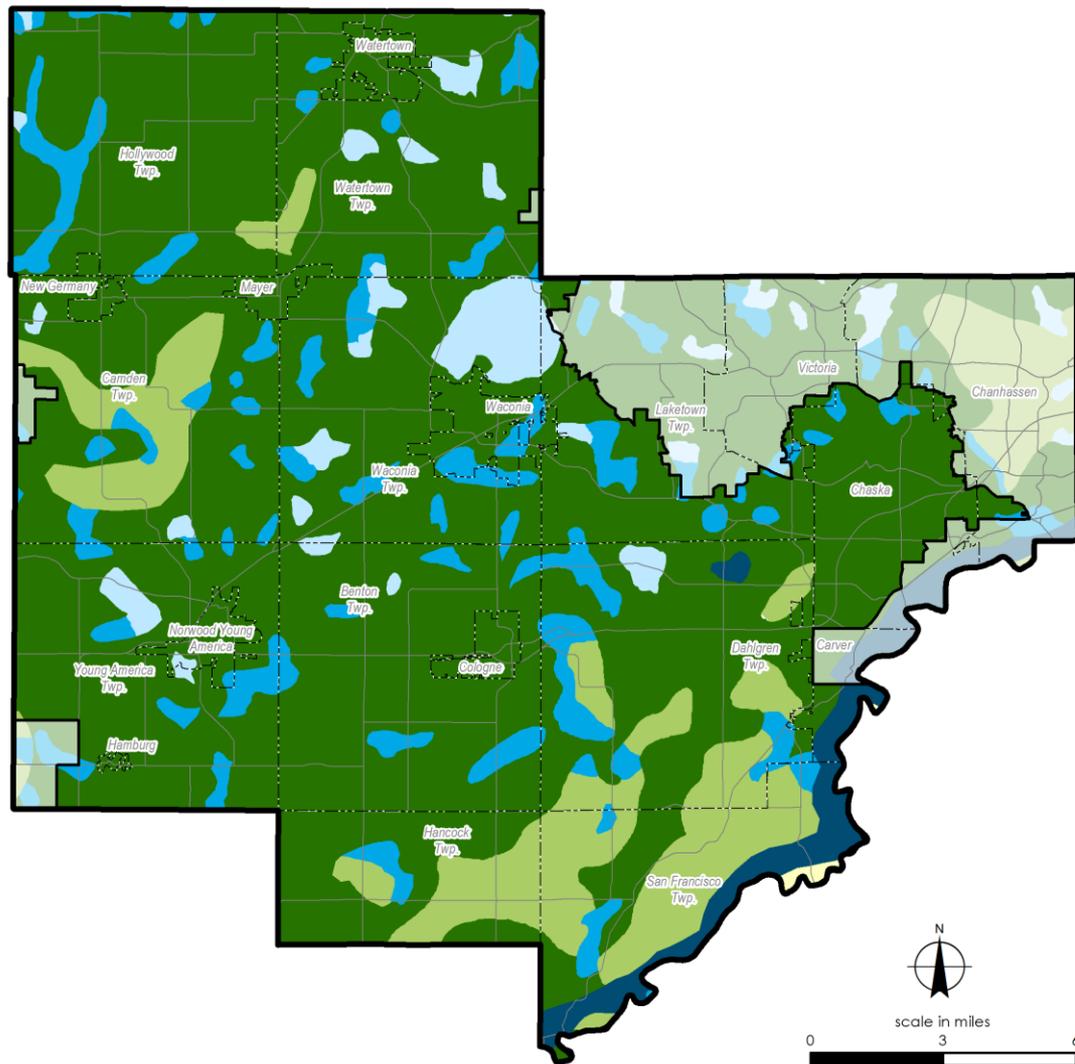
Routine Monitoring

- Checking up on these BMPs every few years.
- Our focus today.

Takeaway

Updating *Rules* and *Guidelines* based on experience with BMPs

- Updating minimum standards
- Recommendations → Requirements
- Expanding BMP design options



Legend

- County Boundary
- CCWMO Boundary
- Municipal Boundaries
- Major Roads

Presettlement Vegetation

- Forest
- Woodland
- Shrubland
- Grassland
- Forested Wetland
- Wetland
- Open water

2020-2029 Water Plan

Carver County Watershed
Management Organization



scale in miles



This map was created using Carver County's Geographic Information Systems (GIS), it is a compilation of information and data from various City, County, State, and Federal offices. This map is not a surveyed or legally recorded map and is intended to be used as a reference. Carver County is not responsible for any inaccuracies contained herein.

Carver County Stormwater BMPs

489+

constructed since 2002

125

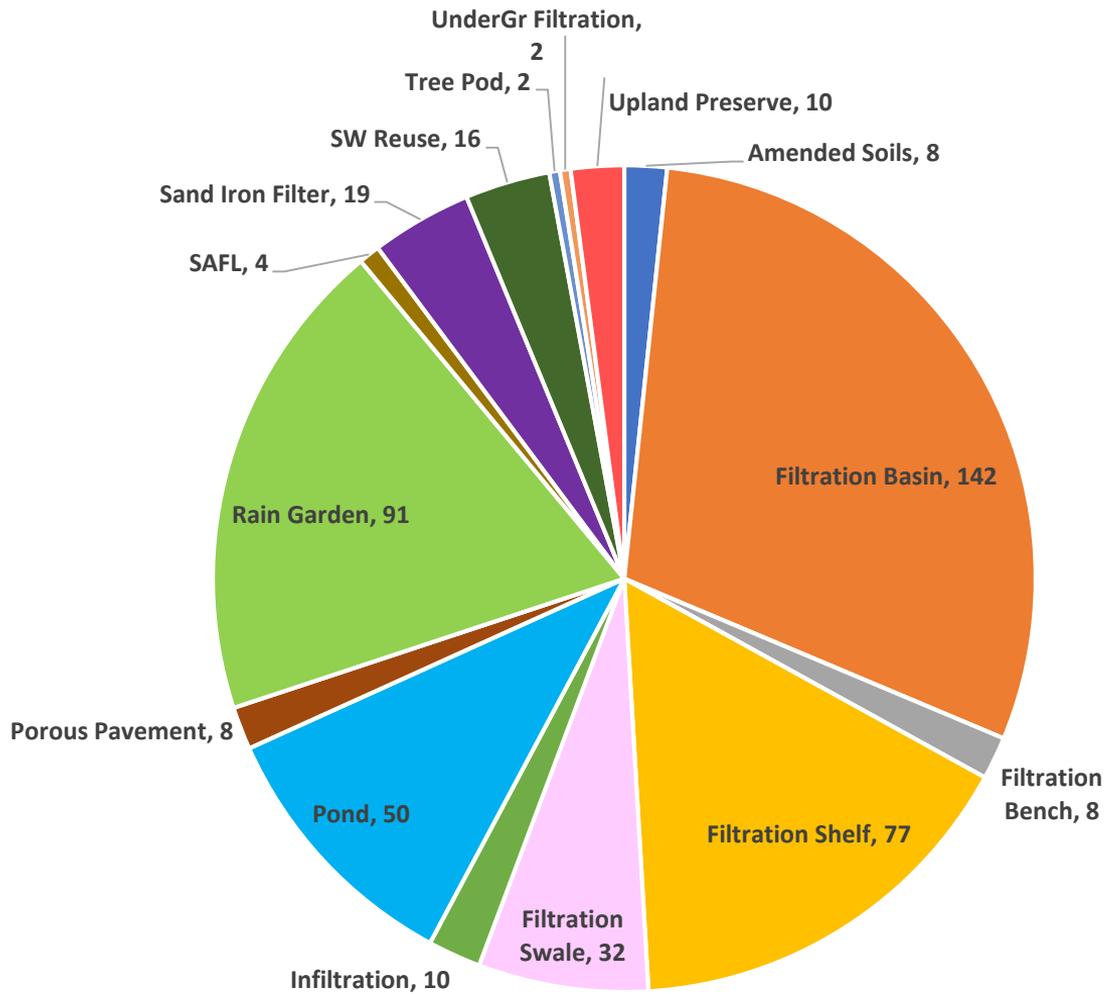
2019 inspections

170

inspected in 2017-2018

104+

2020 inspections



Carver County BMP Types



Filtration Basin



Filtration Shelf



Filtration Swale

Carver County BMP Types



Rain gardens

Carver County BMP Types:



Ponds

Carver County BMP Types

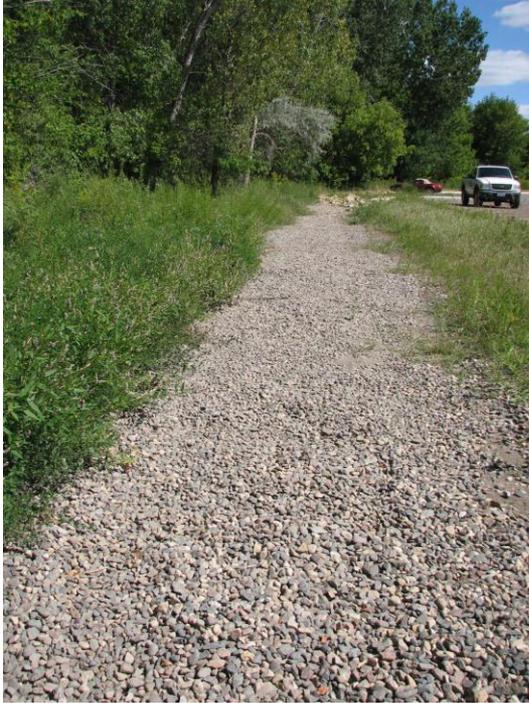


Porous Pavement



Permeable Pavers

Carver County BMP Types



Sand Iron Filter



Stormwater Reuse

Carver County BMP Types



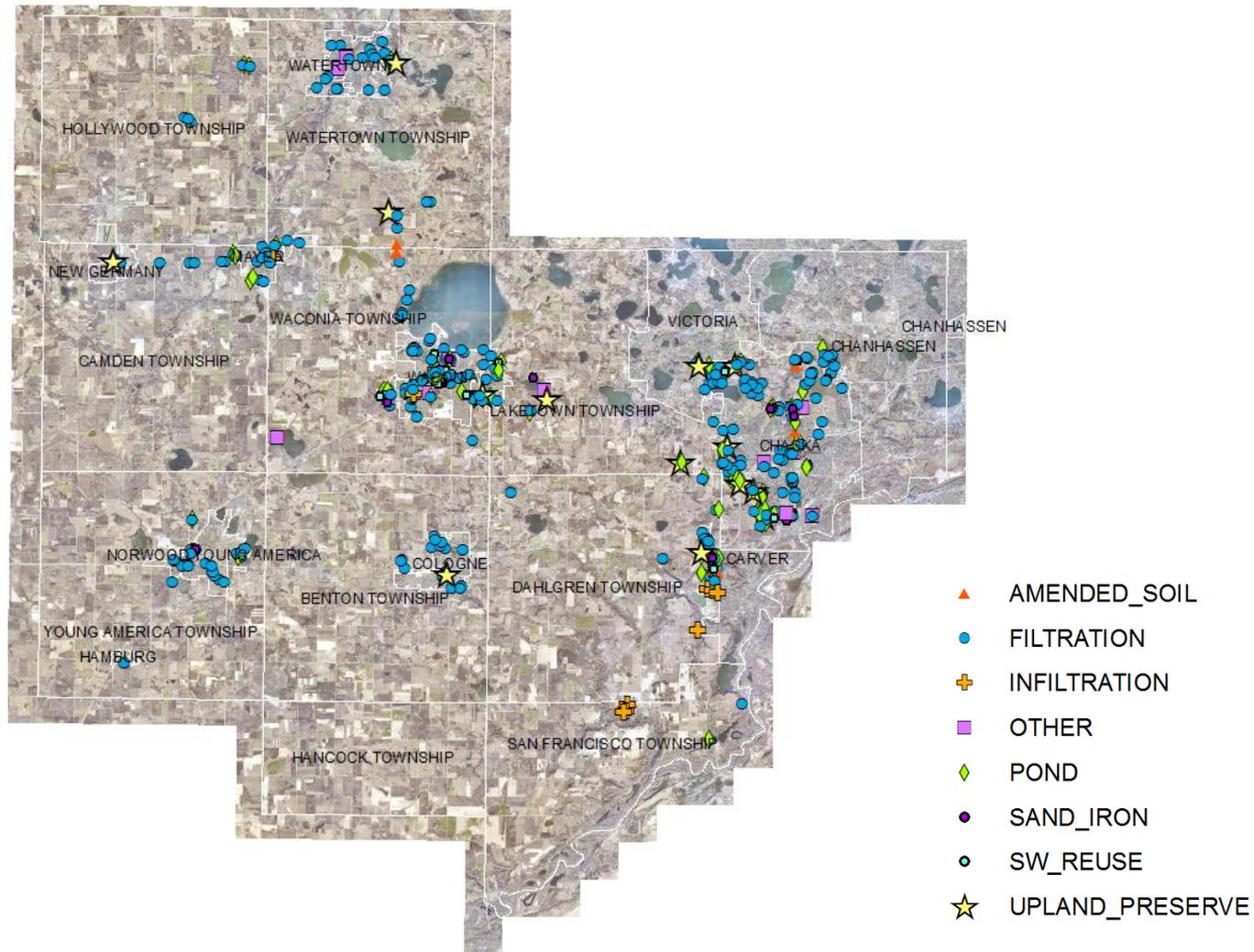
Amended Soils



(Prairie Restoration, Inc)

Upland Preserve

Where are the BMPs?



BMP Inspection



Routine Monitoring:

1. Inspection Type
2, 5, 10, and 15-year
2. Sedimentation
3. Erosion
4. Vegetation Cover
5. Vegetation Type
6. Structural Integrity
7. Filtration Function
8. Basin Function
9. Notes/Memo
10. Follow-up

BMP Inspection



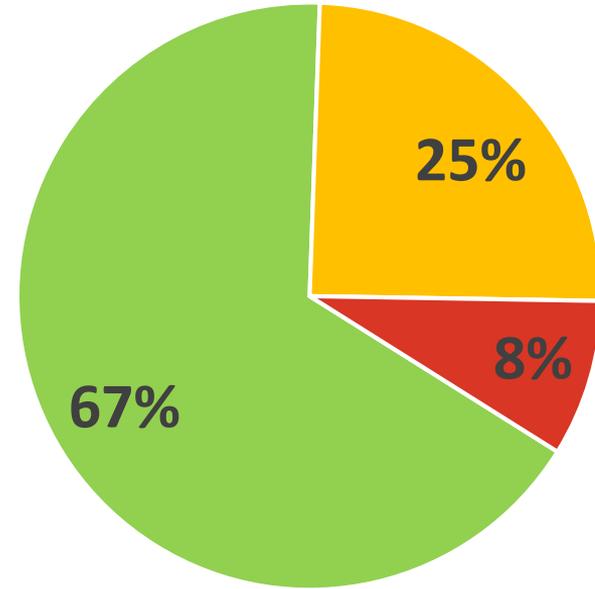
Intensive Monitoring:

1. Weather conditions
2. Inlet and outlet flow
3. Water color
4. **Samples collected**

Analyzed for:

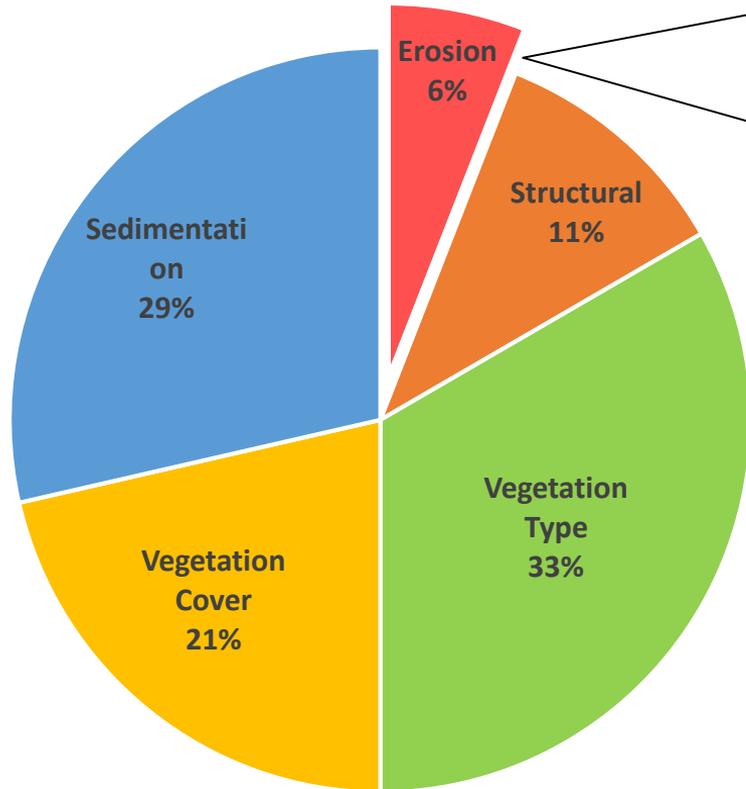
- **Total phosphorus**
- **Dissolved phosphorus**
- **Total Nitrogen**
- **Total Suspended Solids**

Overall
Performance:
2017, 2018,
& 2019

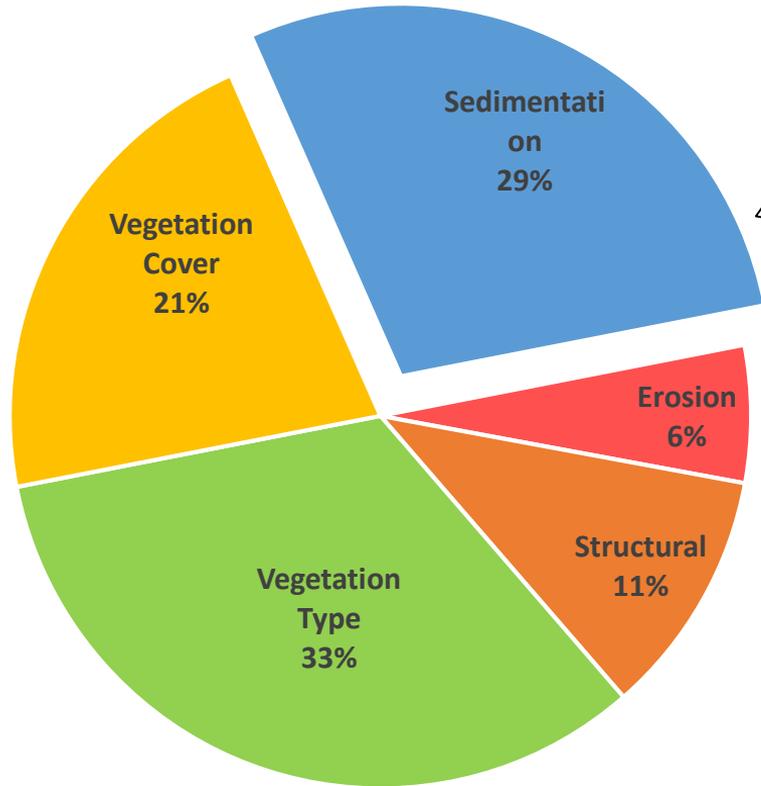


■ No Issue ■ Minor Issue ■ Serious Issue

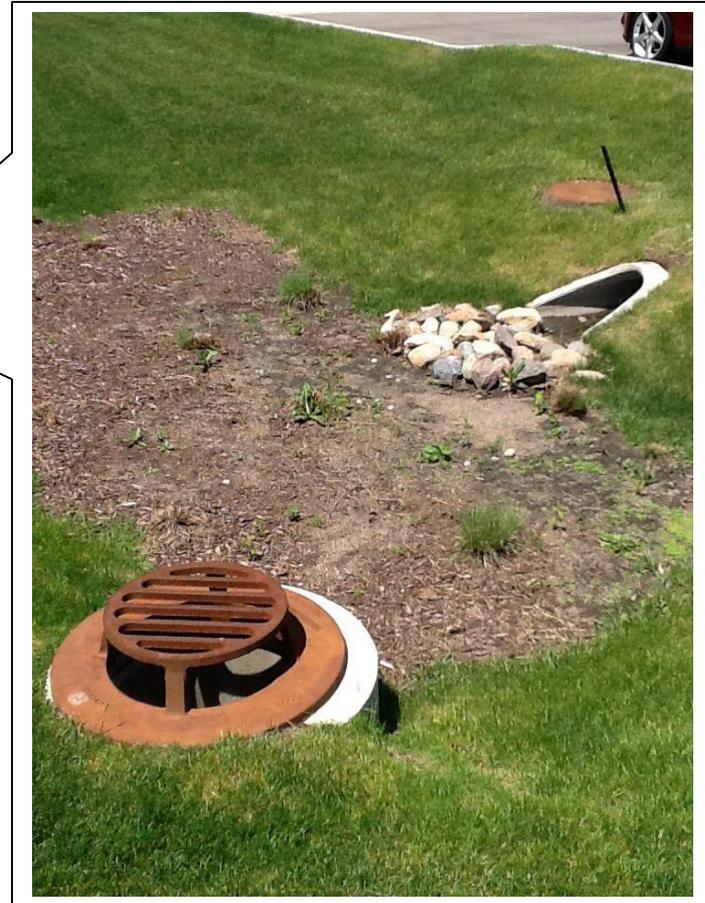
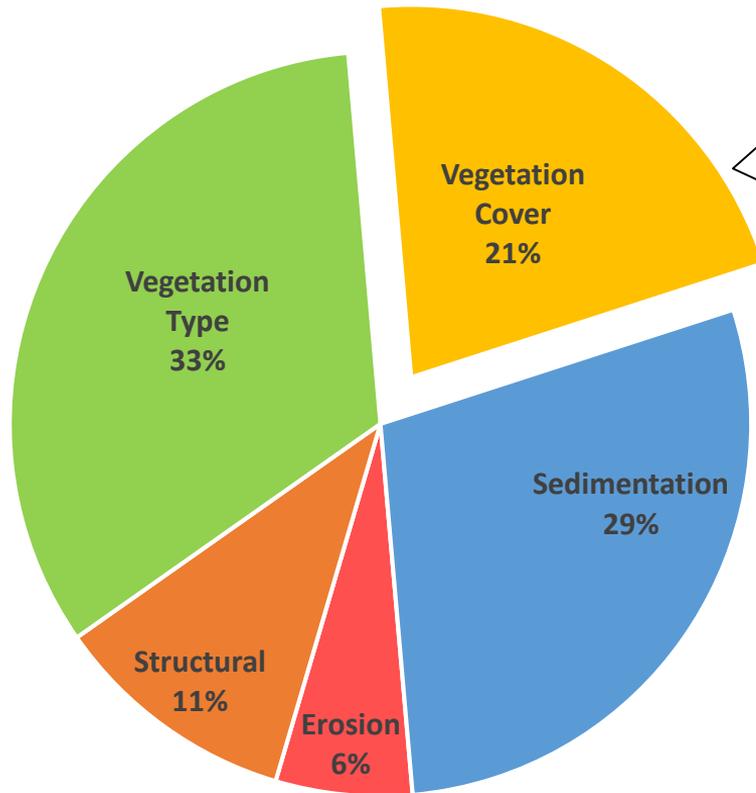
Common Types of BMP Issues



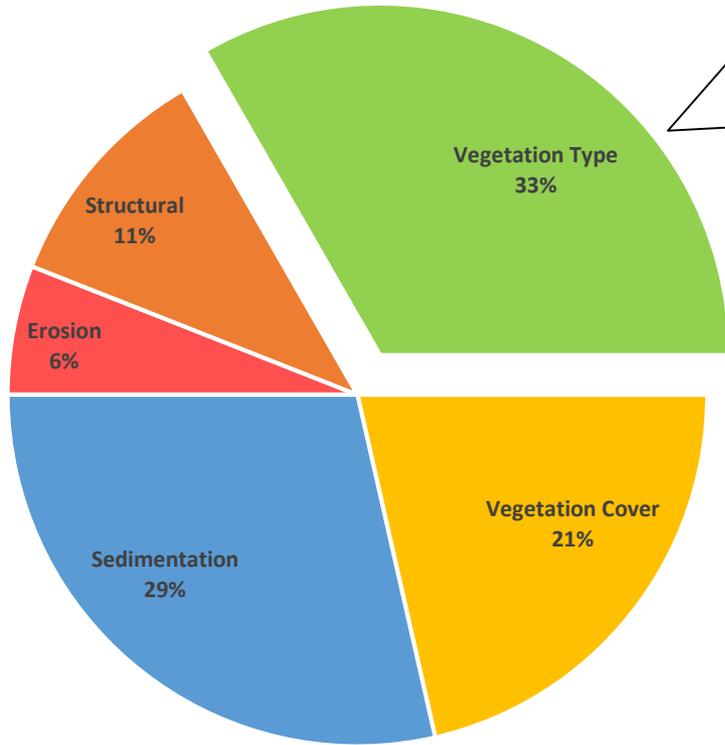
Common Types of BMP Issues



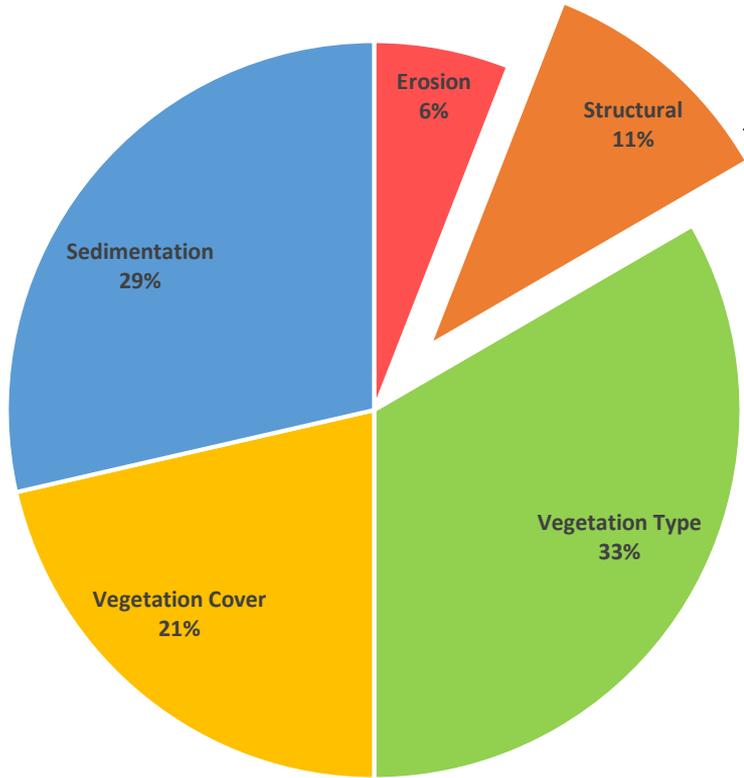
Common Types of BMP Issues



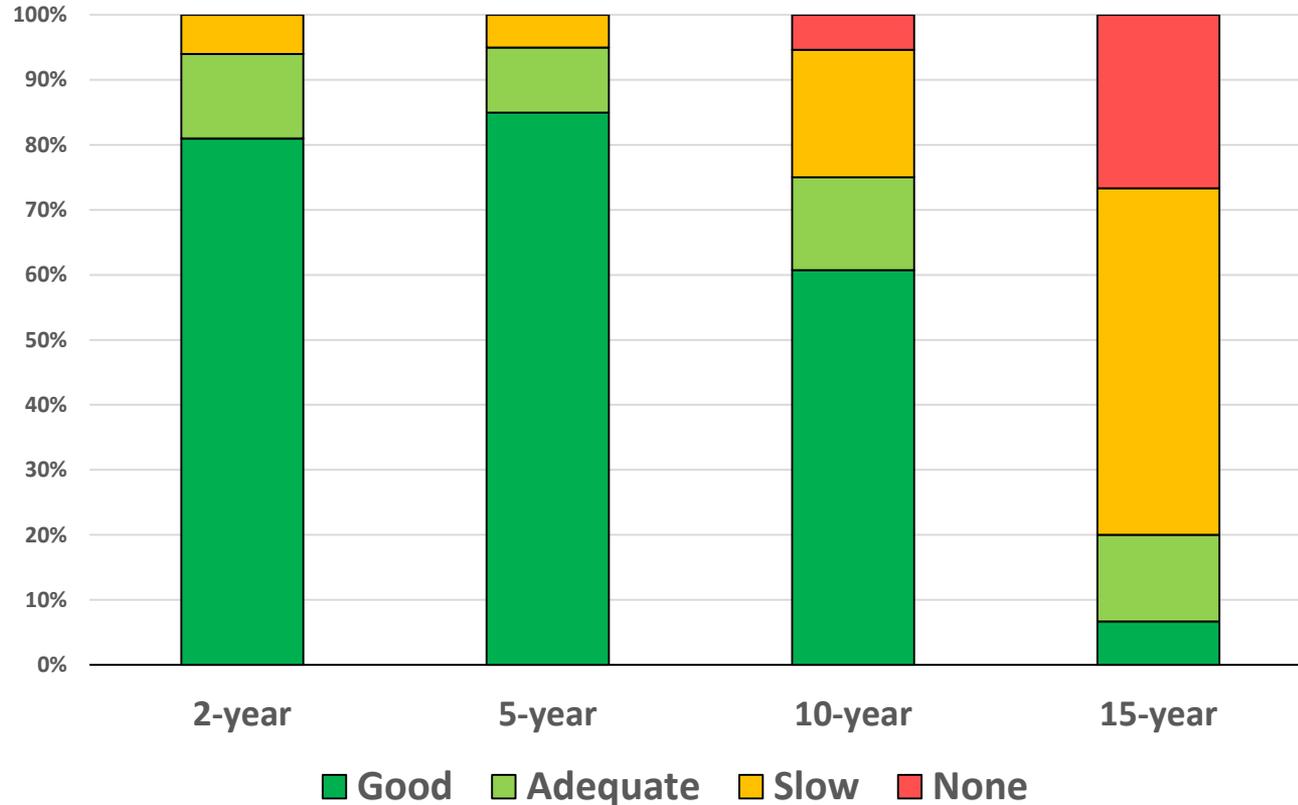
Common Types of BMP Issues



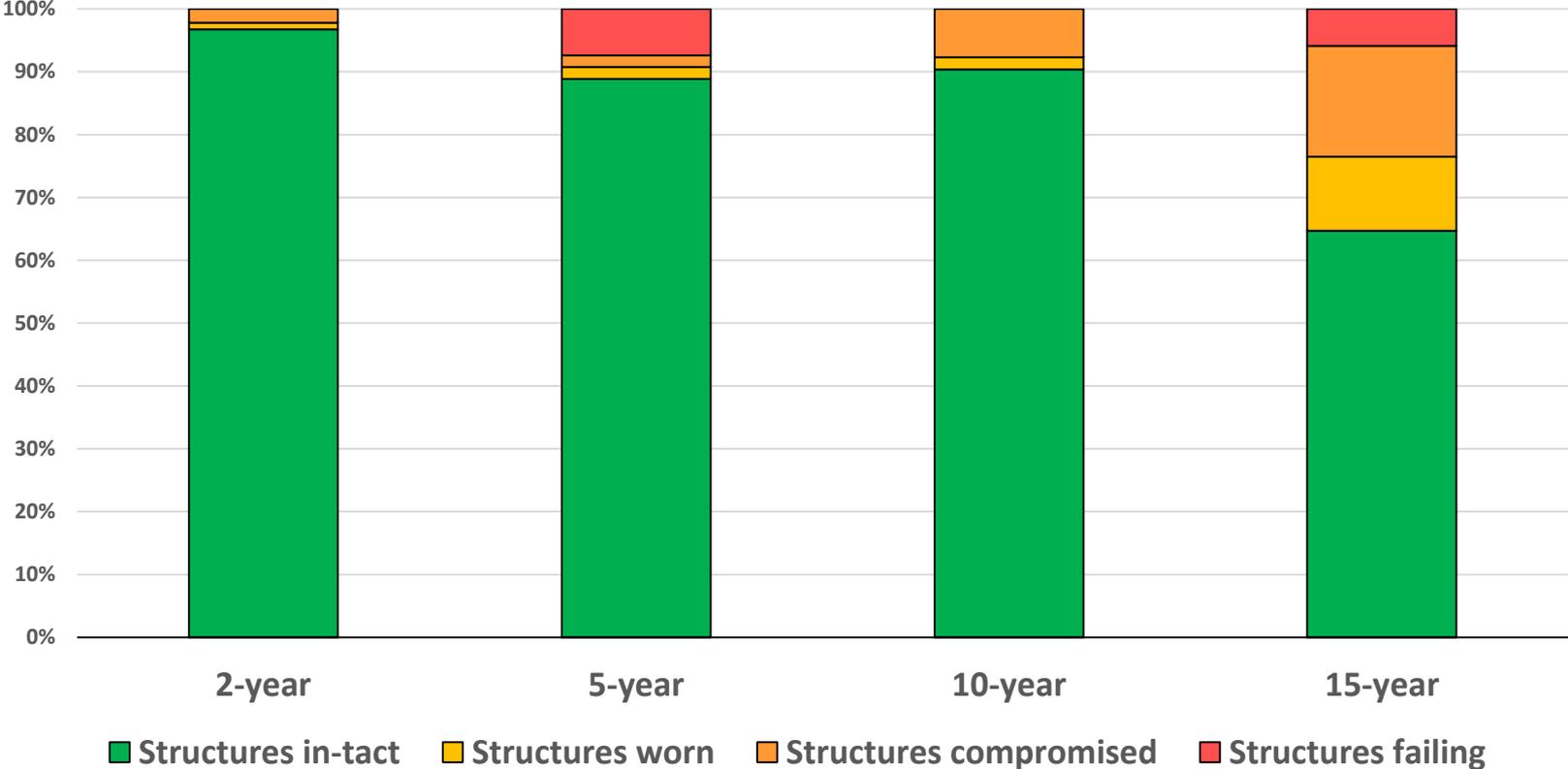
Common Types of BMP Issues



Filtration function by age



Structural integrity by age



Conclusion

- Monitoring summary
- Use results and observations during inspections to refine our guidelines from time to time