

Annual Dane County Yahara WINS Adaptive Management Report



Annual report on Dane County Land & Water Resources Department efforts assisting with the implementation of conservation practices that reduce phosphorus runoff for the Yahara WINS Adaptive Management project.

2019 Report Year



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FIGURE 11.8. TMDL Reach 69 new and carryover pounds of phosphorus reductions by year since 2014.

Executive Summary

The Dane County Land & Water Resources Department (Dane County) continued to assist the Yahara Watershed Improvement Network (WINS) on furthering adaptive management within the Yahara watershed. This included helping rural landowners and producers with the voluntary implementation of conservation practices along with calculating and reporting associated phosphorus reductions. 2019 marked the eighth year of collaboration with continued success even with extraordinarily wet environmental conditions.

Key 2019 Yahara Watershed Accomplishments

- Aided 237 landowners/producers with practice implementation, environmental compliance, and cost-share assistance.
- Conducted planning activities for the implementation of more than 54 conservation practices for 2019 and beyond.
- Implemented 157 new and tracked over 780 conservation practices and systems that reduce phosphorus delivery to nearby surface waters.
- Tracked over 41,500 acres of nutrient management plans within the Yahara watershed.
- Entered into 40 cost-share agreements for conservation practices and systems.
- Allocated all NRCS funding available under the Regional Conservation Partnership Program (RCPP) - Yahara Watershed Grant.
- Reduced and tracked a total (new + carryover) of 23,230 pounds of phosphorus from conservation practices implemented.
- Allocated over \$1.15 million in cost-share assistance within the Yahara watershed.



Participants registering for the Dane County Grazing Workshop (top photo).
Grassed waterway installed to address gully erosion (bottom photo).

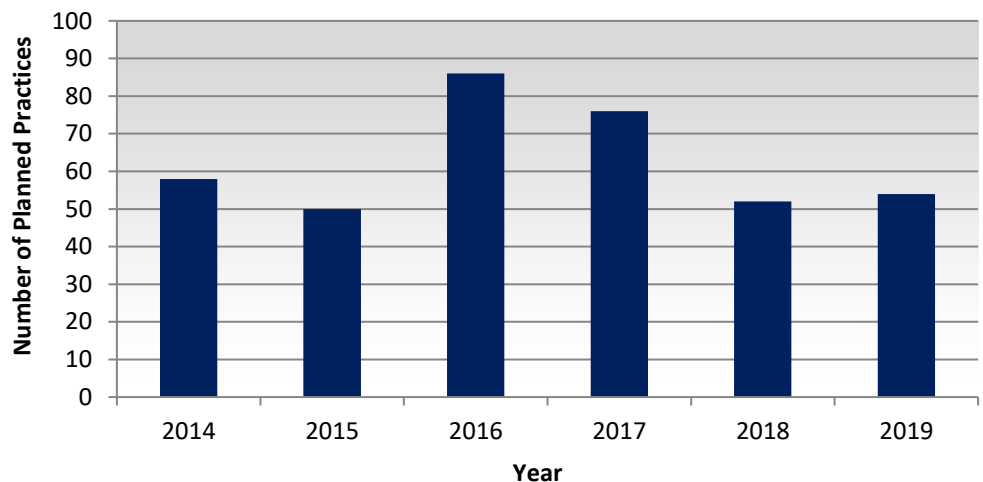
Planning Activities

The excessive rain and flooding of 2018 made conservation implementation challenging if not impossible for many landowners within the Yahara watershed during the fall 2018 construction window. It also led to uncertainty in planning activities for 2019 as landowners were facing both tough agricultural economy and unfavorable field conditions. However, county staff continued to provide planning assistance for more than 50 conservation practices (Figure 1). Many of these planned practices were voluntarily implemented by landowners this past year (see [Practices Implemented](#)). Practices that were not completed are planned for implementation in 2020 and beyond.

Number of Planned Practices

FIGURE 1.

Number of planned conservation practices within the Yahara watershed identified in the Dane County annual work plans submitted to Yahara WINS.



Contacted Landowners and Producers

Landowner and producer contacts are important for conservation implementation. They establish and grow relationships between staff and landowners leading to greater trust. Trust is critical for the continued delivery of services and maintenance of conservation practices and systems.

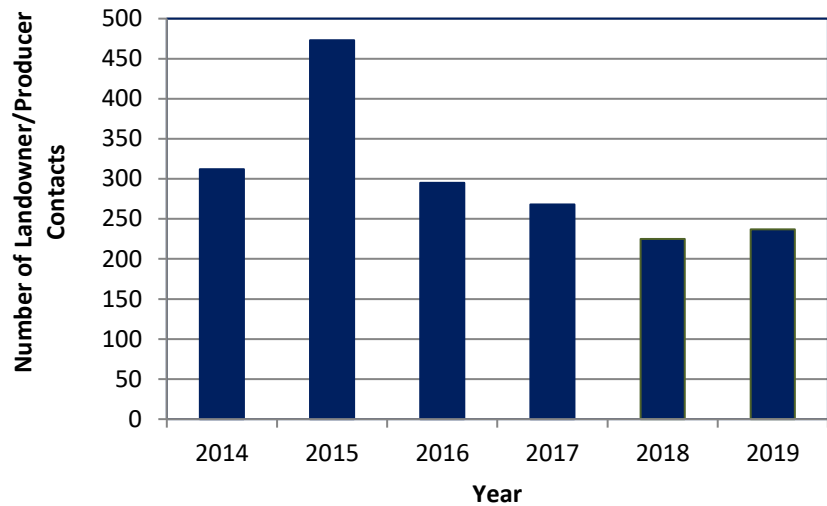
In 2019, Dane County contacted 237 landowners and producers within the Yahara watershed (Figure 2). Services provided include but are not limited to; identifying resource concerns, providing technical and financial assistance for conservation implementation, and verifying compliance with program participation, rules, and ordinances.



Staff discussing continuous cover program options with a producer.

FIGURE 2.

Number of annual landowner/producer contacts since 2014.



2019 Implementation Priorities

Conservation Practices

This past year proved to be another challenging year for conservation implementation. The flooding in 2018 led to many projects being postponed for more favorable weather conditions. The wet spring in 2019 pushed project timelines further back again and staff began planning for what looked to be a busy fall construction season. Unfortunately, the rains continued saturating soils and fields, preventing many crops from being harvested, and postponing projects yet again until 2020.

Even with the challenging weather; more than 40 conservation projects accounted for over 150 practices being implemented and tracked reducing the amount of phosphorus reaching nearby surface waters. This is a slight decrease from 2018 (Figure 3.) but still higher than the number of practices implemented annually between 2014 and 2017. Cover crops comprised the largest proportion of practices implemented with more than 130 fields verified utilizing the practice. Other practices include shallow water development, grazing systems and grassed waterways (Table 1). Dane County is currently monitoring more than 780 conservation practices within the Yahara watershed (Figure 4.).

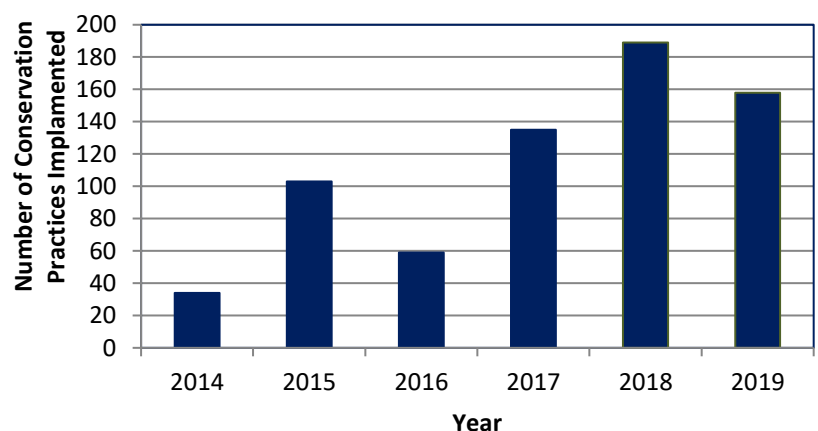


FIGURE 3.

Number of conservation practices implemented in the Yahara watershed since 2014.

TABLE 1.

Amount of conservation practices implemented in the Yahara watershed by TMDL Reach and year since 2014.

TMDL Reach	Practice	Unit	2014	2015	2016	2017	2018	2019	Total Amount Since 2008
62	Cover Crop	Ac	0	25	0	277.7	201	125.9	629.6
	Grade Stabilization Structure	No	0	0	0	0	0	0	1
	Grassed Waterway	Ac	0	0	0	1.0	0	0	3.7
	Pasture and Hay Planting	Ac	0	0	0	0	0	0	5.5
	Roof Runoff Structure	No	1	0	0	0	0	0	1
63	Waste Storage Facility	No	0	0	0	0	0	0	1
	Cover Crop	Ac	0	146.8	126.5	0	0	0	273.3
	Closure of Waste Impound	No	2	0	0	0	0	0	2
	Filter Strip	Ac	7.3	0	0	2.3	0	0	9.6
	Grassed Waterway	Ac	0	1	0	0	0	0	4.8
	Roof Runoff Structure	No	0	0	0	0	0	0	2
	Heavy Use Area Protection	Ac	0	0	0	0	0	0	4.2
	Water and Sediment Control Structure	No	1	0	0	0	0	0	1
	Dane County Perpetual Easement	Ac	0	0	0	0	0	0	3.0
64	Waste Storage Facility	No	0	2	2	0	1	0	8
	Conservation Cover	Ac	0	0	2	0	0	0	2.0
	Cover Crop	Ac	0	256.2	167.9	1672.0	1932.7	1740.1	5768.9
	Critical Area Planting	Ac	4.5	0	0.5	0	0	0	8.1
	Diversion	Ft	0	1350	290	0	0	0	2790.0
	Filter Strip	Ac	3.46	7.3	6.2	0	0	0	18.5
	Grade Stabilization Structure	No	1	1	0	0	0	0	5
	Grassed Waterway	Ac	1.6	4.05	0.25	0.5	0	1	21.4
	Lined Waterway or Outlet	Ft	0	0	606	0	0	0	606.0
	Access Control	Ac	0	0	2.9	0	0	0	2.9
	Pasture and Hay Planting	Ac	0	0	0	0	33.4	0	67.9
	Prescribed Grazing	Ac	0	0	0	0	33.4	0	66.2
	Roof Runoff Structure	No	0	1	0	2	0	0	6
	Heavy Use Area Protection	Ac	0	0.1	0	0	0	0	3.3
	Animal Trails and Walkways	Ft	0	0	331	0	0	0	478.0
	Stream Crossing	No	0	0	1	0	0	0	1
	Streambank and Shoreline	Ft	0	0	0	215	0	0	1525.0
	Manure Transfer	No	0	0	0	0	1	0	5
	Wastewater Treatment Strip	Ac	0	0	0	0	0	0	0.6
	Water and Sediment Control Structure	No	0	1	0	0	0	0	2
	Wetland Restoration	Ac	0	0	0	0	0	0	78.0
	Well Decommissioning	No	0	0	0	1	0	0	1
	Obstruction Removal	Ac	0	0	0	0.1	0	0	0.1
65	Grassed Waterway	Ac	0	0	3.3	0	0	0	3.3

TMDL Reach	Practice	Unit	2014	2015	2016	2017	2018	2019	Total Amount Since 2008
66	Conservation Cover	Ac	3.6	1	0	7.6	0	0	18.5
	Cover Crop	Ac	0	0	0	0	17.4	42.4	59.8
	Sediment Basin	No	0	0	0	1	0	0	1
	Diversion	Ft	0	300	0	1250	0	0	3600.0
	Filter Strip	Ac	0	41.2	11.3	7.4	1.4	0	65.4
	Grassed Waterway	Ac	2.98	4.95	0	6.3	0.7	0	33.2
	Lined Waterway or Outlet	Ft	0	0	0	249	0	0	249.0
	Forage Harvest Management	Ac	0	0	0	0	0	0	45.1
	Pasture and Hay Planting	Ac	0	0	0	25	0	0	33.8
	Roof Runoff Structure	No	0	0	0	1	0	0	1
	Access Road	Ft	0	0	0	785	0	0	785.0
	Heavy Use Area Protection	Ac	0	0	0	0.1	0	0	0.1
	Stream Crossing	No	0	0	0	2	0	0	2.0
	Terrace	Ft	0	0	0	558	0	0	558.0
	Underground Outlet	Ft	0	0	0	250	0	0	250.0
	Wastewater Treatment Strip	Ac	0	0	0	0.17	0	0	0.2
	Tree/Shrub Establishment	Ac	8.2	10.6	0	0	0	0	18.8
	Water and Sediment Control Structure	No	0	0	0	0	0	0	1
	Shallow Water Development	Ac	1.7	0	0	0	0	9.2	10.9
	Wetland Restoration	Ac	0	6	0	0	0	0	9.2
	Pipeline	Ft	0	0	0	0	2280	3070	5350.0
67	Cover Crop	Ac	0	0	0	0	0	196.8	196.8
	Fence	Ft	0	0	0	0	0	4261	4261.0
	Filter Strip	Ac	0	23.2	3.7	2.2	0	0	34.3
	Grassed Waterway	Ac	0.8	0	0	0	0.6	0	2.4
	Pasture and Hay Planting	Ac	0	0	0	0	0	0	4.2
	Pipeline	Ft	0	0	0	0	0	3070	3070.0
	Prescribed Grazing	Ac	0	0	0	0	0	17.5	17.5
	Tree/Shrub Establishment	Ac	4.7	0	0	0	0	0	4.7
68	Cover Crop	Ac	0	0	0	0	239.4	322	561.1
	Grade Stabilization Structure	No	0	0	0	0	0	0	1
	Grassed Waterway	Ac	0	0	0	0	0.9	0	4.7
	Heavy Use Area Protection	Ac	0	0	0	0	0	1	1.0
	Tree/Shrub Establishment	Ac	0	0	0	0	0	0	1.0
	Wetland Restoration	Ac	0	0	0	0	0	0	10.0
	Fence	Ft	0	0	0	0	5244	8400	13644.0
	Filter Strip	Ac	0	0	0	0	4.2	6.7	14.7
	Pipeline	Ft	0	0	0	0	950	0	950.0
	Shallow Water Development	Ac	0	0	0	0	10	0	10.0
69	Conservation Cover	Ac	0	0	24.8	0	0	0	85.3
	Cover Crop	Ac	0	0	0	0	883.17	601	1484.2
	Filter Strip	Ac	4.4	0	0	2.2	24.8	9.3	56.5
	Grassed Waterway	Ac	0.4	1.4	1.2	0	1	0	9.8

	Water and Sediment Control Structure	No	0	1	0	0	0	0	1
	Wetland Wildlife Habitat	Ac	0	0	0	0	0	0	9.6
	Shallow Water Development	Ac	0	0	3.51	0	0	0	3.5

Chapter 49: Agricultural Performance Standards and Manure Management

In March of 2019, Dane County enacted Chapter 49: Agricultural Performance Standards and Manure Management, Dane County Code of Ordinances, with an effective date of July 1, 2019. This ordinance protects both human health and safety while also protecting ground and surface water resources. Chapter 49 replaces the previous ordinance (Chapter 14, Subchapter 1) incorporating current technical standards and state administrative rules addressing agricultural runoff and manure management. More information regarding the ordinance, factsheets, and applications materials are available at: <https://lcd-lwrd.countyofdane.com/Chapter-49>.

Grazing Initiative

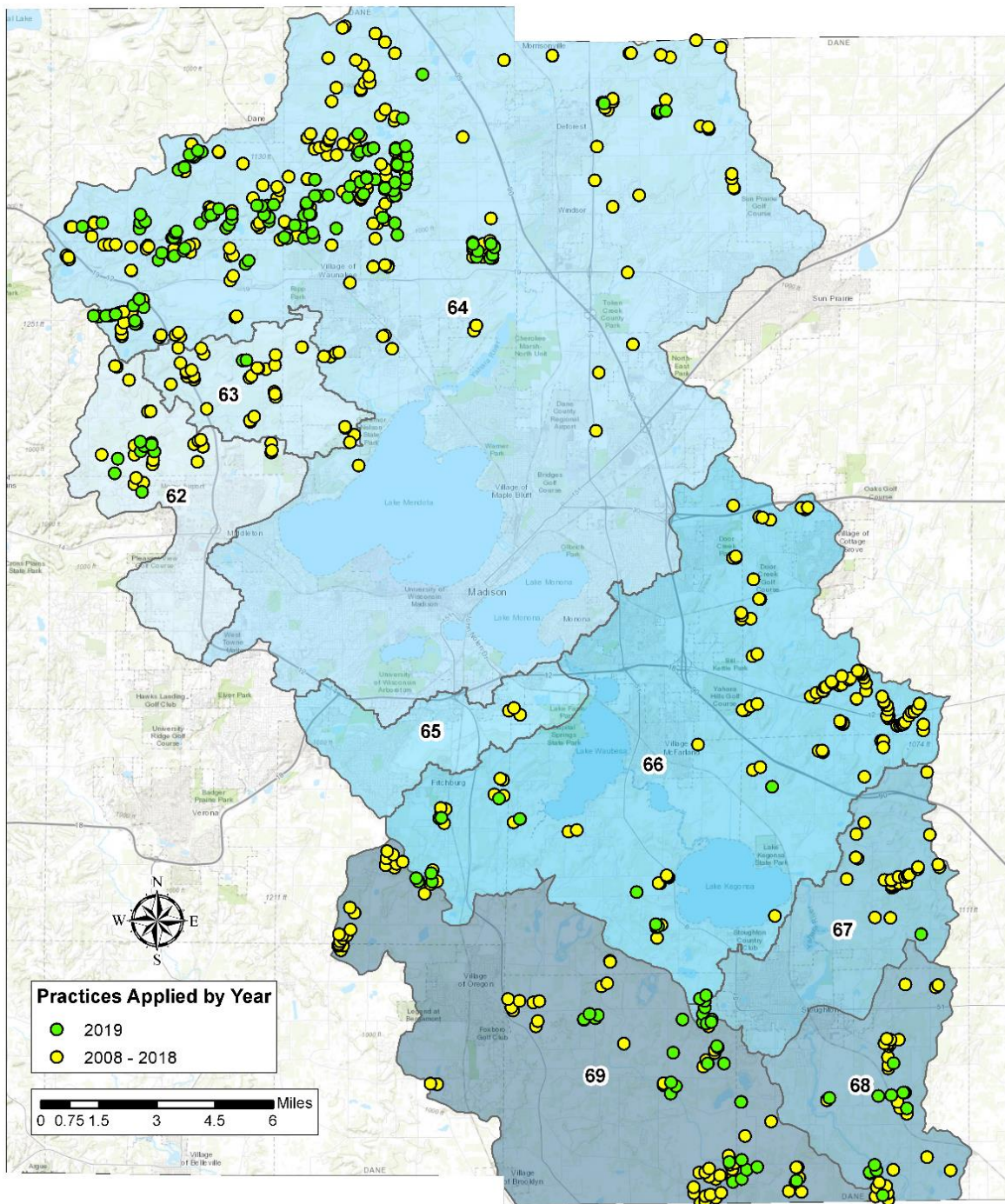
Dane County partnered with five farms this past year to promote the planting and grazing of cover crops within the Yahara Watershed. Benefits from this practice include; reducing livestock feed costs, reducing soil and phosphorus losses, improving soil microbiology, increasing infiltration, and sequestering carbon. More than 330 pounds of phosphorus was calculated to be reduced by those farms participating while also providing wildlife habitat and improving farm profitability. Dane County partnered with the Wisconsin Department of Natural Resources and Glacierland RC&D to hold a field day where area grazing farm managers could come and learn from experts on how to incorporate cover crops into their operations. Over 90 people attended the event hosted by Highland Springs Farm in Fitchburg.



Workshop participants looking at cover crop stands that can be grazed.

FIGURE 4.

Conservation practices implemented in the Yahara watershed since 2008.

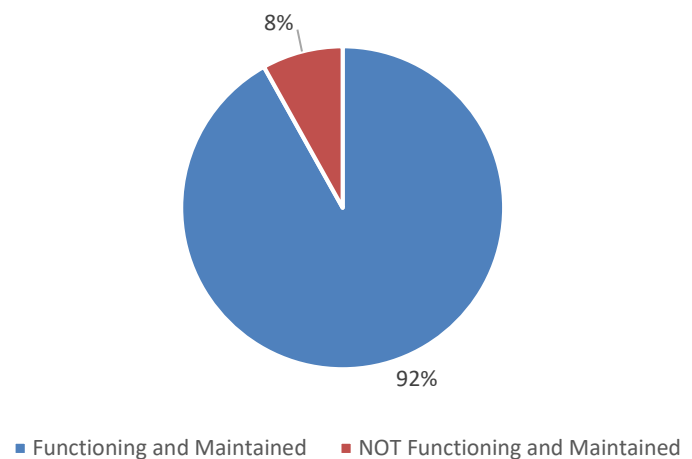


Verification Checks

Of the 44 conservation practices that were identified for verification this past year 37 were able to be inspected. Seven of the practices were inaccessible as a result of wet field conditions and crops still standing. All inspected practices were located in TMDL reaches 63 and 64. Of those checked 34 (92%) were found to be functioning and maintained while three (8%) were not (Figure 5.). Reasons for the three practices no longer functioning and being maintained include conversion of land use from agriculture to residential and the construction of a building.

FIGURE 5.

Field verification and review of conservation practices.



Nutrient Management

Nutrient management plans (NMP) continue to be received, reviewed and mapped by county staff. In 2019, 41,587 total acres were mapped within the Yahara watershed. Of these, 38,441 acres were located in areas that are not internally drained (Figure 6.). Internally drained areas are those areas within the Yahara watershed that are not hydrologically connected to the outlet of the Yahara watershed (Figure 8.) due to impeding landscape features. These areas are important to identify since any phosphorus reducing practices implemented within them will not be counted in the overall phosphorus reductions reported to Yahara WINS. The general location of fields with NMP's are documented in Figure 7. and the total number of acres for each TMDL reach are recorded in Table 2.

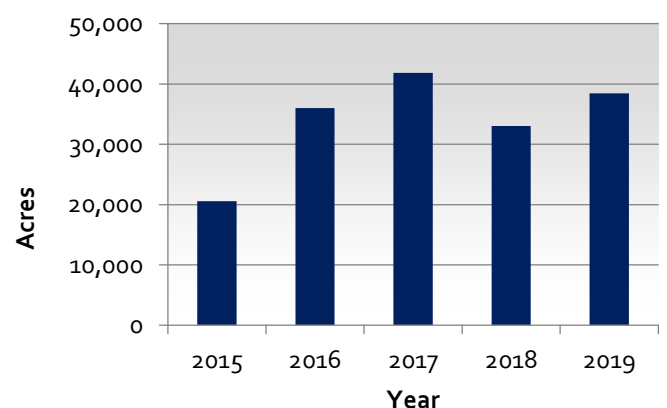


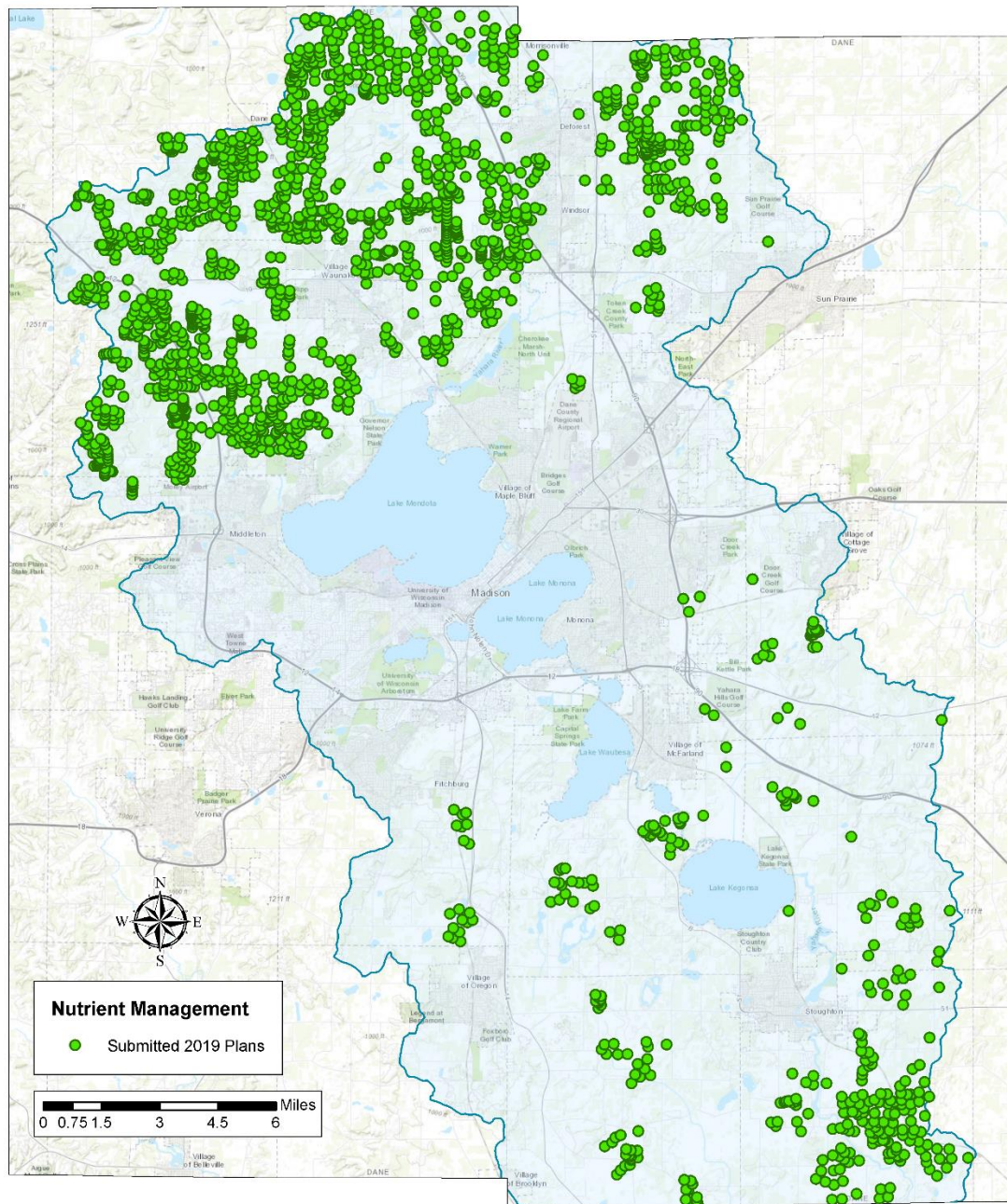
FIGURE 6.

Total acres of nutrient management plans mapped within the Yahara watershed since 2014. Internally drained areas have been removed.

Mapped NMP Acres

FIGURE 7.

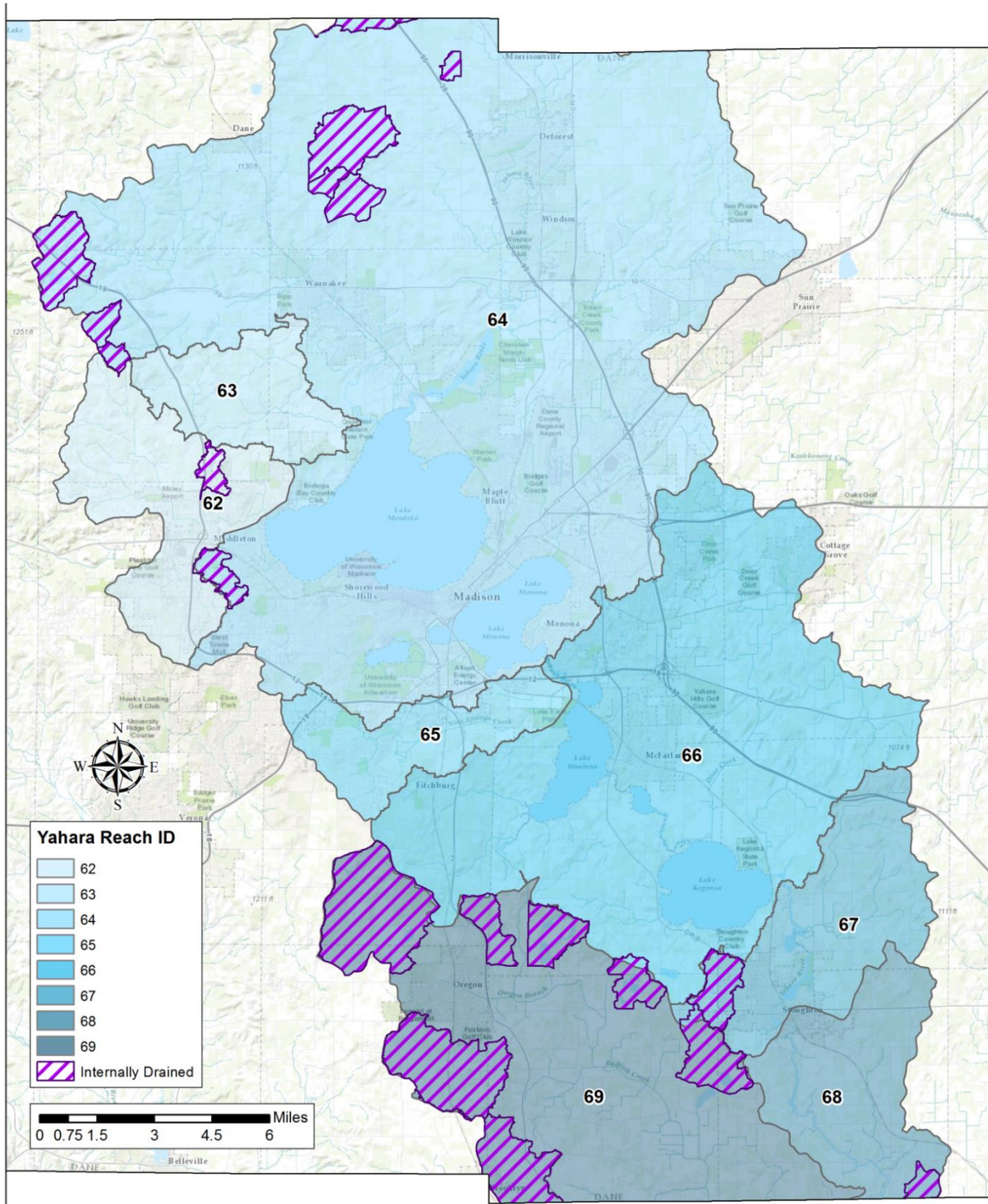
Map of the 2019 submitted nutrient management plans within the Yahara watershed. Fields located in internally drained areas are removed.



Internally Drained Areas

FIGURE 8.

Map of TMDL Reaches and internally drained areas within the Yahara watershed.



Acres of NMP's

TABLE 2.

Acres of nutrient management plans mapped within the Yahara watershed since 2014. Acres located within internally drained areas are removed.

TMDL REACH	2014	2015	2016	2017	2018	2019
62	505	2,077	2,794	2,355	2,663	1,736
63	1,779	3,757	2,112	2,855	2,401	3,299
64	7,833	14,574	23,015	20,696	16,556	25,708
65	0	0	0	203	67	0
66	0	104	2,213	4,453	4,263	1,660
67	37	37	915	1,699	564	809
68	26	26	2,348	4,299	3,198	3,411
69	0	0	2,606	5,278	3,335	1,818
TOTAL	10,180	20,574	36,003	41,838	33,046	38,441

Innovative Conservation Practices


Dane County continued to explore and promote innovative conservation practices and systems in 2019. This included the creation of a new Continuous Cover Program along with further implementation of harvestable buffers and the removal of legacy sediments. All of these practices and systems were implemented while considering both site specific conditions and landowner management goals. This maximizes the amount of phosphorus being reduced while ensuring future maintenance and practice function.

Continuous Cover Program

Dane County launched a **new** conservation program in 2019 called the Continuous Cover Program (CCP). This program provides cost-share assistance to landowners for the establishment and maintenance of a continuous living cover on lands that are traditionally row-cropped. CCP was offered county-wide with more applications received than funds available. A total of nine landowners within the Yahara were selected, enrolling 184 acres into the program for a duration of 15 years. Vegetative establishment will begin in the spring of 2020. More information on the program can be found here:

<https://lcd-lwrd.countyofdane.com/Continuous-Cover-Program>

Continuous Cover Program



Continuous Cover Program (CCP)

This program will allow agricultural producers and landowners to convert land that is currently in an annual crop into a perennial cool-season grass mix, native prairie mix, or grazing mix. Lands that are currently planted in perennial cover may also be eligible for this program to help landowners keep this cover in place. Landowners interested in this program will work with Land & Water Resources Department staff to determine the best strategy for their unique farm operation.

What are the benefits of this program?

- Total upfront payment is between \$1,650 - \$2,500 per acre.
- Establishment payment based on cover (\$150/acre for cool season, \$250/acre for native cover).
- Payment will be based upon an annual rental rate of \$100-\$150/acre (which includes \$25/year for maintenance).
- Retain soil and nutrients and promote infiltration.
- Increase wildlife habitat to support native pollinator populations and beneficial insects.
- Program allows for harvesting and grazing of the cover, providing an added economic and usage benefit.

Eligibility Requirements:

- Eligible cropland includes:
 - Planted to a row crop, history self-certified on application, which will be verified by staff.
 - Previously restored cropland acres.

For more information, please contact:

Land Conservation Division
9400 ZION ST
landcon@countyofdane.com

LAND & WATER
RESOURCES
DEPARTMENT

Legacy Sediment



Hydraulic dredge removing legacy sediments from Token Creek.

This past year marked the completion of the second “full scale” sediment removal project within Token Creek. Approximately 20,000 tons of sediment was hydraulically removed from a one mile long stretch of Dorn Creek.

In addition, Dane County has completed the stream and sediment assessments on 22 of the 33 total miles proposed for the project. A portion of Six Mile Creek has been identified as the next project location with anticipated sediment removal beginning in late fall of 2020 or spring of 2021. More information regarding the Legacy Sediment Removal Project can be found here:

<https://lwr.dane.gov/legacy-sediment-project>

Harvestable Buffers

Harvestable buffers continue to be implemented within the watershed with four additional projects being completed. This resulted in an additional 21 acres of harvestable buffers increasing total acres implemented since 2014 to 153 (Table 3.). This equates to approximately 28 miles of buffered streams. These buffers typically consist of a combination of cool season grasses and legumes established along perennial streams with a minimum width of 30 feet. The purpose of the buffer is to filter and trap phosphorus and sediment laden runoff before it enters the stream.

TABLE 3.

Harvestable buffers implemented within the Yahara watershed by TMDL Reach since 2014.

TMDL REACH	PRACTICE	UNIT	2014	2015	2016	2017	2018	2019	TOTAL AMOUNT
63	HARVESTABLE BUFFER	AC	7.3	0	0	2.3	0	0	9.6
64	HARVESTABLE BUFFER	AC	3.5	0	6.2	0	0	0	9.7
66	HARVESTABLE BUFFER	AC	0	28.9	11.3	7.4	1.4	0	49.0
67	HARVESTABLE BUFFER	AC	0	23.2	1.9	2.2	0	0	27.3
68	HARVESTABLE BUFFER	AC	0	0	0	0	8	10	18.0
69	HARVESTABLE BUFFER	AC	4.4	0	0	2.2	22.2	11	39.8
TOTAL	HARVESTABLE BUFFER	AC	15.2	52.1	19.4	14.1	31.6	21	153.4

Cost-share

Dane County assisted with obligating 40 new cost-share agreements with landowners, utilizing both federal and county funding sources (Figure 9.) within the Yahara. Total cost-share funding for the 40 agreements was over \$1.1 million (Figure 10.). Since 2013, Dane County has assisted with cost-share agreements totaling over \$4.9 million for conservation practices that reduce phosphorus within the watershed. The county strives to utilize and leverage all funding sources available to landowners and producers including federal, state, county, and other sources (i.e. Yahara WINS, Clean Lakes Alliance grants, etc.). Available funds and conditions vary based on the source of funds. Similarly, the number of cost-share agreements executed annually varies, often limited by available annual funding and interest from landowners and producers.

Funding Sources and Amounts

FIGURE 9.

Number of cost-share agreements annually by funding source within the Yahara watershed since 2014.

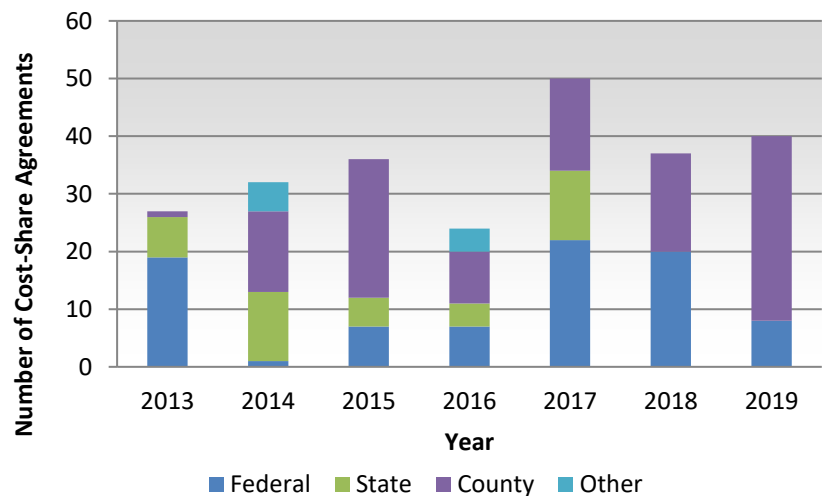
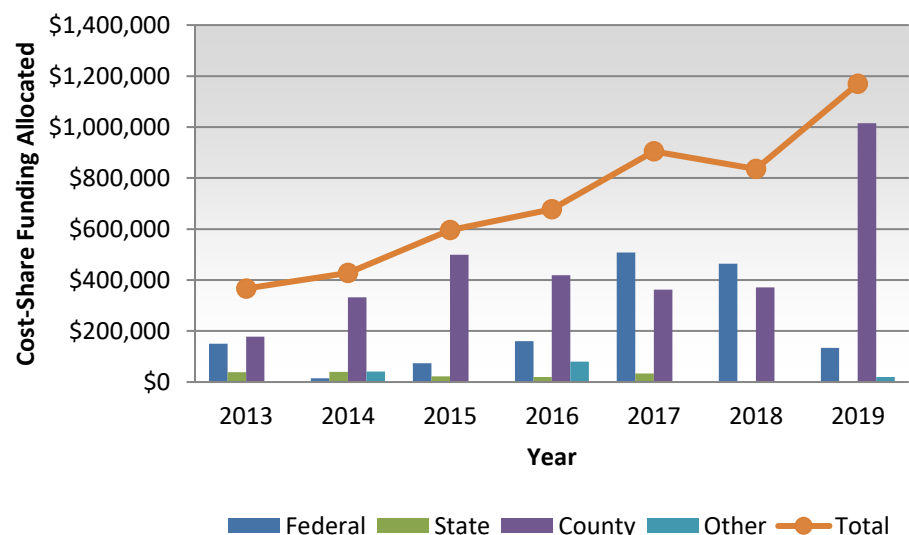


FIGURE 10.

Total cost-share dollars allocated by funding source annually within the Yahara watershed since 2014. The cumulative total from all funding sources is also presented.



Phosphorus Reductions

The pounds of phosphorus reduced in 2019 from new practices was 7,194. With 16,043 carryover pounds, the resulting combined total of 23,237 pounds of phosphorus reduced cap 2019. Carryover pounds are generated from conservation practices implemented from 2008 to 2018 that are still functioning and being maintained. New pounds are from practices implemented in the 2019 calendar year. Phosphorus reductions for the Yahara watershed and subsequent TMDL reaches over time are presented in figures below. Table 4 also shows both new and carryover pounds of phosphorus reduced over time.

New and Carryover Phosphorus Reductions

TABLE 4.

New and carryover pounds of phosphorus reduced by TMDL reach annually.

	2014		2015		2016		2017		2018		2019	
TMDL Reach	New	Carryover	New	Carryover	New	Carryover	New	Carryover	New	Carryover	New	Carryover
62	118.7	390.2	440.4	407.9	558.8	407.9	525.5	438.5	467.3	697.9	299.5	652.8
63	1503	1299.4	957.7	2446.6	548.9	2506.1	341.2	2558.6	240.1	2614.3	329.9	2457.6
64	1934.2	1875.8	3568	2243.4	5355.4	2712.9	3559.5	3348.0	3234.0	5492.7	4325.7	5441
65	0	0	0	0	182.2	0	20.3	0	6.7	0	0	0
66	812.7	906.9	1408.7	1719	733.5	3106.9	1650.5	3381.7	589.7	4586.9	276.4	4561.3
67	205.5	55.8	277.1	253.9	206.9	523.6	171.2	546.2	75.9	547.5	277.7	567
68	5.2	191.4	5.2	191.4	469.6	191.4	429.9	191.4	872.2	168.4	773.8	720.8
69	136.1	124.3	41.1	260.4	586.3	301.5	551.7	300.8	1636.7	339.5	910.5	1642.7

Phosphorus Reductions by Reach

FIGURE 11.1.

TMDL Reach 62 new and carryover pounds of phosphorus reductions by year.

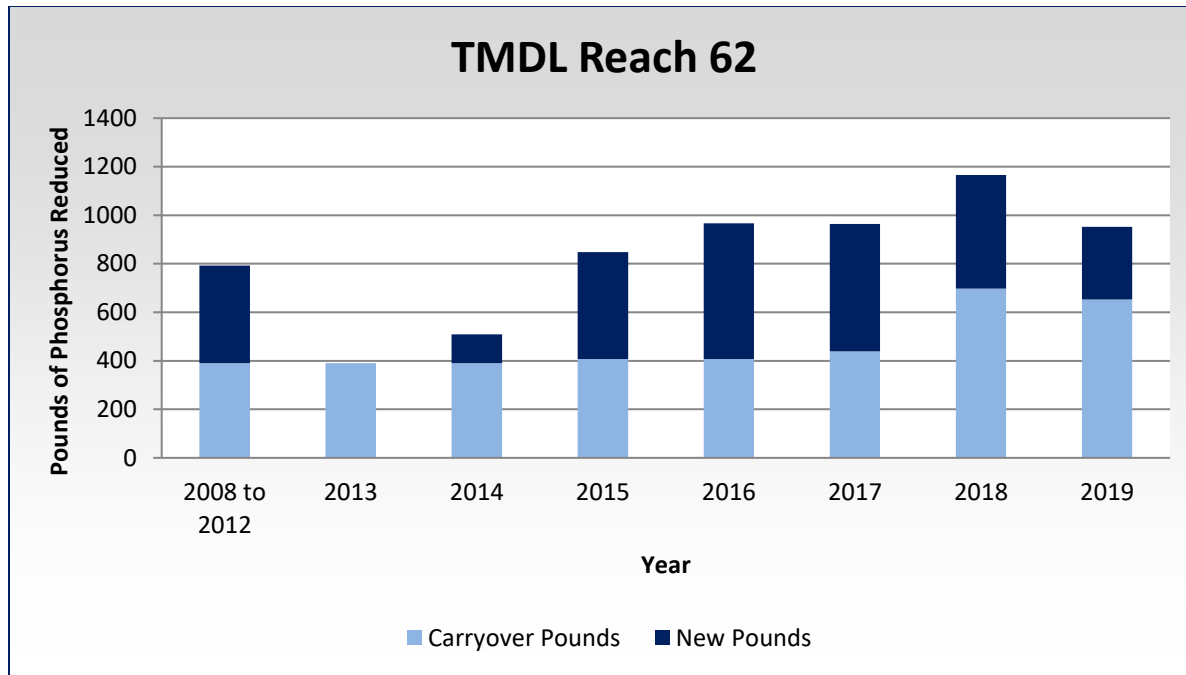


FIGURE 11.2.

TMDL Reach 63 new and carryover pounds of phosphorus reductions by year.

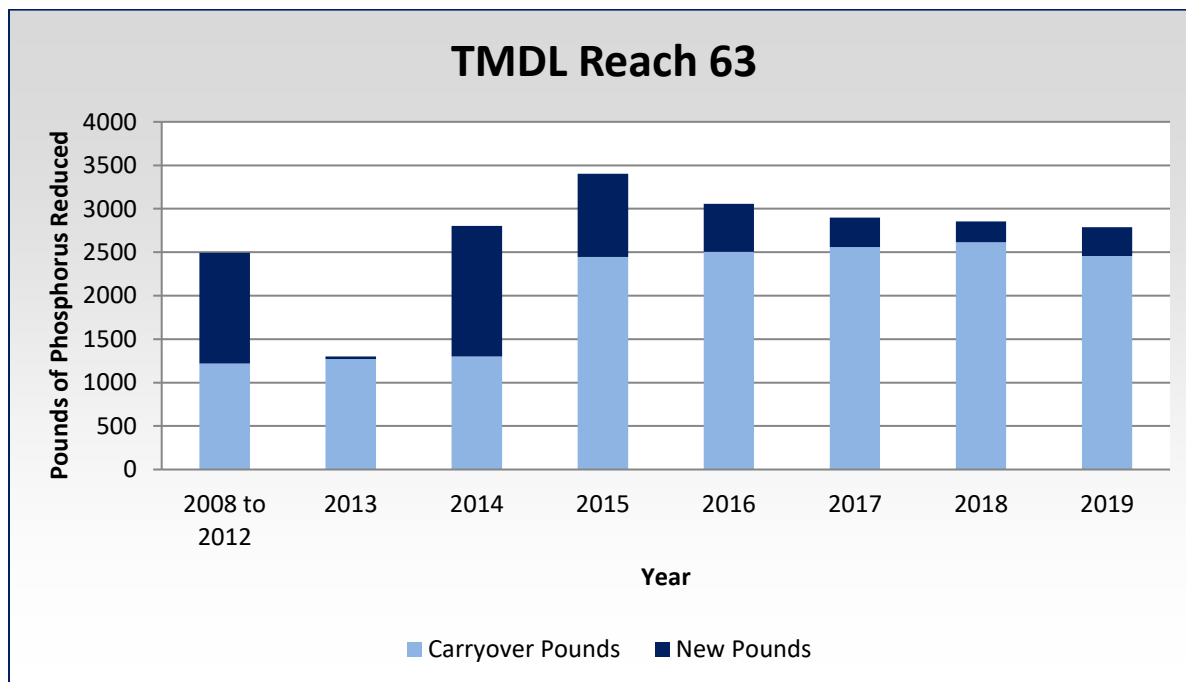


FIGURE 11.3.

TMDL Reach 64 new and carryover pounds of phosphorus reductions by year.

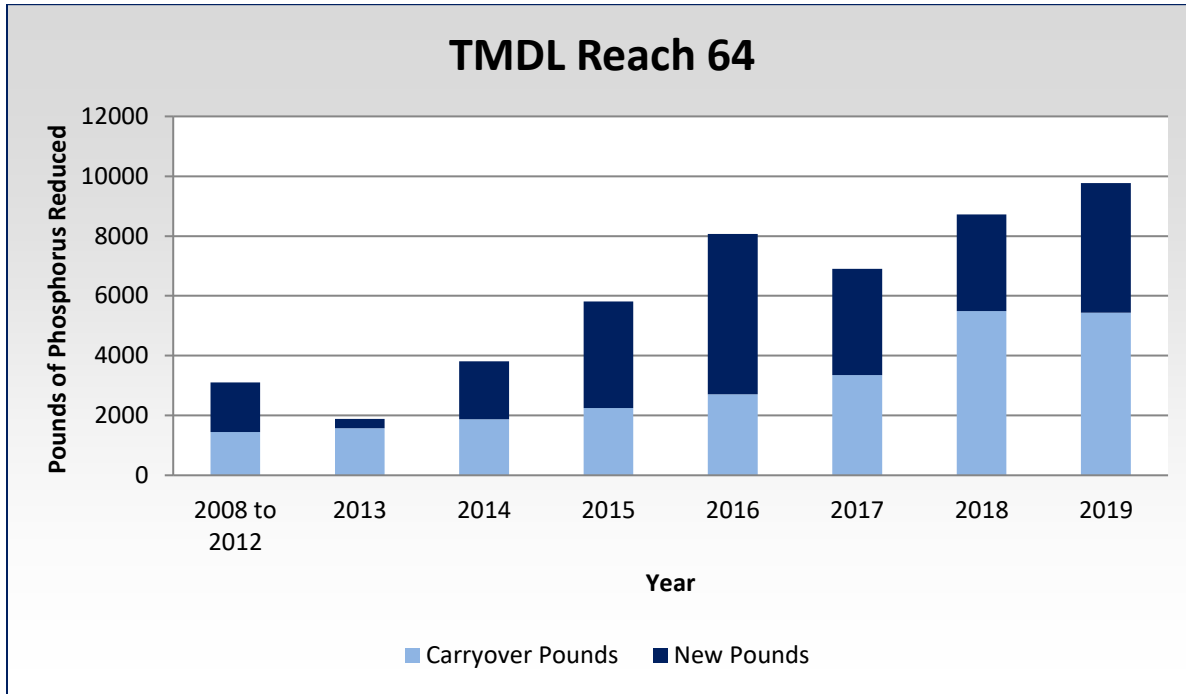


FIGURE 11.4.

TMDL Reach 65 new and carryover pounds of phosphorus reductions by year.

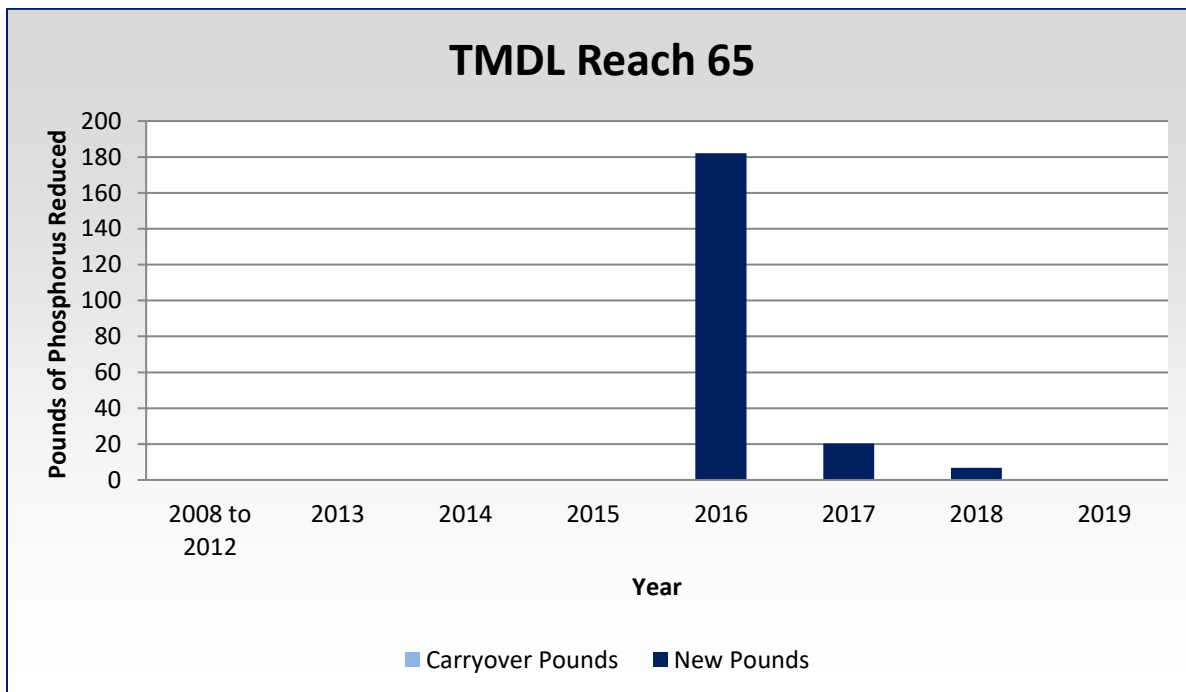


FIGURE 11.5.

TMDL Reach 66 new and carryover pounds of phosphorus reductions by year.

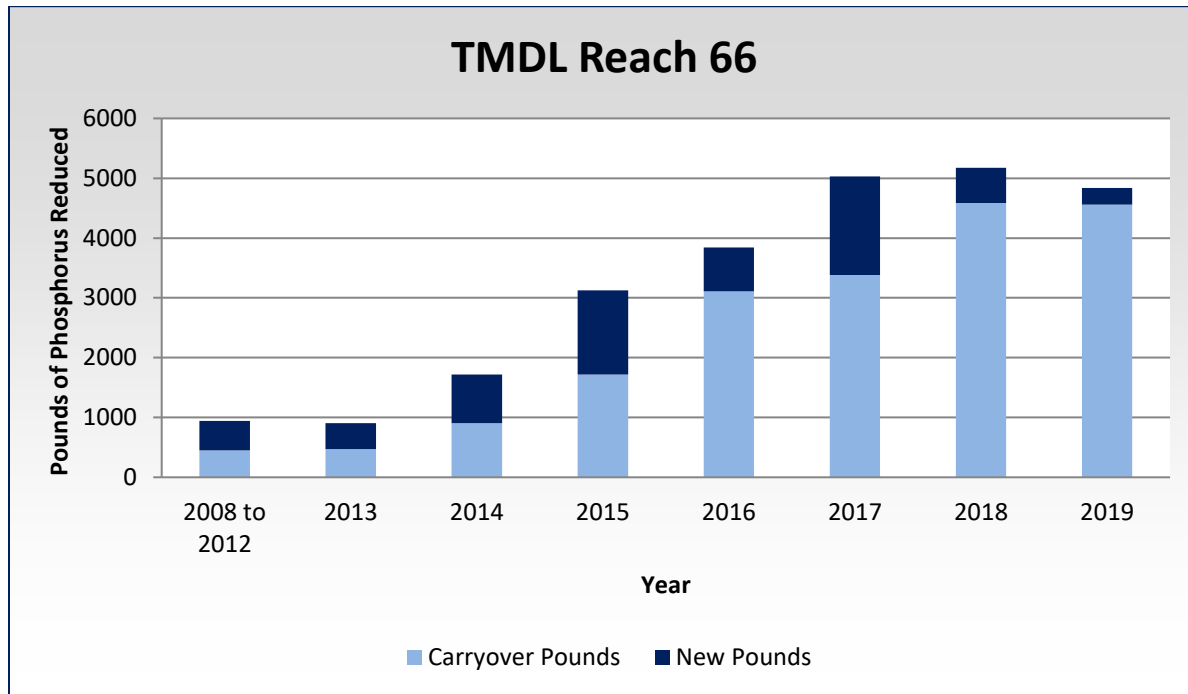


FIGURE 11.6.

TMDL Reach 67 new and carryover pounds of phosphorus reductions by year.

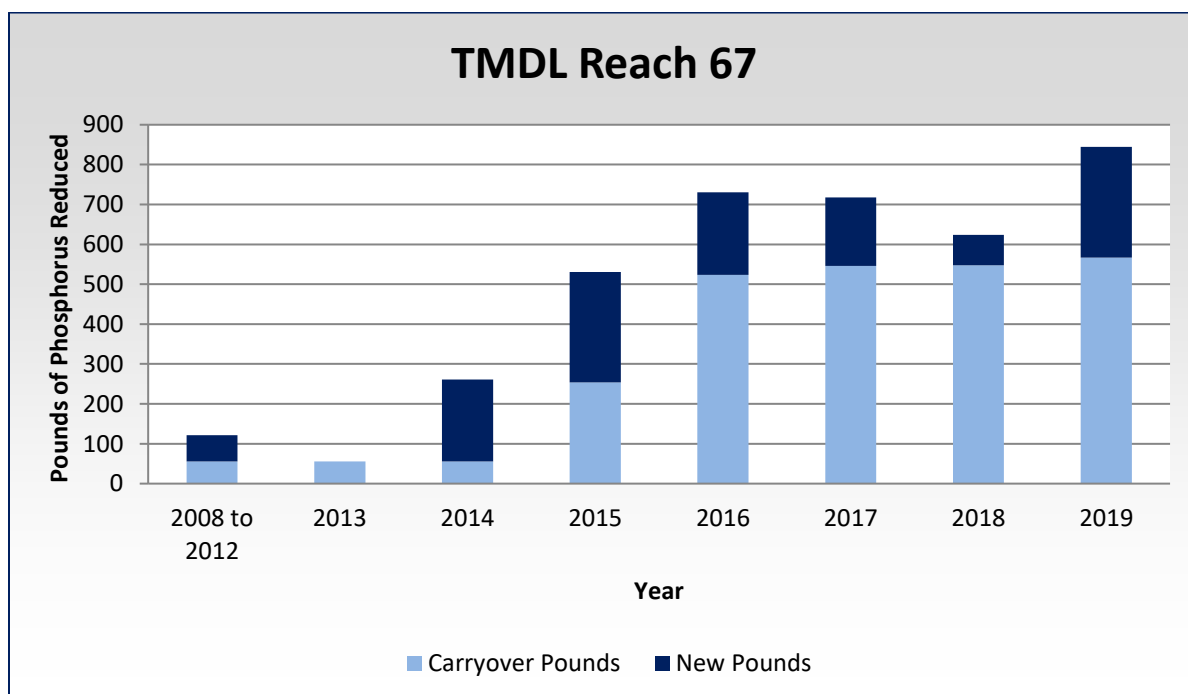


FIGURE 11.7.

TMDL Reach 68 new and carryover pounds of phosphorus reductions by year.

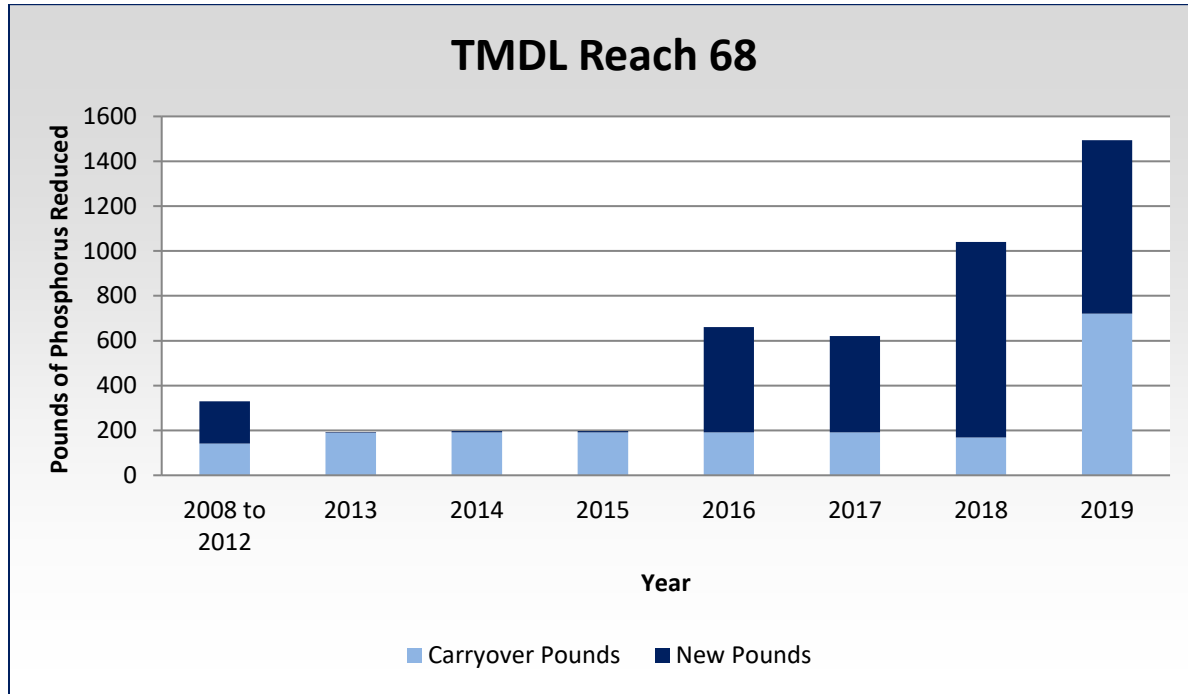
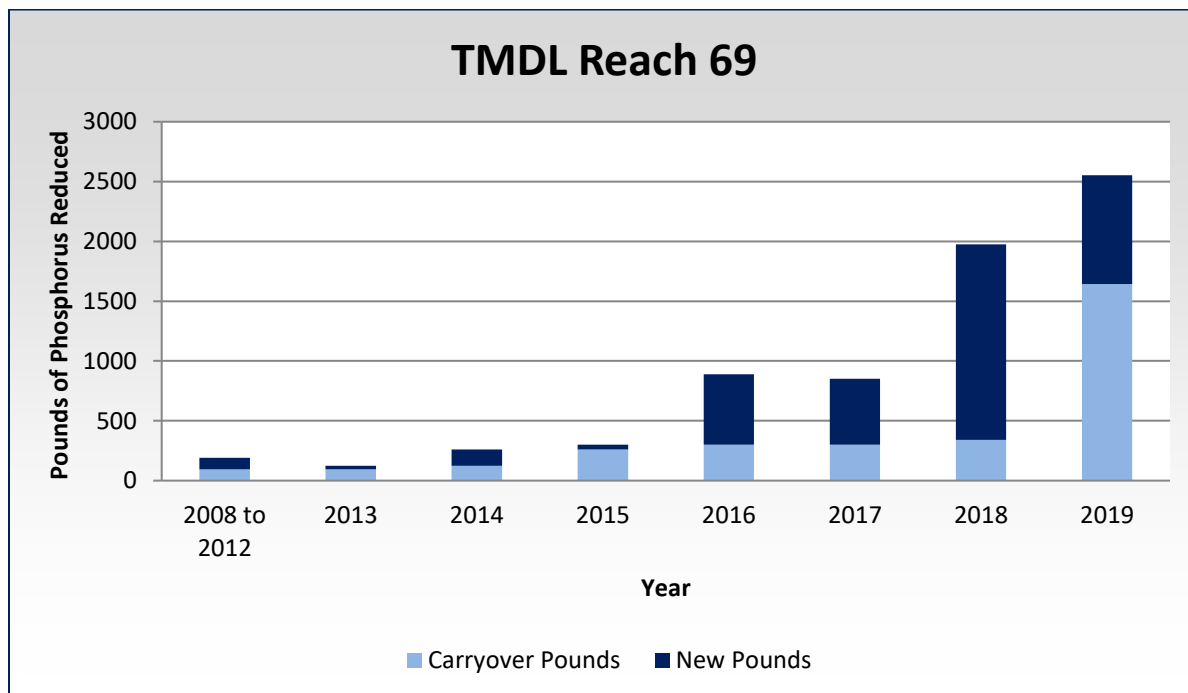


FIGURE 11.8.

TMDL Reach 69 new and carryover pounds of phosphorus reductions by year.



Notable Accomplishments

Pheasant Branch Restoration Project

Dane County purchased a 160 acre property just north of the Pheasant Branch Conservancy in 2019. The property was previously used for livestock agriculture production. The county is partnering with community organizations to plan and implement a native prairie and wetland restoration project on the property. This will help promote infiltration and reduce stormwater volumes while also reducing sediment and phosphorus runoff. Restoration efforts will begin in 2020 with a phased approach occurring over the course of four years.



Permanently Protected Property

An additional 400 acres within the Yahara watershed were permanently protected with the assistance of Dane County and partners. Notable projects include:

- Token Creek County Park and Natural Resource Area – protecting riparian areas adjacent to the stream and wildlife habitat;
- Babcock County Park – improving water flow management and recreational opportunities;
- Floodwater Storage Area in the Town of Vienna – groundwater protection, floodwater storage, wetland and habitat protection;
- Conservation Easement in the Town of Springfield – protection of agricultural land and reductions in sediment and nutrient runoff;
- Six Mile Creek – conservation funding grant in partnership with Groundswell Conservancy.

Reducing Flooding and Improving Water Flow in the Yahara Lakes

Dane County has begun implementation of a multi-year sediment removal project in the Yahara Lakes to remove accumulated sediments and improve water flow. The project is organized into five phases, with each phase carried out as Dane County secures permitting and funding. Timely implementation of these phases is critical to reduce flooding. Several factors were used to determine the locations and order of the five phase plan including

1. Readily available sediment and bathymetry data for developing engineering plans,
2. Contaminated sediments that will impact permitting timelines,
3. Proximity of dewatering locations to let removed sediment dry, and
4. Culturally sensitive features.

More information can be found at <https://lwr.dane-county.gov/flood-facts-and-initiatives>.



Conclusion

The continued partnership between Dane County and Yahara WINS resulted in another successful year of conservation implementation to improve water quality in the Yahara watershed. Despite challenging weather conditions, more than 150 new practices were implemented bringing the total number of practices tracked for phosphorus reductions up to 780. Yahara WINS continued to provide staff funding to aid county resources in assisting landowners and producers with the planning, design, and implementation of practices. This reduced the amount of phosphorus entering nearby surface waters by more than 7,000 pounds. Combining this with the more than 16,000 pounds of phosphorus reduced from previously implemented practices (carryover) resulted in a total reduction of 23,000 pounds of phosphorus in 2019.
