

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.

2020 Report Year



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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 in 2020. This assistance included helping rural landowners and producers with the voluntary implementation of conservation practices along with calculating and reporting associated phosphorus reductions. 2020 marked the ninth year of collaboration with continued success even with the challenges brought on by the global COVID-19 pandemic.

Key 2020 Yahara Watershed Accomplishments

- Aided 215 landowners/producers with practice implementation, environmental compliance, and cost-share assistance.
- Conducted planning activities for the implementation of more than 45 conservation practices for 2020 and beyond.
- Implemented 138 new and tracked over 987 conservation practices and systems that reduce phosphorus delivery to nearby surface waters.
- Tracked nearly 45,000 acres of nutrient management plans within the Yahara watershed.
- Entered into 33 cost-share agreements for conservation practices and systems.
- Allocated all NRCS funding available under the Regional Conservation Partnership Program (RCPP) - Yahara Watershed Grant and continued assisting with implementing contracted practices.
- Reduced and tracked a total (new + carryover) of 20,150 pounds of phosphorus from conservation practices implemented.
- Allocated over \$839,000 in cost-share assistance within the Yahara watershed.



Water and sediment control structure (top photo). Diversion directing water into the water and sediment control structure (bottom photo).

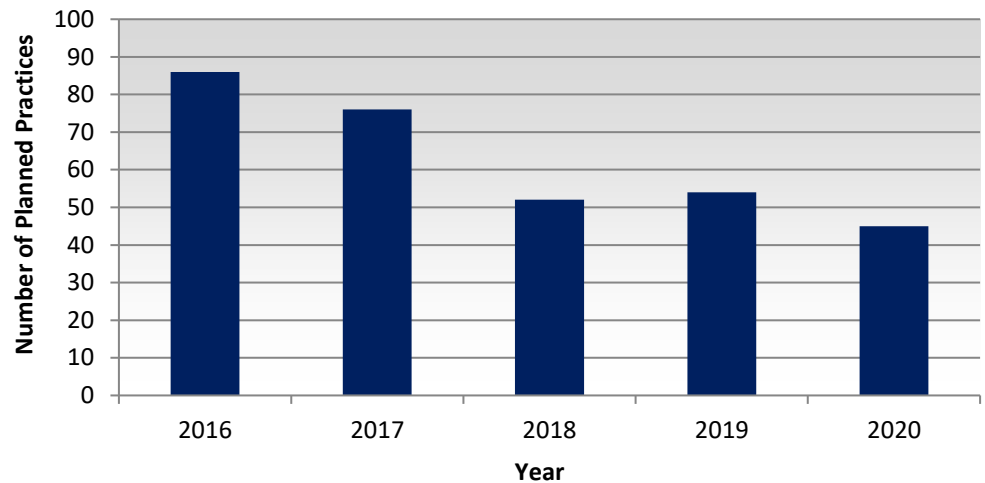
Planning Activities

This past year, 2020, brought with it many new challenges for everyone as the world adapted to the COVID-19 pandemic. Our department was no exception, changes were made to insure that the services we provide to the residents of Dane County could continue in an efficient and safe manner. This includes the assistance we provide to agricultural and rural residents with the implementation of phosphorus reducing conservation practices. Staff adjusted quickly to using remote tools and meeting platforms and were still able to coordinate and meet outside with landowners to aid in implementation. Staff provided planning assistance for more than 45 conservation practices (Figure 1) with many of these planned practices being voluntarily implemented by landowners. Practices that were not completed in 2020 are planned for implementation in 2021 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

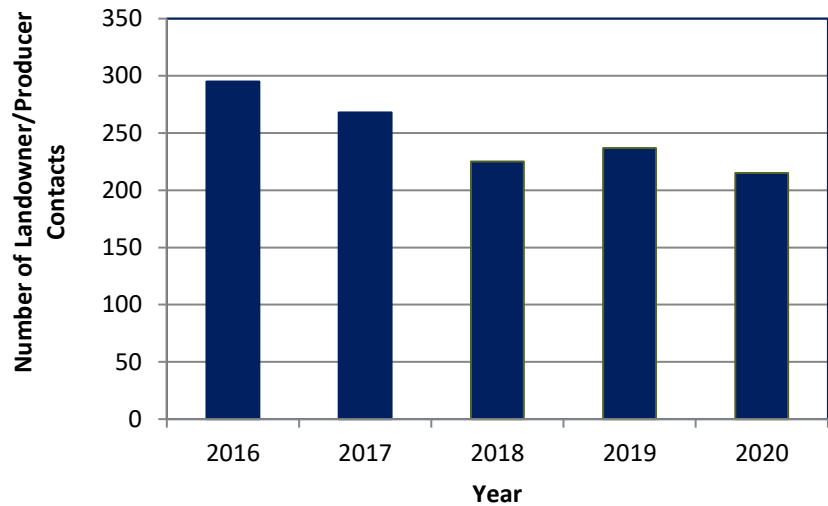
In 2020, Dane County contacted 215 landowners and producers within the Yahara watershed (Figure 2). Services provided include but are not limited to; identifying resource concerns, providing technical and financial assistance for conservation implementation, and verifying compliance with program participation, rules, and ordinances.

Staff discussing conservation practice options with a producer.



FIGURE 2.

Number of annual landowner/producer contacts since 2016.



2020 Implementation Priorities

Conservation Practices

Dane County Land and Water Resources staff assisted landowners and producers with implementing approximately 140 conservation practices in 2020 (Figure 3.). The most common practices were grassed waterways, cover crops, water and sediment control structures, and permanent vegetation establishment. The number of practices in 2020 decreased slightly from 2019. The COVID-19 pandemic and local Health Orders likely played a role in this decrease as staff adjusted to working remotely and socially distancing in late March and April right as the spring construction season was beginning.

The amounts of each conservation practice implemented annually by TMDL reach is available in Table 1. Additionally, Dane County is currently monitoring more than 980 conservation practices within the Yahara watershed (Figure 4.).

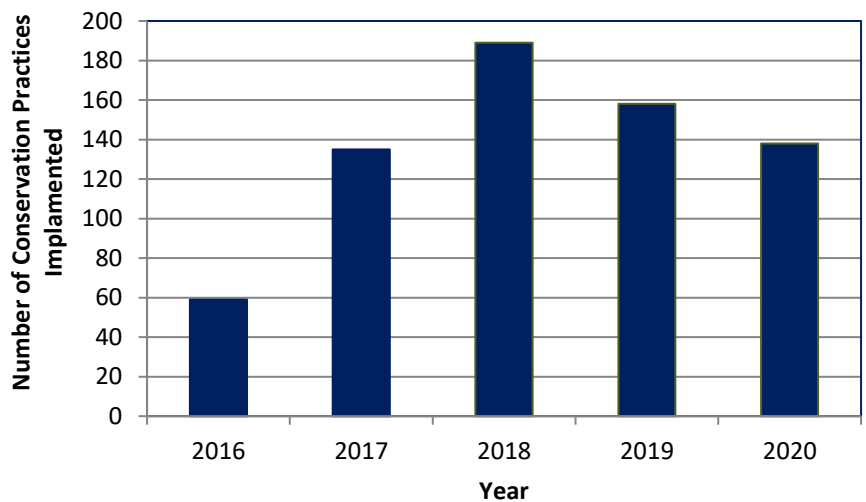


FIGURE 3.

Number of conservation practices implemented in the Yahara watershed since 2016.

TABLE 1.

Amount of conservation practices implemented in the Yahara watershed by TMDL Reach and year since 2008. Practices from 2008 to 2015 are not presented but are reflected in the *Total Amount Since 2008*.

TMDL Reach	Practice	Unit	2016	2017	2018	2019	2020	Total Amount Since 2008
62	Cover Crop	Ac	0.0	277.7	201.0	125.9	0.0	629.6
	Critical Area Planting	Ac	0.0	0.0	0.0	0.0	0.5	0.5
	Diversion	Ft	0.0	0.0	0.0	0.0	264.0	264.0
	Grade Stabilization Structure	No	0.0	0.0	0.0	0.0	0.0	1.0
	Grassed Waterway	Ac	0.0	1.0	0.0	0.0	0.0	3.7
	Pasture and Hay Planting	Ac	0.0	0.0	0.0	0.0	0.0	5.5
	Roof Runoff Structure	No	0.0	0.0	0.0	0.0	0.0	1.0
	Waste Storage Facility	No	0.0	0.0	0.0	0.0	1.0	1.0
63	Closure of Waste Impound	No	0.0	0.0	0.0	0.0	0.0	2.0
	Cover Crop	Ac	126.5	0.0	0.0	0.0	0.0	273.3
	Dane County Perpetual Easement	Ac	0.0	0.0	0.0	0.0	0.0	3.0
	Filter Strip	Ac	0.0	2.3	0.0	0.0	0.0	9.6
	Grassed Waterway	Ac	0.0	0.0	0.0	0.0	0.3	5.1
	Heavy Use Area Protection	Ac	0.0	0.0	0.0	0.0	0.0	4.2
	Roof Runoff Structure	No	0.0	0.0	0.0	0.0	0.0	2.0
	Waste Storage Facility	No	0.0	0.0	0.0	0.0	0.0	1.0
	Water and Sediment Control Structure	No	0.0	0.0	0.0	0.0	0.0	1.0
64	Access Control	Ac	2.9	0.0	0.0	0.0	0.0	2.9
	Animal Trails and Walkways	Ft	331.0	0.0	0.0	0.0	0.0	478.0
	Conservation Cover	Ac	2.0	0.0	0.0	0.0	12.7	14.7
	Cover Crop	Ac	167.9	1672.0	1932.7	1740.1	534.0	6302.9
	Critical Area Planting	Ac	0.5	0.0	0.0	0.0	0.0	8.1
	Diversion	Ft	290.0	0.0	0.0	0.0	0.0	2790.0
	Fence	Ft	0.0	0.0	0.0	420.0	6400.0	6820.0
	Filter Strip	Ac	6.2	0.0	0.0	0.0	0.0	18.5
	Grade Stabilization Structure	No	0.0	0.0	0.0	0.0	0.0	5.0
	Grassed Waterway	Ac	0.3	0.5	0.0	1.0	4.6	27.0
	Heavy Use Area Protection	Ac	0.0	0.0	0.0	0.0	0.0	3.3
	Lined Waterway or Outlet	Ft	606.0	0.0	0.0	0.0	589.0	1195.0
	Lot Relocation or Abandonment	No	0.0	0.0	0.0	0.0	1.0	1.0

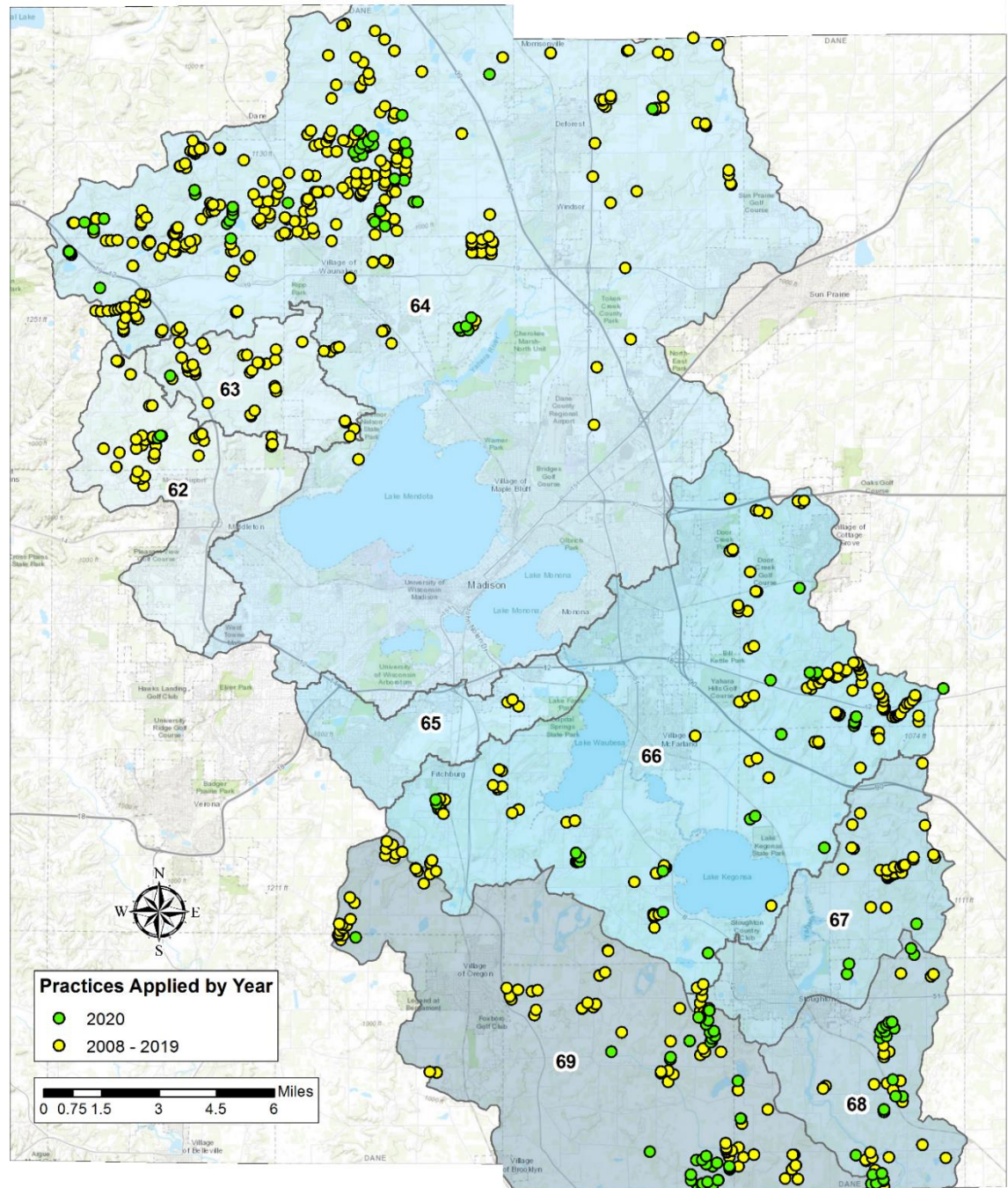
	Manure Transfer	No	0.0	0.0	1.0	0.0	0.0	5.0
	Obstruction Removal	Ac	0.0	0.1	0.0	0.0	0.0	0.1
	Pasture and Hay Planting	Ac	0.0	0.0	33.4	0.0	0.0	67.9
	Prescribed Grazing	Ac	0.0	0.0	33.4	0.0	0.0	66.2
	Roof Runoff Structure	No	0.0	2.0	0.0	0.0	0.0	6.0
	Stream Crossing	No	1.0	0.0	0.0	0.0	1.0	2.0
	Streambank and Shoreline	Ft	0.0	215.0	0.0	0.0	0.0	1525.0
	Subsurface Drain	Ft	0.0	0.0	0.0	0.0	1380.0	1380.0
	Waste Facility Closure	No	0.0	0.0	0.0	0.0	1.0	1.0
	Waste Storage Facility	No	2.0	0.0	1.0	0.0	0.0	8.0
	Wastewater Treatment Strip	Ac	0.0	0.0	0.0	0.0	0.0	0.6
	Water and Sediment Control Structure	No	0.0	0.0	0.0	0.0	0.0	2.0
	Well Decommissioning	No	0.0	1.0	0.0	0.0	0.0	1.0
	Wetland Restoration	Ac	0.0	0.0	0.0	0.0	0.0	78.0
65	Grassed Waterway	Ac	3.3	0.0	0.0	0.0	0.0	3.3
66	Conservation Cover	Ac	0.0	7.6	0.0	0.0	99.7	118.2
	Access Road	Ft	0.0	785.0	0.0	0.0	3826.0	4611.0
	Cover Crop	Ac	0.0	0.0	17.4	42.4	76.7	136.5
	Diversion	Ft	0.0	1250.0	0.0	0.0	700.0	4300.0
	Fence	Ft	0.0	0.0	0.0	0.0	17530.0	17530.0
	Filter Strip	Ac	11.3	7.4	1.4	0.0	0.0	65.4
	Forage and Biomass Planting	Ac	0.0	0.0	0.0	0.0	70.7	70.7
	Forage Harvest Management	Ac	0.0	0.0	0.0	0.0	0.0	45.1
	Grade Stabilization Structure	No	0.0	0.0	0.0	0.0	2.0	2.0
	Grassed Waterway	Ac	0.0	6.3	0.7	0.0	3.3	36.5
	Heavy Use Area Protection	Ac	0.0	0.1	0.0	0.0	0.0	0.1
	Lined Waterway or Outlet	Ft	0.0	249.0	0.0	0.0	0.0	249.0
	Pasture and Hay Planting	Ac	0.0	25.0	0.0	0.0	0.0	33.8
	Pipeline	Ft	0.0	0.0	2280.0	3070.0	980.0	6330.0
	Prescribed Grazing	Ac	0.0	0.0	0.0	0.0	24.6	24.6
	Roof Runoff Structure	No	0.0	1.0	0.0	0.0	0.0	1.0
	Sediment Basin	No	0.0	1.0	0.0	0.0	0.0	1.0
	Shallow Water Development	Ac	0.0	0.0	0.0	9.2	0.0	10.9
	Stream Crossing	No	0.0	2.0	0.0	0.0	2.0	4.0

	Terrace	Ft	0.0	558.0	0.0	0.0	0.0	558.0
	Tree/Shrub Establishment	Ac	0.0	0.0	0.0	0.0	0.0	18.8
	Underground Outlet	Ft	0.0	250.0	0.0	0.0	0.0	250.0
	Wastewater Treatment Strip	Ac	0.0	0.2	0.0	0.0	0.0	0.2
	Water and Sediment Control Structure	No	0.0	0.0	0.0	0.0	0.0	1.0
	Watering Facility	No	0.0	0.0	0.0	0.0	1.0	1.0
	Wetland Restoration	Ac	0.0	0.0	0.0	0.0	0.0	9.2
67	Cover Crop	Ac	0.0	0.0	0.0	196.8	196.7	393.5
	Fence	Ft	0.0	0.0	0.0	4261.0	0.0	4261.0
	Filter Strip	Ac	3.7	2.2	0.0	0.0	0.0	34.3
	Grassed Waterway	Ac	0.0	0.0	0.6	0.0	0.0	2.4
	Pasture and Hay Planting	Ac	0.0	0.0	0.0	0.0	0.0	4.2
	Pipeline	Ft	0.0	0.0	0.0	3070.0	0.0	3070.0
	Prescribed Grazing	Ac	0.0	0.0	0.0	17.5	39.7	57.2
	Tree/Shrub Establishment	Ac	0.0	0.0	0.0	0.0	0.0	4.7
68	Cover Crop	Ac	0.0	0.0	239.4	321.7	352.3	913.4
	Fence	Ft	0.0	0.0	5244.0	8400.0	13700.0	27344.0
	Filter Strip	Ac	0.0	0.0	8.0	6.7	0.0	14.7
	Grade Stabilization Structure	No	0.0	0.0	0.0	0.0	0.0	1.0
	Grassed Waterway	Ac	0.0	0.0	0.9	0.0	0.6	5.3
	Heavy Use Area Protection	Ac	0.0	0.0	0.0	1.0	0.0	1.0
	Pipeline	Ft	0.0	0.0	950.0	0.0	4900.0	5850.0
	Prescribed Grazing	Ac	0.0	0.0	0.0	0.0	39.2	39.2
	Shallow Water Development	Ac	0.0	0.0	10.0	0.0	0.0	10.0
	Tree/Shrub Establishment	Ac	0.0	0.0	0.0	0.0	0.0	1.0
	Wetland Restoration	Ac	0.0	0.0	0.0	0.0	0.0	10.0
69	Conservation Cover	Ac	24.8	0.0	0.0	0.0	38.9	124.2
	Cover Crop	Ac	0.0	0.0	883.2	601.1	430.3	1914.5
	Critical Area Planting	Ac	0.0	0.0	0.0	0.0	25.6	25.6
	Fence	Ft	0.0	0.0	0.0	0.0	8050.0	8050.0
	Filter Strip	Ac	0.0	2.2	24.8	9.3	0.0	56.5
	Forage and Biomass Planting	Ac	0.0	0.0	0.0	0.0	22.0	22.0
	Grassed Waterway	Ac	1.2	0.0	1.0	0.0	0.0	9.8
	Pipeline	Ft	0.0	0.0	0.0	0.0	3000.0	3000.0
	Roof Runoff Structure	No	0.0	0.0	0.0	0.0	2.0	2.0

Shallow Water Development	Ac	3.5	0.0	0.0	0.0	0.0	3.5
Waste Facility Closure	No	0.0	0.0	0.0	0.0	1.0	1.0
Water and Sediment Control Structure	No	0.0	0.0	0.0	0.0	0.0	1.0
Wetland Restoration	Ac	0.0	0.0	0.0	0.0	2.0	2.0
Wetland Wildlife Habitat	Ac	0.0	0.0	0.0	0.0	0.0	9.6

FIGURE 4.

Conservation practices implemented in the Yahara watershed since 2008.

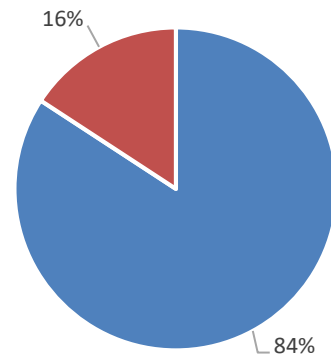


Verification Checks

Of the 41 conservation practices that were identified for verification this past year 19 were inspected. The other 22 practices were previously inspected within the past four years. All inspected practices were located in TMDL reaches 63 and 64. Of those checked 16 (84%) were found to be functioning and maintained while three (16%) were not (Figure 5.).

FIGURE 5.

Field verification and review of conservation practices.



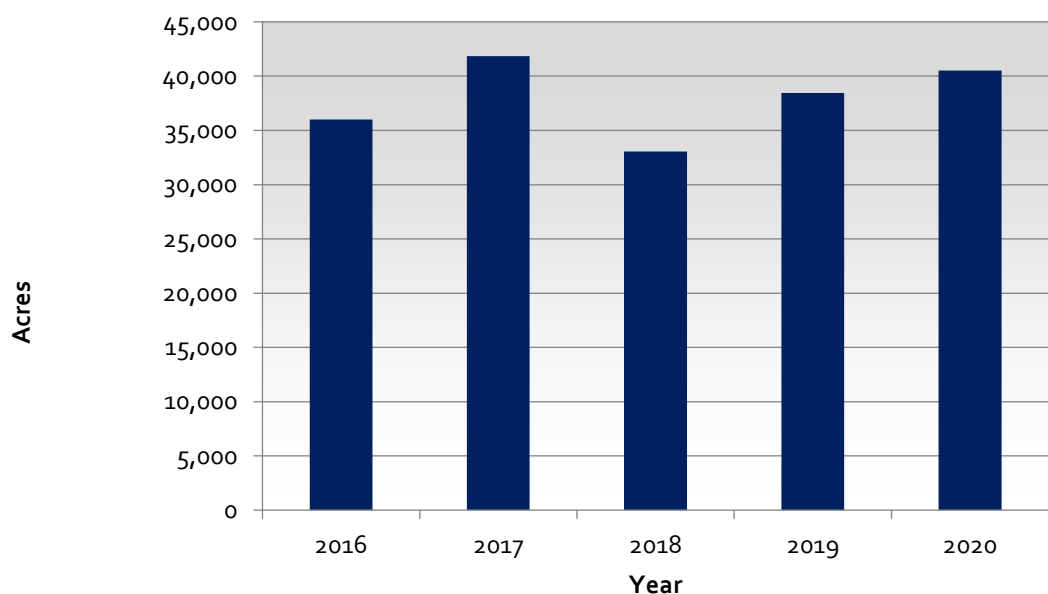
■ Functioning and Maintained ■ NOT Functioning and Maintained

Nutrient Management

Nutrient management plans (NMP) continue to be received, reviewed and mapped by county staff. In 2020, 44,992 total acres were mapped within the Yahara watershed. Of these, 40,516 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 shown in Figure 7 and the total number of acres for each TMDL reach are listed in Table 2.

FIGURE 6.

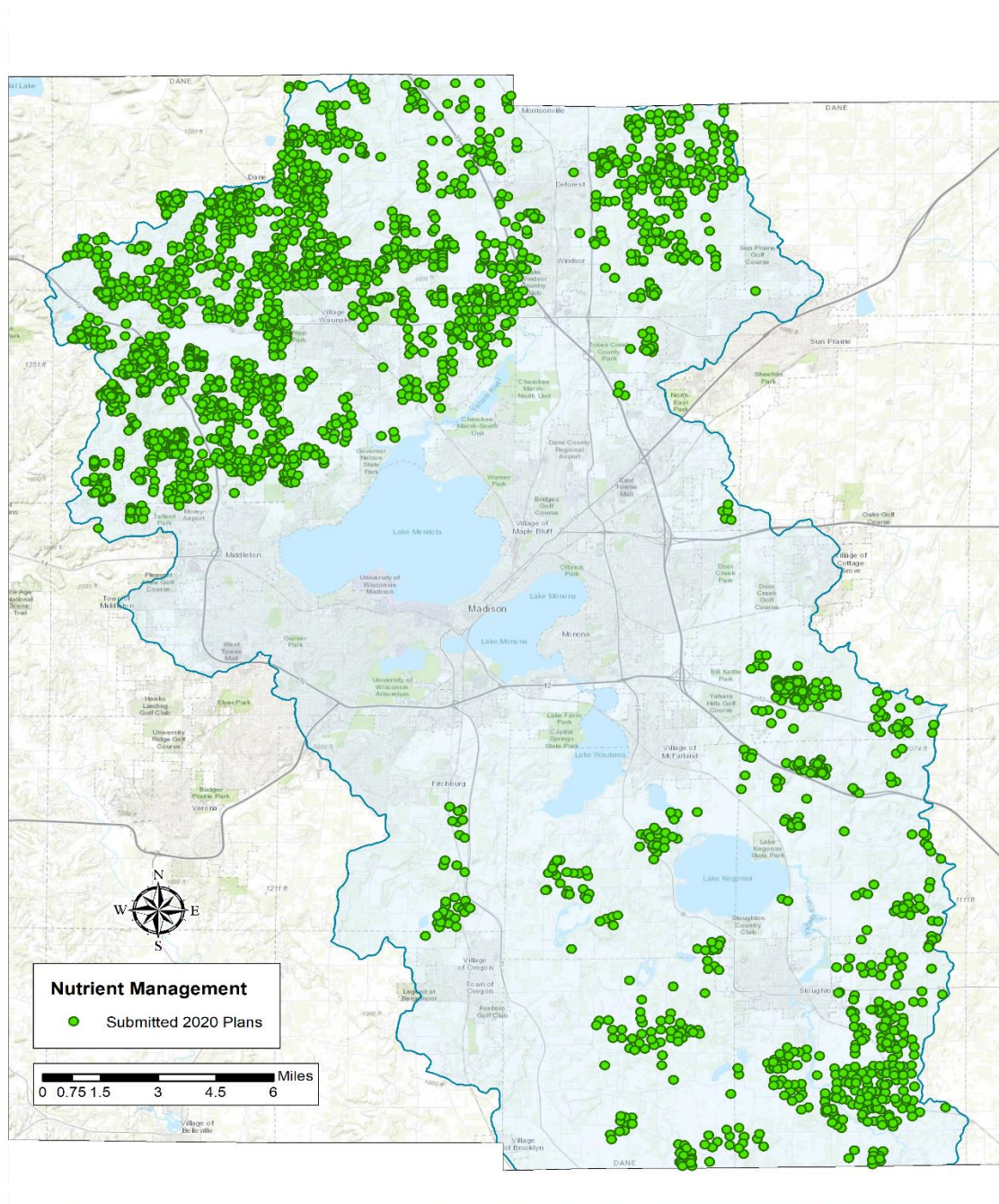
Total acres of nutrient management plans mapped within the Yahara watershed since 2016. Internally drained areas have been removed.



Mapped NMP Acres

FIGURE 7.

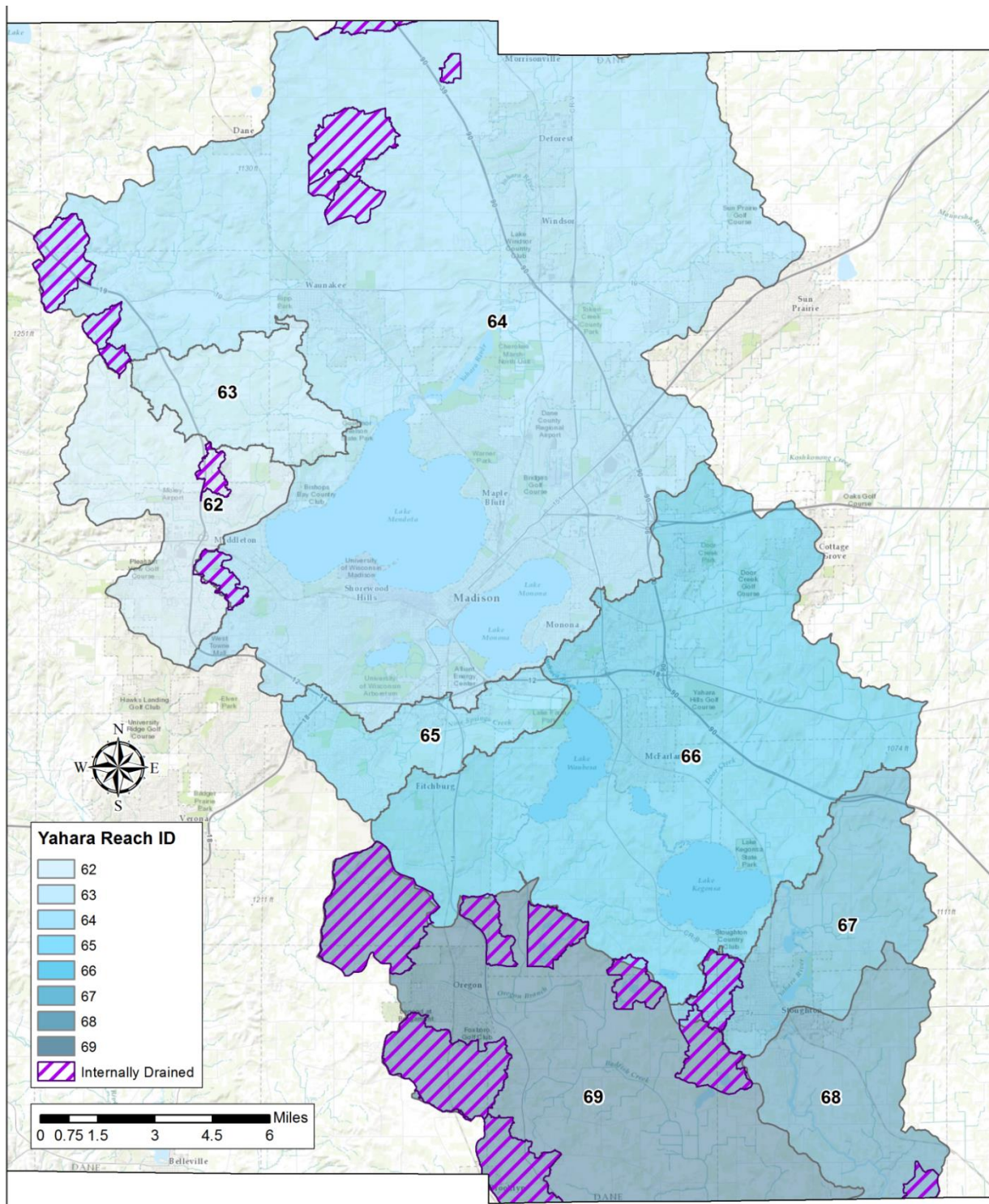
Map of the 2020 submitted nutrient management plans within the Yahara watershed. Fields located in internally drained areas are removed.



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 2016. Acres located within internally drained areas are removed.

TMDL REACH	2016	2017	2018	2019	2020
62	2,794	2,355	2,663	1,736	2,021
63	2,112	2,855	2,401	3,299	2,955
64	23,015	20,696	16,556	25,708	24,082
65	0	203	67	0	0
66	2,213	4,453	4,263	1,660	3,451
67	915	1,699	564	809	884
68	2,348	4,299	3,198	3,411	4,277
69	2,606	5,278	3,335	1,818	2,846
TOTAL	36,003	41,838	33,046	38,441	40,516

Innovative Conservation Practices

Continuous Cover Program

The Continuous Cover Program (CCP) was in its second year of availability to landowners in Dane County. The program provides funding to assist landowners in converting and maintaining continuous vegetative cover on agricultural lands. Benefits include increased water infiltration, reduced soil erosion, improved water quality, improved soil health, enhanced wildlife habitat, and increased carbon sequestration. Thirty one landowners enrolled in the program in 2020 (six within the Yahara) protecting 600 acres in permanent vegetation. \$1.5 million in funding was made available this past year. More information on the program can be found here: <https://lwr.dane-county.gov/what-we-do/agriculture/agricultural-conservation-programs/ccp>



Cattle grazing a field enrolled in the Dane County Continuous Cover program.

Nutrient Concentration System

Dane County Executive Joe Parisi joined representatives from AQUA Innovations and GL Dairy Biogas LLC in 2020 to open a new community nutrient concentration system (NCS) in the Town of Springfield. The system received manure from GL Dairy Biogas LLC and cleans it through a series of ultrafiltration and reverse osmosis filters before discharging clean water into Pheasant Branch. Nutrients, including phosphorus, are removed from the manure, concentrated, and stored for later use as a fertilizer for growing crops. This new nutrient concentration system achieved nearly 100% phosphorus removal – meaning less phosphorus in manure and digester byproduct spread on fields sensitive to runoff in the Yahara Watershed.



Samples of processed manure through NCS. Raw manure is on the left. Clean water is on the right.

Cost-share

Dane County assisted with obligating 33 new cost-share agreements with landowners in the Yahara watershed in 2020 (Figure 9.). Total cost-share funding for the 33 agreements was over \$830,000 (Figure 10.). Since 2013, Dane County has assisted with cost-share agreements totaling over \$5.8 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 2016.

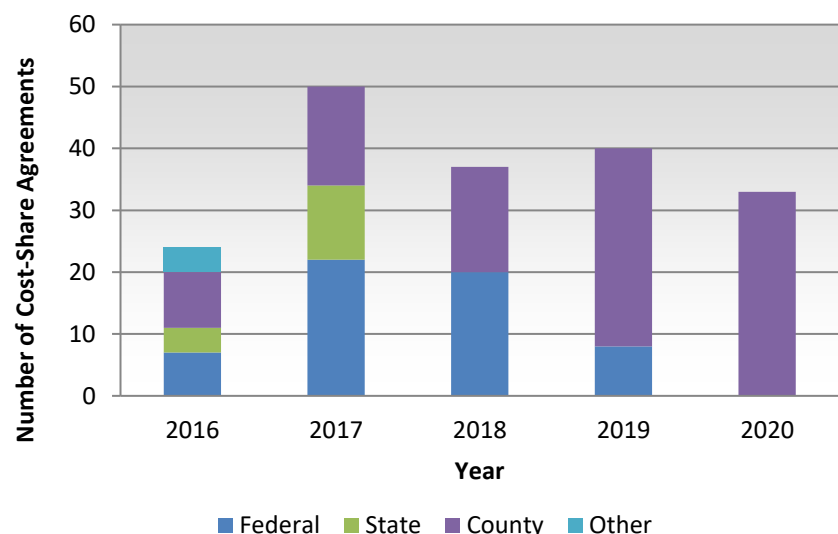
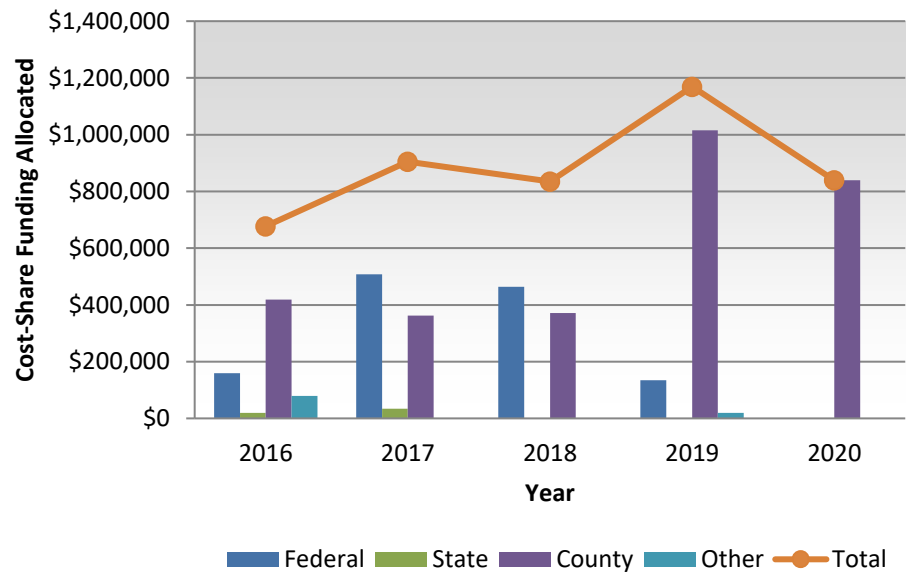


FIGURE 10.

Total cost-share dollars allocated by funding source annually within the Yahara watershed since 2016. The cumulative total from all funding sources is also presented.



Phosphorus Reductions

The amount of phosphorus reduced in 2020 from new practices was 6,761 pounds. An additional 13,390

carryover pounds was reduced resulting in a combined total of 20,150 pounds of phosphorus. Carryover pounds are generated from conservation practices implemented from 2008 to 2019 that are still functioning and being maintained. New pounds are from practices implemented in the 2020 calendar year. Phosphorus reductions for the Yahara watershed and subsequent TMDL reaches over time are presented in figures below. Table 3 also shows both new and carryover pounds of phosphorus reduced over time.

New and Carryover Phosphorus Reductions

TABLE 3.

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

	2015		2016		2017		2018		2019		2020	
TMDL Reach	New	Carryover	New	Carryover	New	Carryover	New	Carryover	New	Carryover	New	Carryover
62	440.4	407.9	558.8	407.9	525.5	438.5	467.3	697.9	299.5	652.8	203.6	342.4
63	957.7	2446.6	548.9	2506.1	341.2	2558.6	240.1	2614.3	329.9	2457.6	328.4	1529.4
64	3568	2243.4	5355.4	2712.9	3559.5	3348.0	3234.0	5492.7	4325.7	5441	3033.7	4260.2

	2015		2016		2017		2018		2019		2020	
TMDL Reach	New	Carryover	New	Carryover	New	Carryover	New	Carryover	New	Carryover	New	Carryover
65	0	0	182.2	0	20.3	0	6.7	0	0	0	0.0	145.6
66	1408.7	1719	733.5	3106.9	1650.5	3381.7	589.7	4586.9	276.4	4561.3	1268.3	4587.6
67	277.1	253.9	206.9	523.6	171.2	546.2	75.9	547.5	277.7	567	285.1	567.0
68	5.2	191.4	469.6	191.4	429.9	191.4	872.2	168.4	773.8	720.8	904.7	710.0
69	41.1	260.4	586.3	301.5	551.7	300.8	1636.7	339.5	910.5	1642.7	737.3	1247.4
Total	14,220.8		18,391.9		18,015		21,569.7		23,236.7		20,150.7	

Phosphorus Reductions by Reach

FIGURE 11.1.

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

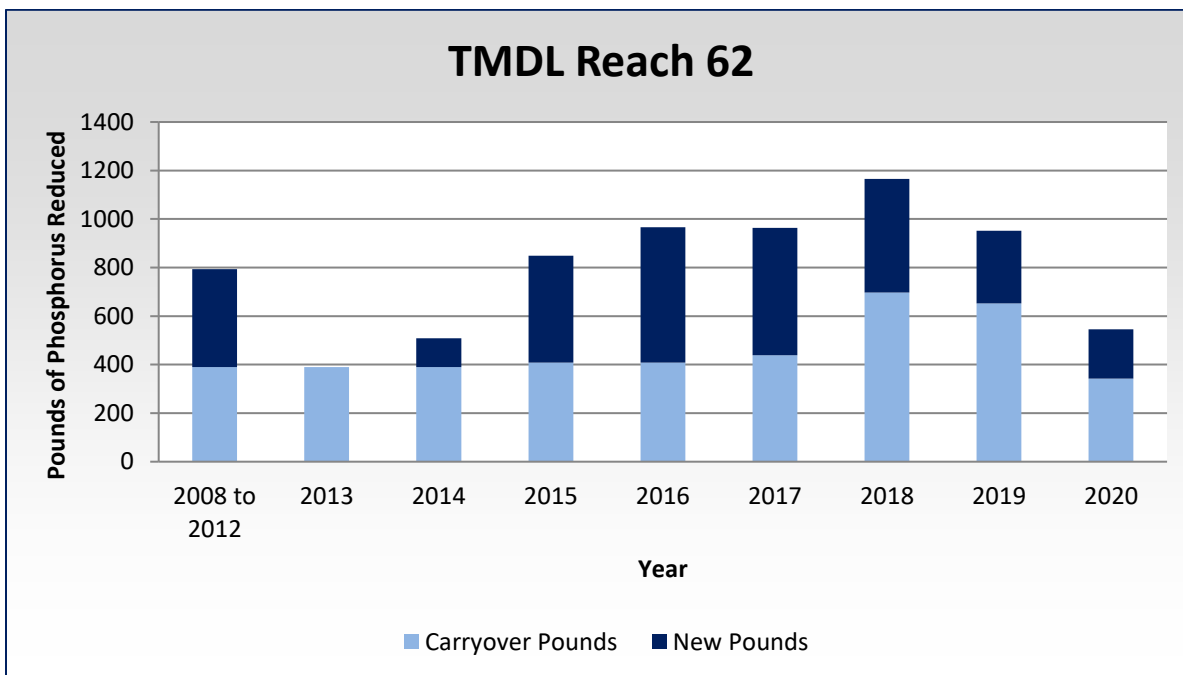


FIGURE 11.2.

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

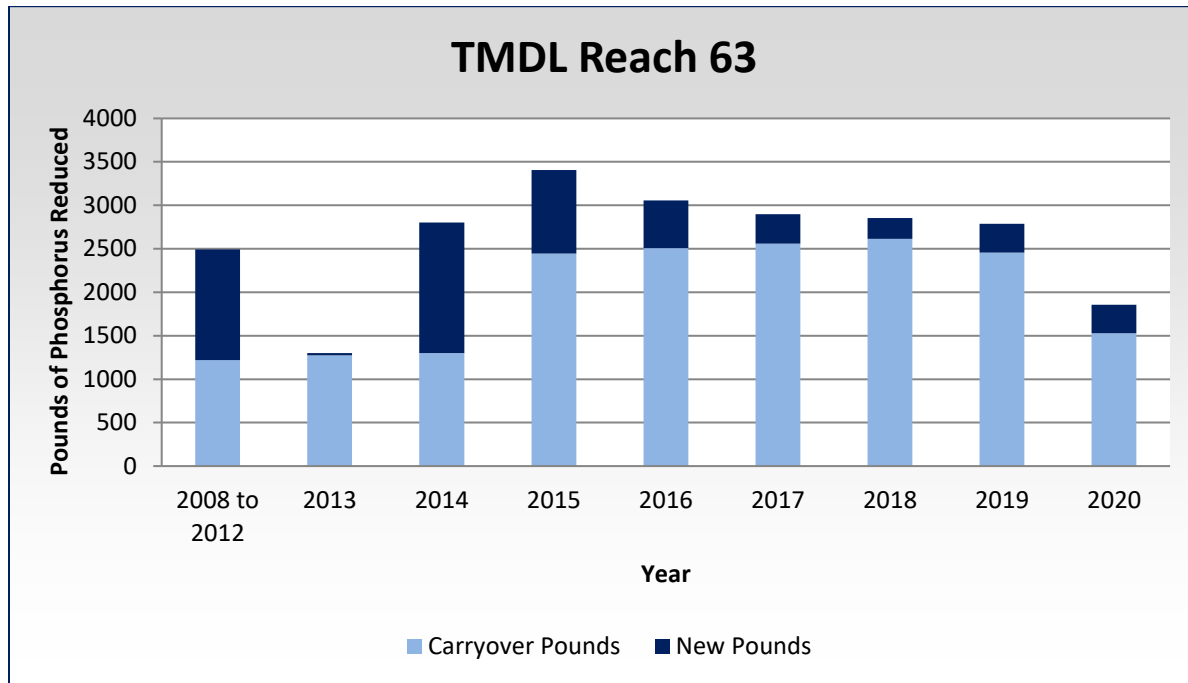


FIGURE 11.3.

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

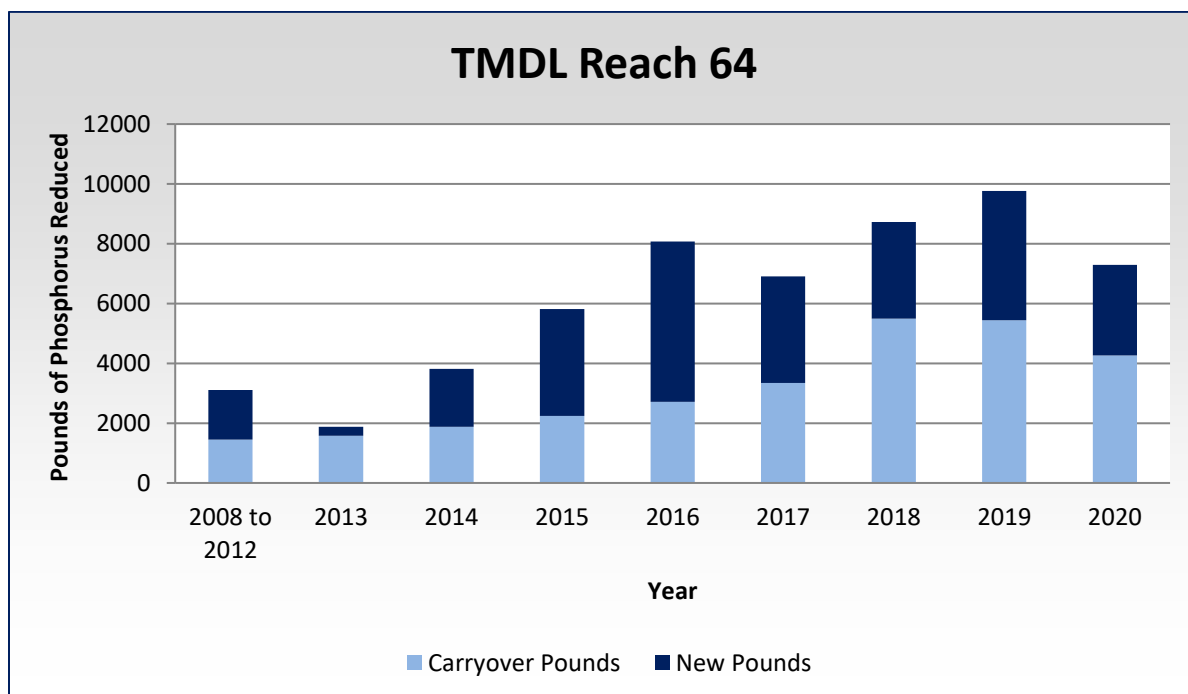


FIGURE 11.4.

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

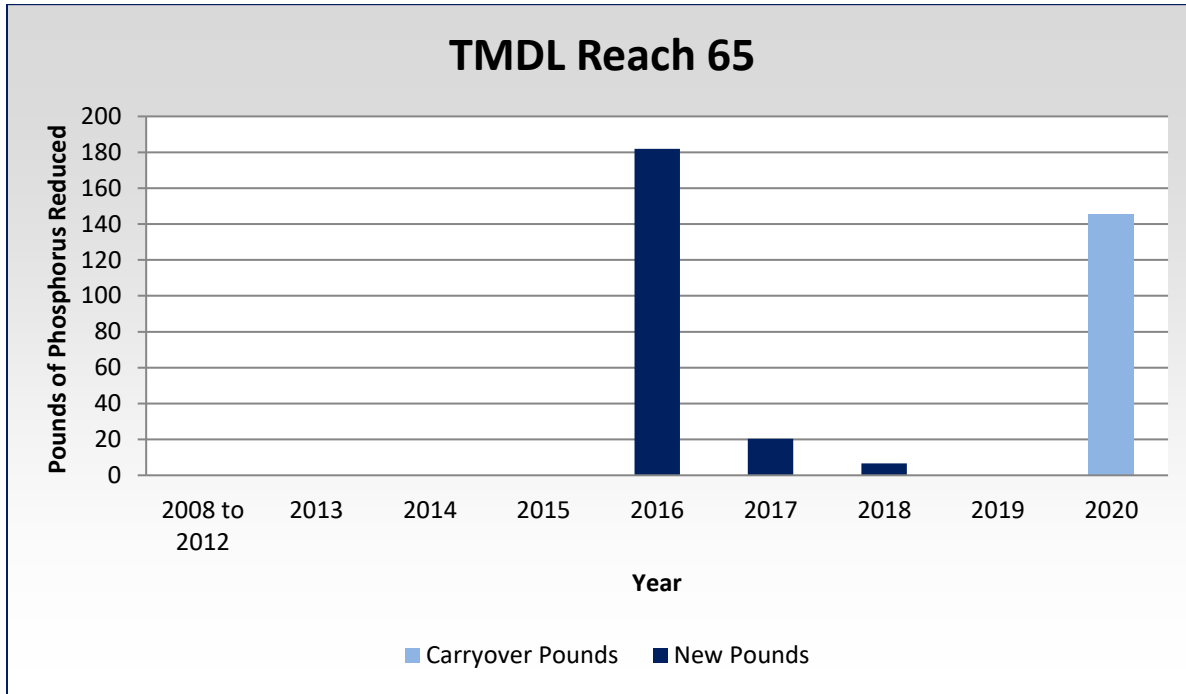


FIGURE 11.5.

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

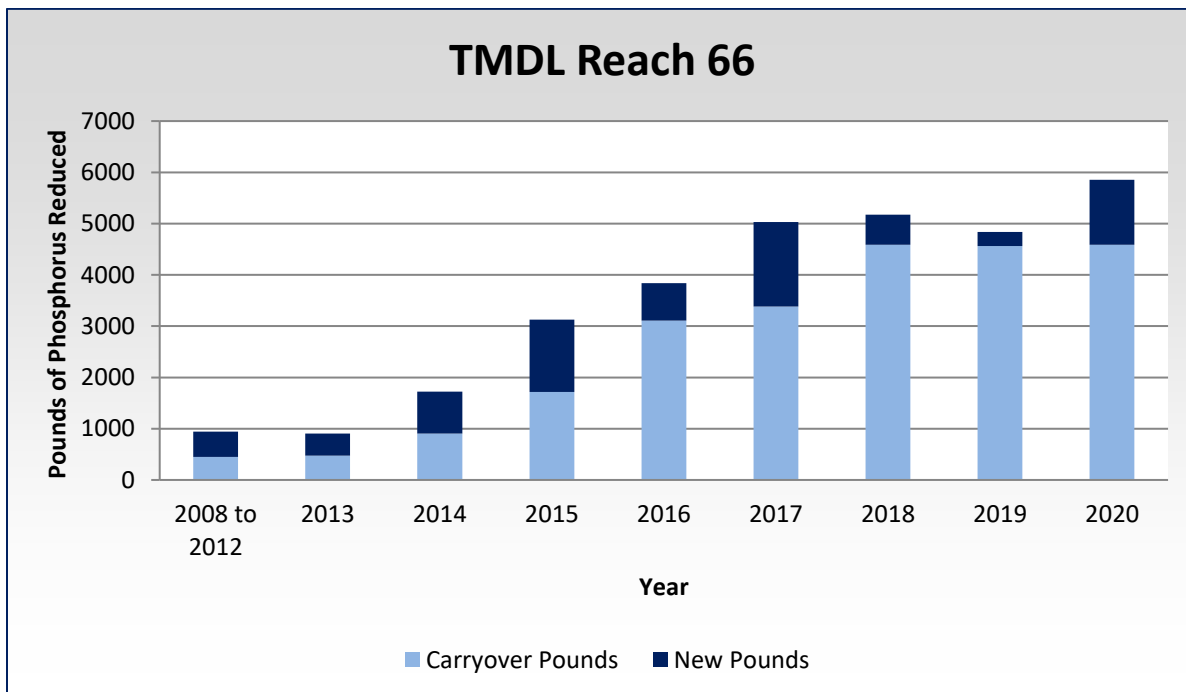


FIGURE 11.6.

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

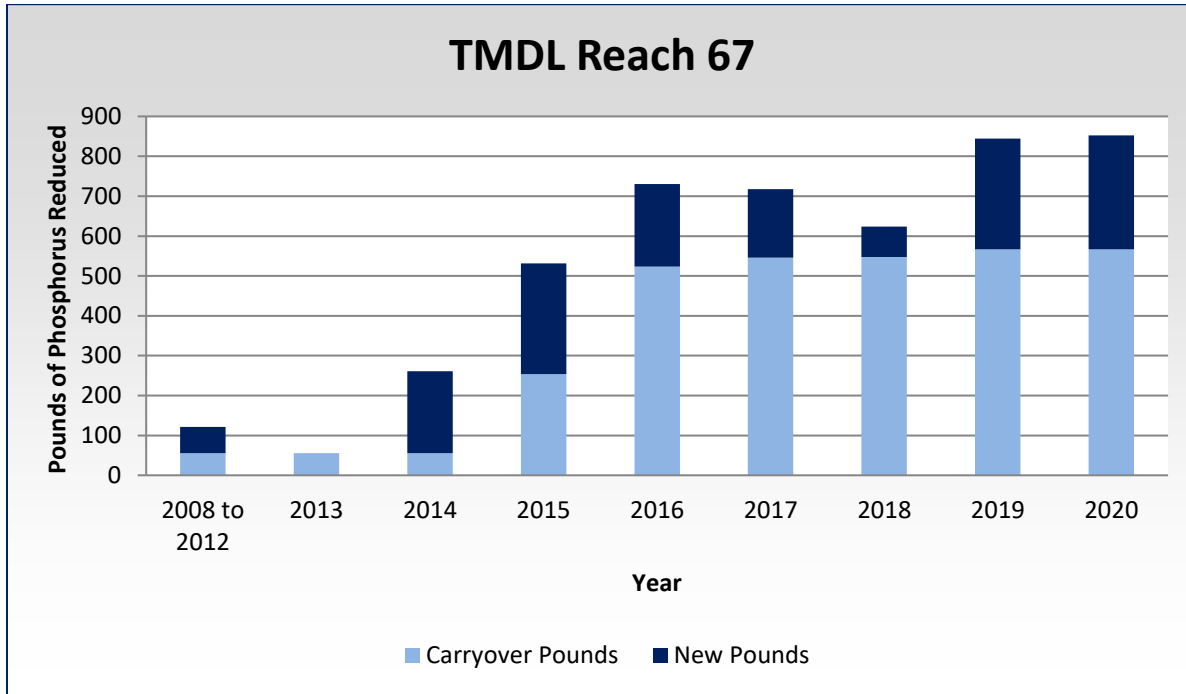


FIGURE 11.7.

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

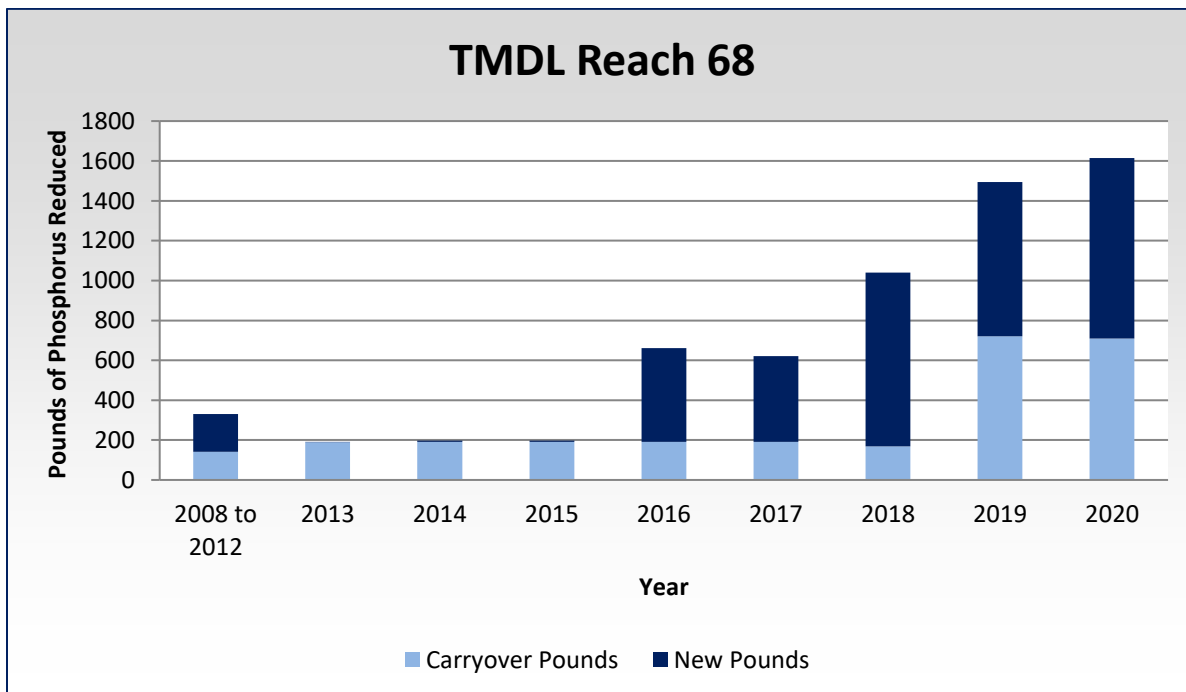
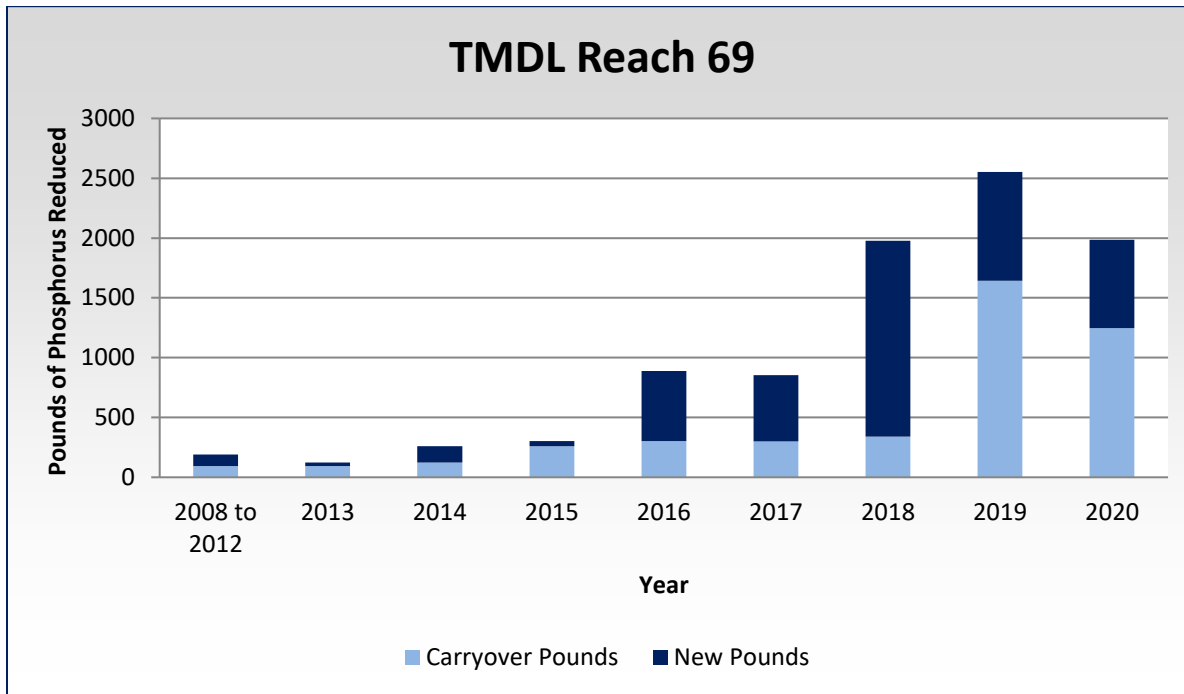


FIGURE 11.8.

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



Conclusion

Even with the global COVID-19 pandemic, Dane County successfully continued to assist landowners with the implementation of phosphorus-reducing conservation practices. More than 130 new practices were implemented bringing the total number of practices tracked for phosphorus reductions up to 987. Yahara WINS continued to provide staff funding to aid Dane County in assisting landowners and producers with the planning, design, and implementation of practices. These practices reduced the amount of phosphorus entering nearby surface waters by more than 6,700 pounds. Combining this with the more than 13,300 pounds of phosphorus reduced from previously implemented practices (carryover) resulted in a total reduction of over 20,000 pounds of phosphorus in 2020.