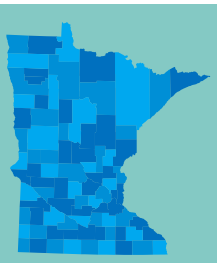
Grant

July 2023

Headwaters Pelican River Watershed NKE supplement

This document will serve as a supplement to the Pelican River Watershed District's Comprehensive Plan focusing on the Headwaters of the Pelican River Watershed especially Campbell Creek.

MINNESOTA POLLUTION CONTROL AGENCY



Authors

Cindy Osborn, MPCA
Greg Johnson, MPCA
Scott Schroeder, MPCA
Tera Guetter, PRWD

Editing and graphic design

PIO staff
Graphic design staff
Administrative Staff

Cover photo credit: Steep bank along Campbell Creek. Courtesy of Lori Clark, MDNR.

Minnesota Pollution Control Agency

520 Lafayette Road North | Saint Paul, MN 55155-4194 |

651-296-6300 | 800-657-3864 | Or use your preferred relay service | Info.pca@state.mn.us

This report is available in alternative formats upon request, and online at www.pca.state.mn.us.

Document number: wq-cwp2-44

Contents

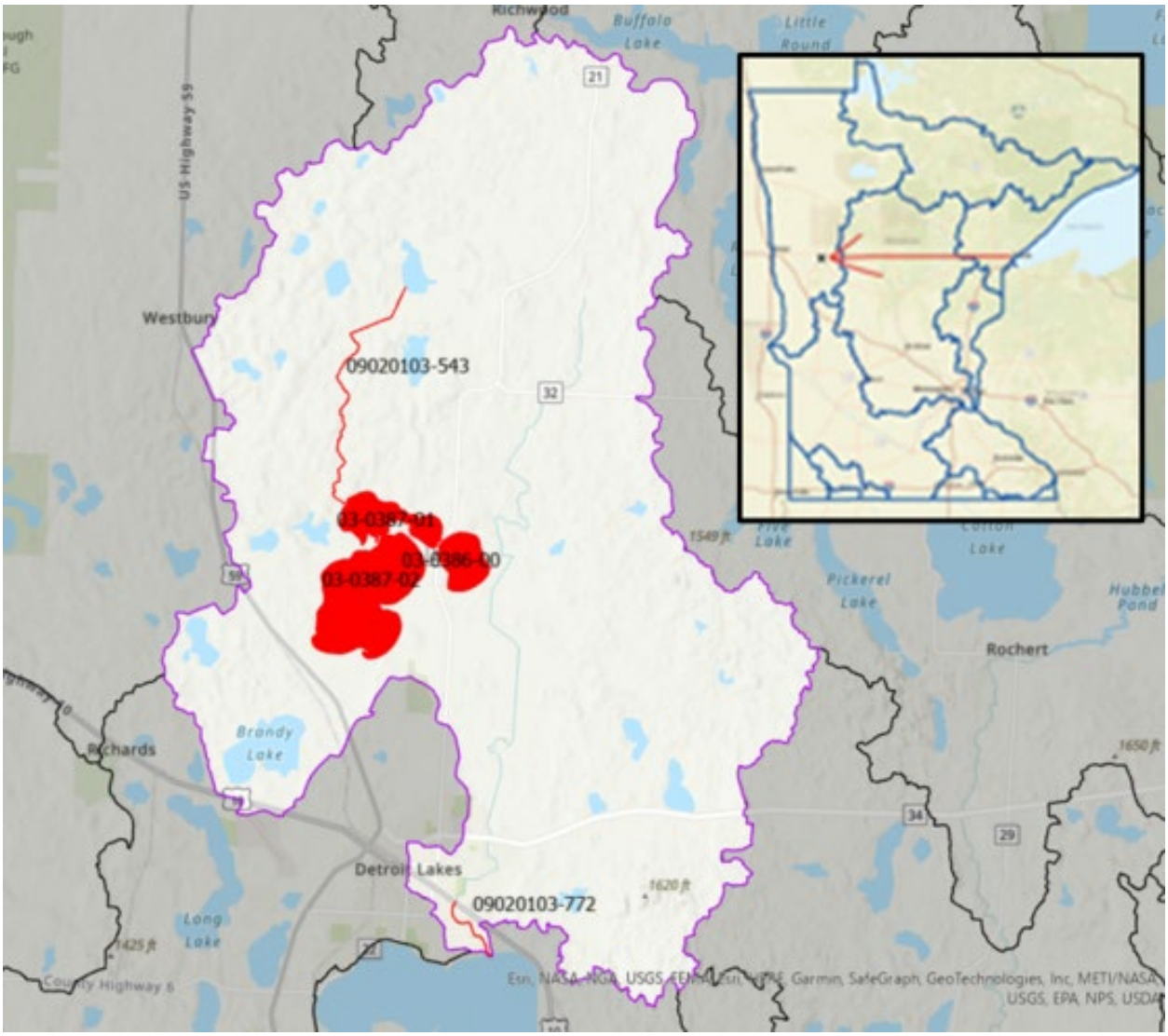
List of tables

List of figures

Executive summary

This document will serve as a supplement to the Otter Tail Comprehensive Watershed Management Plan (OTCWMP) and the Pelican River Watershed District's (PRWD) Comprehensive Plan to meet the US Environmental Protection Agency (EPA) nine key element (NKE) requirements for watershed planning. This plan will address the restoration and protection needs of the Headwaters of the Pelican River Watershed, 12-digit hydrologic unit code (HUC12) 090201030701 (Figure 1).

Figure 1. Headwaters of the Pelican River Watershed, including impaired streams and lakes, and location in the state (MPCA, 2023).



For the purposes of this plan, this HUC12 watershed is divided into five subcatchments to target the implementation and track the estimated reductions. The subcatchments are illustrated in Figure 2 and include, from upstream to downstream, Campbell Creek, Sands Lake, Floyd Lake, Little Floyd Lake, and Headwaters Pelican River/Ditch 13. The surface water resource impairments within the HUC12 watershed shown in Figure 1 are also provided in Table 1.

Figure 2. Subcatchments used in the EPA Pollutant Load Estimation Tool (PLET) (EPA, 2022) for the Headwaters of the Pelican River Watershed.

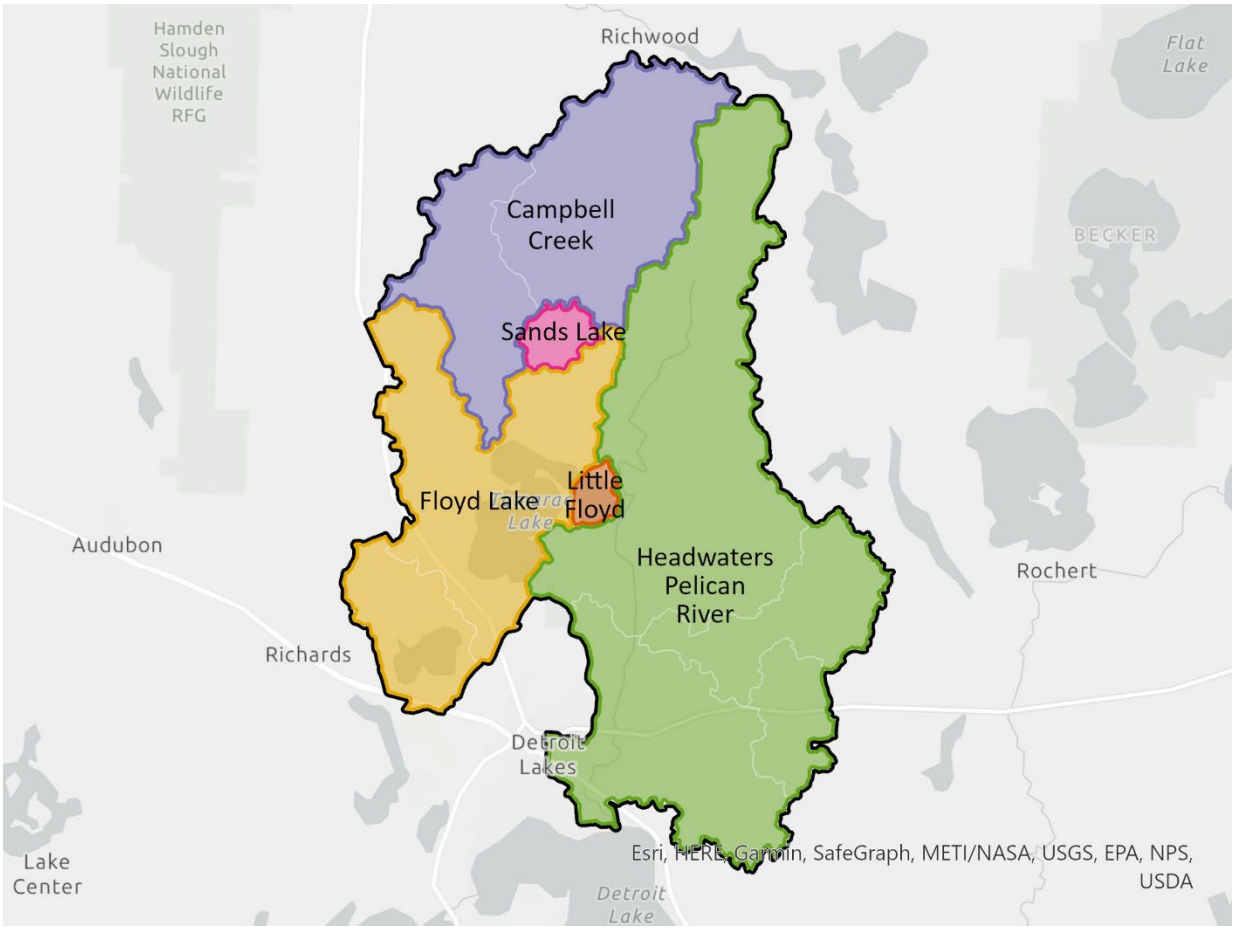


Table 1. Impaired waters within the Headwaters of the Pelican River Watershed.

Waterbody name	Waterbody description	Assessment Unit Identifier (AUID)	Use Class	Affected designated use	Pollutant or stressor
Campbell Creek	Campbell Lk to Floyd Lk	09020103-543	2Bg, 3C	Aquatic Life	Total suspended solids (TSS)
Mud (North Floyd)	Lake or Reservoir	03-0387-01	2B, 3C	Aquatic Consumption	Mercury in fish tissue
Floyd (south bay)	Lake or Reservoir	03-0387-02	2B, 3C	Aquatic Consumption	Mercury in fish tissue
Little Floyd	Lake or Reservoir	03-0386-00	2B, 3C	Aquatic Consumption	Mercury in fish tissue
Pelican River	Highway 10 to Detroit Lk	09020103-772	2Bg, 3C	Aquatic Life	Dissolved oxygen; Benthic macroinvertebrates bioassessments; Fish bioassessments
				Aquatic Recreation	*Escherichia coli* (*E. coli*)

Funding of projects proposed in this plan may be restricted to funding source. Only projects and practices that are allowable by EPA's 2014 program guidelines and Minnesota's Nonpoint Source Program Management Plan (except where noted in the MPCA's NPSMPP) will be funded by the Federal Clean Water Act Section 319 funds. Match funds and activities must also be eligible under the guidelines and plan.

Current water quality conditions

The primary issues impacting surface water quality in the Headwaters of the Pelican River Watershed are excess phosphorus and sediment (TSS) from overland runoff and in-channel erosion, as well as excess *E. coli* bacteria and low dissolved oxygen. Many of the water quality issues are driven by changes in the landscape and land use, including lakeshore and shoreline development and intensive agricultural production (Table 2). Increases in impervious surfaces on developed lands and increases in ditching and drainage in cropland have led to increases in stormwater runoff and have exacerbated pollutant loading from heavy precipitation and significant storm events. Significant portions of Campbell Creek and almost the entirety of the Pelican River from its headwaters to its outlet to Detroit Lake have been straightened, ditched, or altered, resulting in increased peak flows and channel instability. Predicted changes to climate conditions, including warming average temperatures and increases in intense storm events, may also exacerbate water quality issues in the area (PRWD, 2020a).

Table 2: Land cover by subcatchment in the Headwaters of the Pelican River Watershed (EPA, 2022).

Subcatchment	Urban/ Developed		Cropland		Pasture/ Rangeland		Forest		Totals
	Acres	% Cover	Acres	% Cover	Acres	% Cover	Acres	% Cover	Acres
Campbell Creek	376.25	5%	1868.25	24%	1781.5	23%	3816.97	48%	7842.97
Floyd Lake	626.52	10%	1258.36	20%	1507.28	23%	3019.4	47%	6411.56
Headwaters Pelican River/Ditch 13	1993.28	22%	1652.37	19%	5252.42	59%	0	0%	8898.07
Little Floyd Lake	7.78	28%	20.41	72%	0	0%	0	0%	28.19
Sands Lake	26.61	6%	26.41	6%	32	8%	339.2	80%	424.22
Totals	3030.44	13%	4825.8	21%	8573.2	36%	7175.57	30%	23605.01

While there are no nutrient-impaired lakes within the Headwaters of the Pelican River Watershed, Mud (North Floyd) and Little Floyd Lakes have been identified as high risk of impairment, while Floyd (South Bay) has been identified as low risk but also worthy of protection. Excess phosphorus in lakes can inhibit recreation by causing nuisance algal blooms and can also harm fish and other organisms. Campbell Creek has been identified as having elevated phosphorus and sediment loads, which it conveys downstream to the Floyd Lakes. Additionally, increasing dissolved phosphorus concentrations have been identified in the Pelican River as it runs from its headwaters through the Rice Lake Wetland area, and to its outlet to Detroit Lake at the bottom of the watershed (PRWD, 2020a). A portion of Campbell Creek, from Campbell Lake to the Floyd Lakes, has been identified by the MPCA as impaired due to excessive TSS, and a portion of the Pelican River within the City of Detroit Lakes, from Highway 10 to Detroit Lake, has been identified as impaired due to excess *E. coli* bacteria, low dissolved oxygen, and poor fish and macroinvertebrate bioassessment scores.

The PRWD and the Headwaters of the Pelican River Watershed are part of the *Otter Tail Watershed Comprehensive Watershed Management Plan* (OTCWMP), finalized in December 2022 and approved in

January 2023. In the development of the OTCWMP, the Otter Tail Watershed Partnership has worked together to identify priority natural resource issues and focus surface water and groundwater resources within the Otter Tail River major watershed, and to develop measurable goals, implementation actions, and funding opportunities for those priority issues and resources. Nutrient and sediment loading from overland erosion, *E. coli* bacteria loading, altered hydrology, and streambank stability are just some of the priority issues identified in the OTCWMP, while Campbell Creek, the Floyd Lakes, and the Pelican River have been identified as focus resources (PRWD, 2023a). Therefore, the Headwaters of the Pelican River Watershed is included in the OTCWMP, and the OTCWMP provides a significant opportunity to supplement this plan.

Total maximum daily loads (TMDL)

Section 303(d) of the Clean Water Act (CWA) provides authority for completing Total Maximum Daily Loads (TMDLs) to achieve state water quality standards and/or designated uses. TMDLs are required to be developed for waters that do not support their designated uses and are determined to be impaired. The TMDL establishes the maximum amount of a pollutant a waterbody can receive daily and still meet water quality standards. There are two completed and approved TMDLs for aquatic life and aquatic recreation use impairments in the Headwaters of the Pelican River Watershed. TSS and *E. coli* impairments in Campbell Creek and the Pelican River, respectively, led to the development of the TMDLs as part of the *Otter Tail River Watershed Total Maximum Daily Load Report*, approved by the EPA in October 2021. The MPCA has "deferred" the dissolved oxygen, benthic macroinvertebrate bioassessments, and fish bioassessments aquatic life use impairments for the Pelican River due to the PRWD's ongoing Rice Lake wetland restoration project located upstream of these impairments (MPCA, 2021a). These three impairments may be expected to meet their respective standards in the future because of the completed restoration project and will be noted for re-evaluation by the MPCA starting in 2027.

The two completed and approved TMDLs are summarized below. For more information on the completed TMDLs and the deferred aquatic life use impairments please see the full TMDL report. The MPCA addresses aquatic consumption use impairments due to mercury in fish tissue as part of the Minnesota statewide mercury TMDL, initially approved by the EPA in 2007 (MPCA, 2022a). These such impairments in Floyd, Mud (North Floyd), and Little Floyd Lakes will be addressed via the statewide mercury TMDL.

TSS TMDL

The TSS TMDL was written for Campbell Creek (AUID 09020103-543). The load duration curve is provided in Figure 3 and the TMDL is summarized in Table 3. The TMDL calls for a 67% overall reduction in TSS concentrations within the stream (milligrams per liter) to achieve water quality standards. The Pollutant Load Estimation Tool (PLET) (EPA, 2022) calculates the TSS loading within the Campbell Creek subcatchment at 701.57 tons per year (t/yr) and the necessary TSS reductions in the subcatchment to meet standards at 445.89 t/yr (64%). This plan, when fully implemented and as calculated in the PLET, reduces subcatchment sediment loading by 539.87 t/yr (77%), therefore exceeding both the PLET and TMDL reductions for this waterbody.

Figure 3. TSS load duration curve for Campbell Creek, Campbell Lake to Floyd Lake (AUID 09020103-543).

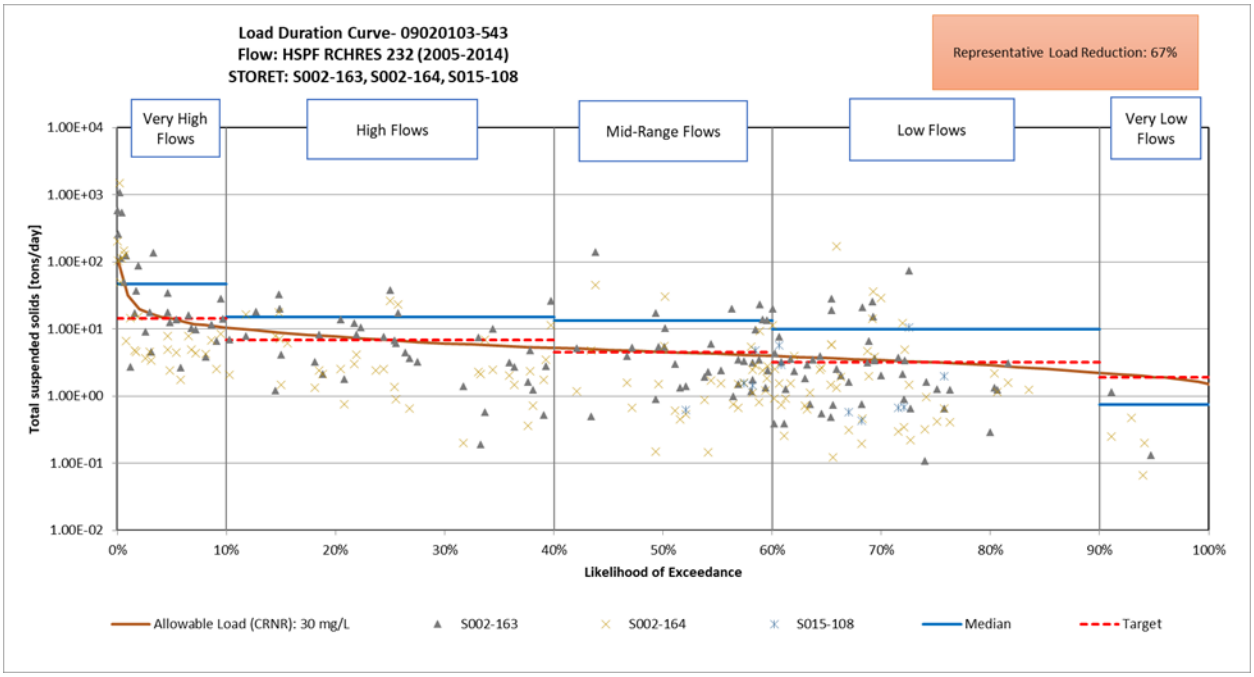


Table 3. TSS TMDL allocations for Campbell Creek, Campbell Lake to Floyd Lake (AUID 09020103-543).

Total Suspended Solids Listing year: 2020 Baseline year: 2013 Numeric WQ standard used: 30 mg/L		**Flow Condition**				
		Very High	**High**	**Mid-Range**	**Low**	**Very Low**
		[tons/day]				
Loading Capacity		**14.22**	**6.86**	**4.56**	**3.180**	**1.931**
Wasteload Allocation	*Construction/Industrial Stormwater*[1]	0.04	0.02	0.01	0.010	0.006
	Total WLA	**0.04**	**0.02**	**0.01**	**0.010**	**0.006**
Load Allocation	**Total LA**	**12.76**	**6.15**	**4.09**	**2.852**	**1.732**
Margin of Safety (MOS)		**1.42**	**0.69**	**0.46**	**0.318**	**0.193**
Existing Load		**46.74**	**14.95**	**13.31**	**9.92**	**0.74**
Load Reduction		**32.52**	**8.09**	**8.75**	**6.74**	**0**
Percent Load Reduction		**70%**	**54%**	**66%**	**68%**	**0%**
90th Percentile Concentration		**91.2 mg/L**				
Overall estimated percent reduction[2]		**67%**				

[1]Assumes 0.3% of drainage area is under construction or industrial activities at any given time.

[2]Overall load reduction based on the 90th percentile of all observed TSS data and the 30 mg/L water quality standard.

E. coli TMDL

The *E. coli* TMDL was written for the Pelican River (AUID 09020103-772). The load duration curve is provided in Figure 4 and the TMDL is summarized in Table 4. Similar to the TSS TMDL, the *E. coli* TMDL calls for a 48% overall reduction in *E. coli* concentrations within the stream (organisms per 100 milliliters) to achieve water quality standards. This plan, when fully implemented, is expected to exceed the 48% overall *E. coli* reduction needed to meet the TMDL for this waterbody.

Figure 4. *E. coli* load duration curve for Pelican River, Highway 10 to Detroit Lake (AUID 09020103-772).

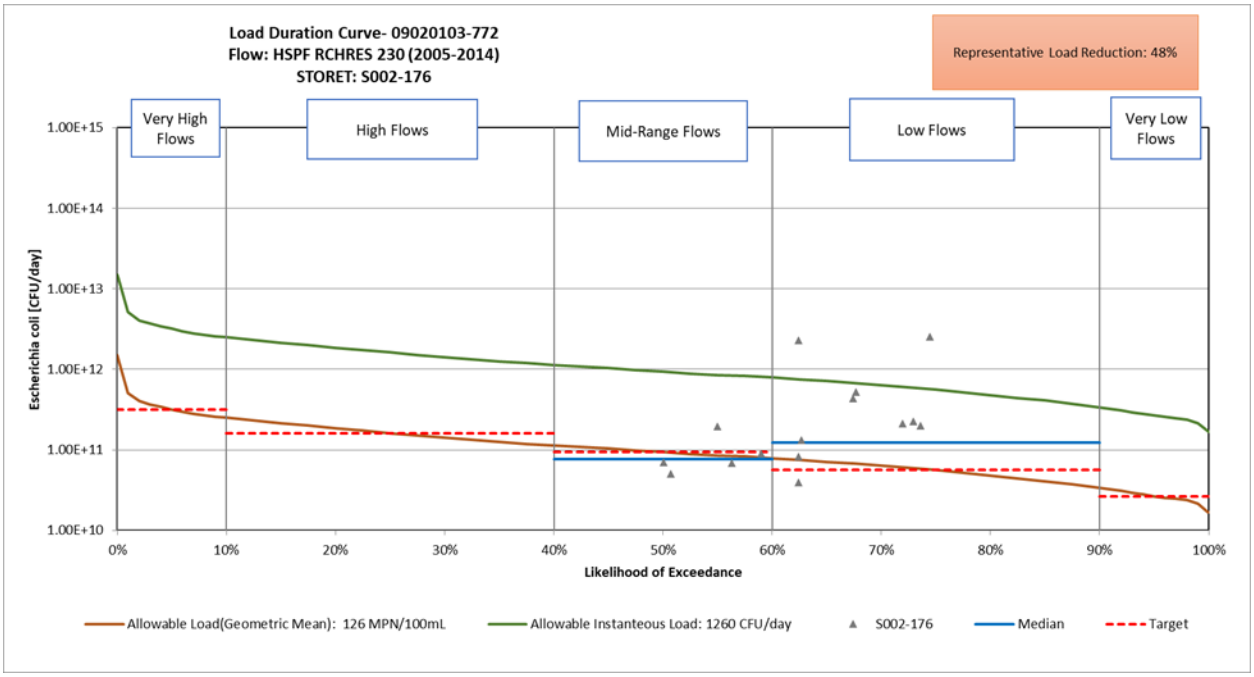


Table 4. *E. coli* TMDL allocations for Pelican River, Highway 10 to Detroit Lake (AUID 09020103-772).

Escherichia coli Listing year: 2020 Baseline year: 2016 Numeric WQ standard used: 126 org/100 mL		**Flow Condition**				
		Very High	**High**	**Mid-Range**	**Low**	**Very Low**
		[Billions organisms/day]				
Loading Capacity		**319**	**162.0**	**93.8**	**55.92**	**26.58**
Wasteload Allocation	*Detroit Lakes (MS400230)*[1]	16	8.1	4.7	2.80	1.33
	Total WLA	**16**	**8.1**	**4.7**	**2.80**	**1.33**
Load Allocation	**Total LA**	**271**	**137.7**	**79.7**	**47.53**	**22.59**
Margin of Safety (MOS)		**32**	**16.2**	**9.4**	**5.59**	**2.66**
Average existing monthly geometric mean[2]		**241.0 org/100 mL**				
Overall estimated percent reduction		**48%**				

[1]The portion of the Detroit Lakes MS4 within this drainage area represents 5.01% of the contributing drainage area, therefore it gets a WLA of 5.01% of the loading capacity (see Section 4.2.3).

[2]Average existing monthly geometric mean taken as the average of summer months (June-August).

Protection goals

The PRWD has identified goals to reduce the phosphorus loading to Floyd, Little Floyd, and Sands Lakes (Table 5). The protection goal for Floyd Lake currently includes Mud (North Floyd) Lake; the PRWD has prioritized a goal of refining this to also include a protection goal specifically for Mud (North Floyd) Lake. This plan, when fully implemented, is expected to exceed the established protection goals for these lakes.

Table 5. Phosphorus reduction goals to protect Floyd, Little Floyd, and Sands Lakes

Lake	Reduction Goal (lbs/yr)	Reduction Goal (%)
Floyd	52	5%
Little Floyd	53	5%
Sands	3	5%

Implementation strategies

The implementation strategies, schedule, milestones, assessments, costs, and the estimated pollutant reductions by practice are described in Table 6. These strategies and activities will achieve the estimated reductions to achieve water quality standards and goals for the Headwaters of the Pelican River Watershed in 10 years. Estimated pollutant reductions by practice were calculated using the EPA's Pollutant Load Estimation Tool (PLET) for decision-making purposes. Reductions for this plan were calculated using the PLET combined efficiencies; therefore, the summation of individual practice estimates may not equal the reductions estimated for the entire plan.

Eligibility for funding refers to current practice eligibility in 2023, as described in the EPA's 2014 Guidance and Minnesota's 2021 NSPMP. Practices are subject to final verification at the time of any financial award and must meet all current and necessary rules and guidelines for eligibility. Any stormwater activities that take place in an MS4 permitted conveyance system are not eligible for Section 319 grant funding, nor can they be used for match funding. Monitoring to determine the effectiveness of this plan and the BMPs implemented is eligible for Section 319 funding. General diagnostic and exploratory monitoring activities are not eligible for funding or match purposes.

Table 6. Activities, BMPs, milestones, schedule, costs, and individual reductions for the Headwaters of the Pelican River Watershed (2023-2032)

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
Goals	Y	Meet lake water quality goals in the Headwaters of the Pelican River Watershed, and in downstream lakes outside of the watershed, through phosphorus load reductions.	Floyd Lake -- 52 lb/yr P reduction Little Floyd Lake -- 53 lb/yr P reduction Sands Lake - 3 lb/yr P reduction Goals from Lake P Sensitivity Study	Floyd Lake -- 52 lb/yr P reduction Little Floyd Lake -- 53 lb/yr P reduction Sands Lake - 3 lb/yr P reduction Goals from Lake P Sensitivity Study	Floyd Lake -- 52 lb/yr P reduction Little Floyd Lake -- 53 lb/yr P reduction Sands Lake - 3 lb/yr P reduction Goals from Lake P Sensitivity Study	Floyd Lake -- 52 lb/yr P reduction Little Floyd Lake -- 53 lb/yr P reduction Sands Lake - 3 lb/yr P reduction Goals from Lake P Sensitivity Study	Floyd Lake -- 52 lb/yr P reduction Little Floyd Lake -- 53 lb/yr P reduction Sands Lake - 3 lb/yr P reduction Goals from Lake P Sensitivity Study	# lbs/yr est. reductions TP =< WQ goals	$500,000		108	
Goals	N	Refine load reduction and water quality goals specifically for Mud (North Floyd) Lake.	Refine water quality and yearly TP load reduction goals for Mud (North Floyd) Lake.	Refine water quality and yearly TP load reduction goals for Mud (North Floyd) Lake.				# lbs/yr est. reductions TP =< WQ goals	$50,000			
streambank	Y	Design, engineer, and implement a streambank stabilization plan for Campbell Creek to reduce TSS and TP loading from Campbell Creek to the Floyd Lakes.	Complete design, engineering, and permitting process for Campbell Creek streambank stabilization project. Begin in-field BMP work in downstream Campbell Creek focus area near County Road 149.	Complete in-field BMP work and begin in-channel work in downstream Campbell Creek focus area near County Road 149.	Complete in-channel work in downstream Campbell Creek focus area. Begin in-field BMP work in upstream focus areas from Campbell Lake to near 230th Street and to County Road 149.	Complete in-field BMP work in upstream focus areas. Begin in-channel work in upstream Campbell Creek focus area out of Campbell Lake.	Complete all in-field and in-channel work in Campbell Creek from Campbell Lake to Mud (North Floyd) Lake.	# plan # feet # complete project	$4,000,000			
streambank	Y	Complete design, engineering, permitting, and environmental review process, as applicable, for Campbell Creek streambank stabilization project, including stream channel stabilization work, wetland restoration, installation of ag BMPs, and other practices.	Complete engineer's design plans, complete MDNR works in public waters and any other local, state, or federal permitting, complete environmental review.					Project design, permitting, and planning completed.	$200,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
streambank	Y	Complete approximately 3,750 linear feet of streambank stabilization of Campbell Creek from roughly 1,400 feet upstream of County Road 149 to roughly 2,400 feet downstream of County Road 149, including rock riffle grade-control structures, toe-wood and/or root wad installations, tree revetments, log/debris jam removal, establishment of deep-rooted riparian vegetation, reconnecting natural floodplains, addressing high cut banks, and other streambank stabilization practices.		Begin in-channel stabilization work in downstream Campbell Creek focus area near County Road 149.	Complete in-channel stabilization work in downstream Campbell Creek focus area near County Road 149.			# feet streambank stabilized and/or restored	$2,000,000	203.95	78.52	127.47
streambank	Y	Replace, reset, or enhance the existing road culvert underneath County Road 149 to allow for the channel bed to be raised to a stable condition, and/or to allow for stream stabilization without steep slopes if done		Replace, reset, or enhance County Road 149 culvert as part of Campbell Creek streambank stabilization efforts.	Replace, reset, or enhance County Road 149 culvert as part of Campbell Creek streambank stabilization efforts.			CR 149 culvert replaced and properly aligned	$40,000	10.06		0.24

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
		without culvert replacement.										
	Y	Install one multi-stage ditch along a portion of Campbell Creek within the Campbell Creek Subcatchment to treat sediment loading from approximately 300 acres.		Install multi-stage ditch along Campbell Creek treating 100 acres.	Install multi-stage ditch along Campbell Creek treating 100 acres.	Install multi-stage ditch along Campbell Creek treating 100 acres.	Complete installation of multi-stage ditch practice.	# multi-stage ditch installed	$2,000,000.00	53.85	19.84	0.00
crop	Y	Restore/create 93.5 acres of wetlands in the Campbell Creek Subcatchment	Restore/create approximately 18.7 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 18.7 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 18.7 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 18.7 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 18.7 acres of wetlands to increase water storage and reduce sediment loading.	# acres wetlands restored/created	$1,028,500	217.06	48.91	23.25
crop	Y	Restore/create 62.9 acres of wetlands in the Floyd Lake Subcatchment	Restore/create approximately 12.6 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 12.6 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 12.6 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 12.6 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 12.6 acres of wetlands to increase water storage and reduce sediment loading.	# acres wetlands restored/created	$691,900	205.97	46.94	22.74
crop	Y	Restore/create 82.6 acres of wetlands in the Headwaters Pelican River/Ditch 13 Subcatchment	Restore/create approximately 16.5 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 16.5 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 16.5 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 16.5 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 16.5 acres of wetlands to increase water storage and reduce sediment loading.	# acres wetlands restored/created	$908,600	233.39	52.21	24.51
crop	Y	Restore/ create 1 acre of wetlands in the Little Floyd Lake Subcatchment	Restore/create approximately 0.2 acre of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.2 acre of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.2 acre of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.2 acre of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.2 acre of wetlands to increase water storage and reduce sediment loading.	# acres wetlands restored/created	$11,000	3.88	1.17	0.79

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Restore/create 1.5 acres of wetlands in the Sands Lake Subcatchment	Restore/create approximately 0.3 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.3 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.3 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.3 acres of wetlands to increase water storage and reduce sediment loading.	Restore/create approximately 0.3 acres of wetlands to increase water storage and reduce sediment loading.	# acres wetlands restored/created	$16,500	3.95	1.03	0.61
crop	Y	Complete phase 2 (lower structure) of the 461-acre Rice Lake Wetland restoration project within the Headwaters Pelican River/Ditch 13 Subcatchment, which includes installing water control structures, replacing culverts, and securing easements in order to improve water quality, restore natural hydrology, and provide wildlife and aquatic habitat.	Completion of 461-acre Rice Lake Wetland restoration project, impounding approximately 691 acre-ft of water					# lbs/yr TP reduced to Pelican River/Ditch 13 & downstream Detroit Lakes	$1,300,000		900.00	
crop	Y	Install 40 water and sediment control basins (WASCOBs) in the Campbell Creek Subcatchment	Install 8 WASCOBs	Install 8 WASCOBs	Install 8 WASCOBs	Install 8 WASCOBs	Install 8 WASCOBs	# WACOBs installed	$270,000	268.51	74.28	36.75
crop	Y	Install 31 water and sediment control basins (WASCOBs) in the Floyd Lake Subcatchment	Install 6 WASCOBs	Install 6 WASCOBs	Install 6 WASCOBs	Install 6 WASCOBs	Install 7 WASCOBs	# WACOBs installed	$209,250	212.28	59.20	29.82

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Install 40 water and sediment control basins (WASCOBs) in the Headwaters Pelican River/Ditch 13 Subcatchment	Install 8 WASCOBs	Install 8 WASCOBs	Install 8 WASCOBs	Install 8 WASCOBs	Install 8 WASCOBs	# WACOBs installed	$270,000	927.81	255.36	124.85
crop	Y	Install 1 water and sediment control basin (WASCOB) in the Little Floyd Lake Subcatchment					Install 1 WASCOB	# WACOBs installed	$6,750	14.41	4.84	3.34
crop	Y	Install 1 water and sediment control basin (WASCOB) in the Sands Lake Subcatchment					Install 1 WASCOB	# WACOBs installed	$6,750	9.20	2.81	1.69
crop	Y	Plant approximately 1,827 acres of cover crops in the Campbell Creek Subcatchment	Plant approximately new 365.4 acres of cover crops	Plant approximately new 365.4 acres of cover crops	Plant approximately new 365.4 acres of cover crops	Plant approximately new 365.4 acres of cover crops	Plant approximately new 365.4 acres of cover crops	# acres of cover crop	$91,843	824.82	168.02	83.97
crop	Y	Plant approximately 245 acres of cover crop in the Floyd Lake Subcatchment	Plant approximately new 49 acres of cover crops	Plant approximately new 49 acres of cover crops	Plant approximately new 49 acres of cover crops	Plant approximately new 49 acres of cover crops	Plant approximately new 49 acres of cover crops	# acres of cover crop	$12,316	111.93	23.11	11.76
crop	Y	Plant approximately 1625 acres of cover crop in the Headwaters Pelican River/Ditch 13 Subcatchment	Plant approximately new 325 acres of cover crops	Plant approximately new 325 acres of cover crops	Plant approximately new 325 acres of cover crops	Plant approximately new 325 acres of cover crops	Plant approximately new 325 acres of cover crops	# acres of cover crop	$81,669	726.94	146.80	72.52
crop	Y	Plant approximately 13 acres of cover crop in the Little Floyd Lake Subcatchment		Plant approximately new 13 acres of cover crops				# acres of cover crop	$654	10.79	3.10	2.15

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Plant approximately 26 acres of cover crop each year in the Sands Lake Subcatchment			Plant approximately new 26 acres of cover crops			# acres of cover crop	$1,357	1519.09	368.71	223.52
crop	Y	Convert approximately 1,827 acres to no tillage in the Campbell Creek Subcatchment	Add approximately new 365.4 acres to no till	Add approximately new 365.4 acres to no till	Add approximately new 365.4 acres to no till	Add approximately new 365.4 acres to no till	Add approximately new 365.4 acres to no till	# acres of no till per year	$30,219	1716.00	693.99	323.29
crop	Y	Convert approximately 245 acres of no tillage in the Floyd Lake Subcatchment	Add approximately new 49 acres to no till	Add approximately new 49 acres to no till	Add approximately new 49 acres to no till	Add approximately new 49 acres to no till	Add approximately new 49 acres to no till	# acres of no till per year	$4,052	235.90	95.28	45.27
crop	Y	Convert approximately 1625 acres to no tillage in the Headwaters Pelican River/Ditch 13 Subcatchment	Add approximately new 325 acres to no till	Add approximately new 325 acres to no till	Add approximately new 325 acres to no till	Add approximately new 325 acres to no till	Add approximately new 325 acres to no till	# acres of no till per year	$26,878	14499.93	607.12	279.21
crop	Y	Convert approximately 13 acres to no tillage in the Little Floyd Lake Subcatchment			Add approximately new 13 acres to no till			# acres of no till per year	$215	31.26	12.27	8.27
crop	Y	Convert approximately 26 acres to no tillage in the Sands Lake Subcatchment				Add approximately new 26 acres to no till		# acres of no till per year	$447	37.39	14.88	8.61
crop	Y	Implement 187 acres of small grain rotations in the Campbell Creek Subcatchment	Implement approximately 37.4 acres of small grain rotations	Implement approximately 37.4 acres of small grain rotations	Implement approximately 37.4 acres of small grain rotations	Implement approximately 37.4 acres of small grain rotations	Implement approximately 37.4 acres of small grain rotations	# acres of small grain rotations	$5,610	84.34	17.18	8.59

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Implement 126 acres of small grain rotations in Floyd Lake Subcatchment	Implement approximately 25.2 acres of small grain rotations	Implement approximately 25.2 acres of small grain rotations	Implement approximately 25.2 acres of small grain rotations	Implement approximately 25.2 acres of small grain rotations	Implement approximately 25.2 acres of small grain rotations	# acres of small grain rotations	$3,780	1119.29	231.13	117.59
crop	Y	Implement 166 acres of small grain rotations in the Headwaters Pelican River/Ditch 13 Subcatchment	Implement approximately 33.2 acres of small grain rotations	Implement approximately 33.2 acres of small grain rotations	Implement approximately 33.2 acres of small grain rotations	Implement approximately 33.2 acres of small grain rotations	Implement approximately 33.2 acres of small grain rotations	# acres of small grain rotations	$4,980	7269.42	1468.10	725.21
crop	Y	Implement 2 acres of small grain rotations in the Little Floyd Lake Subcatchment		Implement approximately 2 acres of small grain rotations				# acres of small grain rotations	$60	107.87	31.01	21.48
crop	Y	Implement 2.5 acres of small grain rotations in the Sands Lake Subcatchment			Implement approximately 2.5 acres of small grain rotations			# acres of small grain rotations	$75	1.52	0.37	0.22
crop	Y	Implement approximately 97 acres of grassed waterways in the Campbell Creek Subcatchment	Implement approximately 19.4 acres of grassed waterways	Implement approximately 19.4 acres of grassed waterways	Implement approximately 19.4 acres of grassed waterways	Implement approximately 19.4 acres of grassed waterways	Implement approximately 19.4 acres of grassed waterways	# grassed waterways # acres	$155,242	65.24	18.05	8.93
crop	Y	Implement approximately 24 acres of grassed waterways in the Floyd Lakes Subcatchment	Implement approximately 4.8 acres of grassed waterways	Implement approximately 4.8 acres of grassed waterways	Implement approximately 4.8 acres of grassed waterways	Implement approximately 4.8 acres of grassed waterways	Implement approximately 4.8 acres of grassed waterways	# grassed waterways # acres	$38,243	16.40	4.57	2.30
crop	Y	Implement approximately 104 acres of grassed waterways in the Headwaters Pelican River/Ditch 13 Subcatchment	Implement approximately 20.8 acres of grassed waterways	Implement approximately 20.8 acres of grassed waterways	Implement approximately 20.8 acres of grassed waterways	Implement approximately 20.8 acres of grassed waterways	Implement approximately 20.8 acres of grassed waterways	# grassed waterways # acres	$164,936	69.01	18.99	9.29

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Implement approximately 1.25 acres of grassed waterways in the Little Floyd Lake Subcatchment				Implement 1.25 acres grassed waterways		# grassed waterways # acres	$2,013	1.83	0.61	0.42
crop	Y	Implement approximately 5.5 acres of grassed waterways in the Sands Lake Subcatchment					Implement 5.5 acres grassed waterways	# grassed waterways # acres	$8,681	2.50	0.76	0.46
crop	Y	Implement approximately 10 total (13.48 acres) grade stabilization structures in the Campbell Creek Subcatchment	Implement 2 grade stabilizations, approximately 2.7 acres	Implement 2 grade stabilizations, approximately 2.7 acres	Implement 2 grade stabilizations, approximately 2.7 acres	Implement 2 grade stabilizations, approximately 2.7 acres	Implement 2 grade stabilizations, approximately 2.7 acres	# acres # grade stabilizations	$5,196,466	9.03	2.50	1.24
crop	Y	Implement approximately 1 total (1.12 acres) grade stabilization structure in the Floyd Lake Subcatchment					Implement one grade stabilization structure, approx. 1.12 acres	# acres # grade stabilizations	$431,754	0.78	0.22	0.11
crop	Y	Implement approximately 6 total (3.01 acres) grade stabilization structures in the Headwaters Pelican River/Ditch 13 Subcatchment.	Implement 1 grade stabilization structure, approx. .6 acres	Implement 1 grade stabilization structure, approx. .6 acres	Implement 1 grade stabilization structure, approx. .6 acres	Implement 1 grade stabilization structure, approx. .6 acres	Implement 2 grade stabilization structures, approx. 1.2 acres	# acres # grade stabilizations	$1,160,338	1.97	0.54	0.27
crop	Y	Implement approximately 28.8 acres of forage and biomass planting in the Campbell Creek Subcatchment	Implement 5.8 acres of forage and biomass planting.	Implement 5.8 acres of forage and biomass planting.	Implement 5.8 acres of forage and biomass planting.	Implement 5.8 acres of forage and biomass planting.	Implement 5.8 acres of forage and biomass planting.	# acres planted	$1,938	12.99	2.65	1.32

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Implement approximately 4.39 acres of forage and biomass planting in the Floyd Lake Subcatchment	Implement .88 acres of forage and biomass planting.	Implement .88 acres of forage and biomass planting.	Implement .88 acres of forage and biomass planting.	Implement .88 acres of forage and biomass planting.	Implement .88 acres of forage and biomass planting.	# acres planted	$295	2.02	0.42	0.21
crop	Y	Implement approximately 46.3 acres of forage and biomass planting in the Headwaters Pelican River/Ditch 13 Subcatchment	Implement 9.2 acres of biomass and forage planting.	Implement 9.2 acres of biomass and forage planting.	Implement 9.2 acres of biomass and forage planting.	Implement 9.2 acres of biomass and forage planting.	Implement 9.2 acres of biomass and forage planting.	# acres planted	$3,103	20.69	4.18	2.06
crop	Y	Implement approximately 2 acres of forage and biomass planting in the Little Floyd Lake Subcatchment		Implement 2 acres of biomass and forage planting.				# acres planted	$135	1.68	0.48	0.33
crop	Y	Implement approximately 2 acres of forage and biomass planting in the Sands Lake Subcatchment			Implement 2 acres of biomass and forage planting.			# acres planted	$135	1.15	0.28	0.17
crop	Y	Implement approximately 10.3 acres of drainage water management in the Campbell Creek Subcatchment to reduce sediment loading and erosion and reduce peak flows to improve water quality	Implement 2.1 acres of drainage water management	Implement 2.1 acres of drainage water management	Implement 2.1 acres of drainage water management	Implement 2.1 acres of drainage water management	Implement 2.1 acres of drainage water management	# acres # drainage water management	$86	6.90	1.91	0.94

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Implement approximately 3.8 acres of drainage water management in the Floyd Lake Subcatchment to reduce sediment loading and erosion and reduce peak flows to improve water quality		Implement 1.3 acres of drainage water management		Implement 1.3 acres of drainage water management	Implement 1.2 acres of drainage water management	# acres # drainage water management	$32	2.59	0.72	0.36
crop	Y	Implement approximately 25.9 acres of drainage water management in the Headwaters Pelican River/Ditch 13 Subcatchment to reduce sediment loading and erosion and reduce peak flows to improve water quality	Implement 5.2 acres of drainage water management	Implement 5.2 acres of drainage water management	Implement 5.2 acres of drainage water management	Implement 5.2 acres of drainage water management	Implement 5.2 acres of drainage water management	# acres # drainage water management	$215	0.84	0.23	0.11
crop	Y	Implement approximately 1 acre of drainage water management in the Little Floyd Lake Subcatchment to reduce sediment loading and erosion and reduce peak flows to improve water quality					Implement 1 acres of drainage water management (554)	# acres # drainage water management	$8	1.45	0.48	0.33

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Implement approximately 1 acre of drainage water management in the Sands Lake Subcatchment to reduce sediment loading and erosion and reduce peak flows to improve water quality				Implement 1 acres of drainage water management (554)		# acres # drainage water management	$8	0.99	0.30	0.18
crop	Y	Implement approximately 50.8 acres (25 total) of filter strips in the Campbell Creek Subcatchment	Implement 10.2 acres of filter strips (5 practices)	Implement 10.2 acres of filter strips (5 practices)	Implement 10.2 acres of filter strips (5 practices)	Implement 10.2 acres of filter strips (5 practices)	Implement 10.2 acres of filter strips (5 practices)	# acres # filter strips	$37,777	6.90	1.91	0.94
crop	Y	Implement approximately 2.85 acres (3 total) of filter strips in the Floyd Lake Subcatchment			Implement .95 acres of filter strip (1 practice)	Implement .95 acres of filter strip (1 practice)	Implement .95 acres of filter strip (1 practice)	# acres # filter strips	$2,119	2.59	0.72	0.36
crop	Y	Implement approximately 48.5 acres (26 total) of filter strips in the Headwaters Pelican River/Ditch 13 Subcatchment	Implement 9.7 acres of filter strips (5 practices)	Implement 9.7 acres of filter strips (5 practices)	Implement 9.7 acres of filter strips (5 practices)	Implement 9.7 acres of filter strips (5 practices)	Implement 9.7 acres of filter strips (5 practices)	# filter strips # acres	$36,095	0.84	0.23	0.11
crop	Y	Implement approximately 2 acres (1 total) of filter strips in the Little Floyd Lake Subcatchment.				Implement 2 acres of filter strips (1 practices)		# filter strips # acres	$1,487	1.45	0.48	0.33
crop	Y	Implement approximately 2 acres (1 total) of filter strips in the Sands Lake Subcatchment.					Implement 2 acres of filter strips (1 practices)	# filter strips # acres	$1,487	0.99	0.30	0.18

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Implement approximately 1800 acres of nutrient and manure management in the Campbell Creek Subcatchment	Implement approx. 360 acres of manure/nutrient management	Implement approx. 360 acres of manure/nutrient management	Implement approx. 360 acres of manure/nutrient management	Implement approx. 360 acres of manure/nutrient management	Implement approx. 360 acres of manure/nutrient management	# acres with nutrient and manure management	$18,468	413.37	190.72	0.00
crop	Y	Implement approximately 398 acres of nutrient and manure management in the Floyd Lake Subcatchment	Implement approx. 79.6 acres of manure/nutrient management	Implement approx. 79.6 acres of manure/nutrient management	Implement approx. 79.6 acres of manure/nutrient management	Implement approx. 79.6 acres of manure/nutrient management	Implement approx. 79.6 acres of manure/nutrient management	# acres with nutrient and manure management	$4,078	91.36	42.15	0.00
crop	Y	Implement approximately 1614 acres of nutrient and manure management in the Headwaters Pelican River/Ditch 13 Subcatchment	Implement approx. 322.8 acres of manure/nutrient management	Implement approx. 322.8 acres of manure/nutrient management	Implement approx. 322.8 acres of manure/nutrient management	Implement approx. 322.8 acres of manure/nutrient management	Implement approx. 322.8 acres of manure/nutrient management	# acres with nutrient and manure management	$16,560	11.23	5.18	0.00
crop	Y	Implement approximately 10 acres of nutrient and manure management in the Little Floyd Lake Subcatchment		Implement approx. 10 acres of manure/nutrient management				# acres with nutrient and manure management	$103	2.30	1.06	0.00
crop	Y	Implement approximately 10 acres of nutrient and manure management in the Sands Lake Subcatchment			Implement approx. 10 acres of manure/nutrient management			# acres with nutrient and manure management	$103	5.80	2.60	0.00
crop	Y	Conservation cover planting of 224 acres in the Campbell Creek Subcatchment	Implement 44.8 acres of conservation cover	Implement 44.8 acres of conservation cover	Implement 44.8 acres of conservation cover	Implement 44.8 acres of conservation cover	Implement 44.8 acres of conservation cover	# acres planted	$161,598	100.36	20.44	10.22

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
crop	Y	Conservation cover planting of 49 acres in the Floyd Lakes Subcatchment	Implement 9.8 acres of conservation cover	Implement 9.8 acres of conservation cover	Implement 9.8 acres of conservation cover	Implement 9.8 acres of conservation cover	Implement 9.8 acres of conservation cover	# acres planted	$34,942	22.21	4.59	2.33
crop	Y	Conservation cover planting of 450 acres in the Pelican River-Ditch 13 Subcatchment	Implement 90 acres of conservation cover	Implement 90 acres of conservation cover	Implement 90 acres of conservation cover	Implement 90 acres of conservation cover	Implement 90 acres of conservation cover	# acres planted	$620,163	201.16	40.62	20.07
crop	Y	Conservation cover planting of 2.5 acres in the Little Floyd Lake Subcatchment				Implement 2.55 acres of conservation cover		# acres planted	$1,839	2.14	0.61	0.43
crop	Y	Conservation cover planting of 2.55 acres in the Sands Lake Subcatchment					Implement 2.55 acres of conservation cover	# acres planted	$1,803	1.44	0.35	0.21
crop	Y	Implementation of .17 acres of saturated buffers in the Campbell Creek Subcatchment				Implement .17 acres of saturated buffers		# acres	$139	0.17	0.05	0.02
crop	Y	Implementation of .17 acres of saturated buffers in the Headwaters Pelican River/Ditch 13 Subcatchment					Implement .17 acres of saturated buffers	# acres	$139	0.04	0.01	0.01
Pasture	Y	Critical area planting of 170.3 acres in the Campbell Creek Subcatchment.	Implement 34.06 acres of critical area planting	Implement 34.06 acres of critical area planting	Implement 34.06 acres of critical area planting	Implement 34.06 acres of critical area planting	Implement 34.06 acres of critical area planting	# acres planted	$75,067	73.24	9.43	3.29
Pasture	Y	Critical area planting of 28.95 acres in Floyd Lake Subcatchment	Implement 5.8 acres of critical area planting	Implement 5.8 acres of critical area planting	Implement 5.8 acres of critical area planting	Implement 5.8 acres of critical area planting	Implement 5.8 acres of critical area planting	# acres planted	$12,359	12.53	1.63	0.59

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
Pasture	Y	Critical area planting of 138.03 acres in the Headwaters Pelican River/Ditch 13 Subcatchment	Implement 27.6 acres of critical area planting	Implement 27.6 acres of critical area planting	Implement 27.6 acres of critical area planting	Implement 27.6 acres of critical area planting	Implement 27.6 acres of critical area planting	# acres planted	$60,822	59.15	7.55	2.59
Pasture	Y	Implement on 66 acres cattle exclusion fencing in the Campbell Creek Subcatchment			Exclude cattle access to waters from 33 acres via fencing		Exclude cattle access to waters from 33 acres via fencing	# acres	$4,500	32.72	4.92	1.43
Pasture	Y	Implement on 56 acres cattle exclusion fencing in the Floyd Lake Subcatchment				Exclude cattle access to waters from 28 acres via fencing	Exclude cattle access to waters from 28 acres via fencing	# acres	$4,000	27.68	4.16	1.21
Pasture	Y	Implement on 194 acres cattle exclusion fencing in the Headwaters Pelican River/Ditch 13 Subcatchment			Exclude cattle access to waters from 97 acres via fencing		Exclude cattle access to waters from 97 acres via fencing	# acres	$5,500	96.46	14.5	4.2
Pasture	Y	Implement on 7 acres Heavy Use Protection in the Campbell Creek Subcatchment				Install heavy use protection area within 7 acres		# acres	$5,000	15.04	1.6	0.41
Pasture	Y	Implement on 6 acres Heavy Use Protection in the Floyd Lake Subcatchment					Install heavy use protection area within 6 acres	# acres	$5,000	12.73	1.35	0.35
Pasture	Y	Implement on 21 acres Heavy Use Protection in the Headwaters Pelican River/Ditch 13 Subcatchment					Install heavy use protection area within 21 acres	# acres	$5,000	44.36	4.7	1.22

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
Pasture	Y	Provide alternative water sources on 7 acres in the Campbell Creek Subcatchment				Install alternative water supply within 7 acres		# acres	$13,000	10.72	0.93	0.23
Pasture	Y	Provide alternative water sources on 6 acres in the Floyd Lake Subcatchment					Install alternative water supply within 6 acres	# acres	$13,000	9.07	0.79	0.2
Pasture	Y	Provide alternative water sources on 21 acres in the Headwaters Pelican River/Ditch 13 Subcatchment					Install alternative water supply within 21 acres	# acres	$13,000	31.59	2.75	0.69
Pasture	Y	Provide 1 stream crossing for livestock in the Campbell Creek Subcatchment				Provide 1 stream crossing for livestock		# crossing	$3,000	3.99	0.22	0.05
Pasture	Y	Provide 1 stream crossing for livestock in the Floyd Lake Subcatchment					Provide 1 stream crossing for livestock	# crossing	$3,000	3.38	0.19	0.04
Pasture	Y	Provide 3 stream crossing for livestock in the Headwaters Pelican River/Ditch 13 Subcatchment			Provide 1 stream crossing for livestock	Provide 1 stream crossing for livestock	Provide 1 stream crossing for livestock	# crossing	$9,000	11.76	0.66	0.15
Pasture	Y	Implement approximately 65 acres and explore opportunities for approximately 285 additional acres of prescribed grazing in the Campbell Creek Subcatchment		Implement 65 acres of prescribed grazing practices (Zachariason). Explore opportunities for 285 additional acres of prescribed grazing.	Implement 65 acres of prescribed grazing practices (Zachariason). Explore opportunities for 285 additional acres of prescribed grazing.	Explore opportunities for 285 additional acres of prescribed grazing.	Explore opportunities for 285 additional acres of prescribed grazing.	# acres in prescribed grazing	$3,329	317.70	19.14	5.36

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
Pasture	Y	Explore opportunities for approximately 353 acres of acres of prescribed grazing in the Floyd Lake Subcatchment		Explore opportunities for additional acres of prescribed grazing.	Explore opportunities for additional acres of prescribed grazing.	Explore opportunities for additional acres of prescribed grazing.	Explore opportunities for additional acres of prescribed grazing.	# acres in prescribed grazing	$3,357	320.92	19.61	5.66
Pasture	Y	Implement approximately 7.36 acres of prescribed grazing (3 pastures) in the Headwaters Pelican River/Ditch 13 Subcatchment		Implement 3.24 acres of prescribed grazing	Implement 2.93 acres of prescribed grazing	Implement 1.19 acres of prescribed grazing	Explore opportunities for additional acres of prescribed grazing.	# acres in prescribed grazing	$70	6.66	0.40	0.11
feedlot	Y*	Install one waste management system such as a manure storage structure or feedlot runoff controls at a feedlot in the Campbell Creek Subcatchment		Implement one feedlot waste management system				# waste management systems	$160,000	2925.87	658.32	0.00
feedlot	Y*	Install one waste management system such as a manure storage structure or feedlot runoff controls at a feedlot in the Floyd Lake Subcatchment				Implement one feedlot waste management system		# waste management systems	$160,000	965.54	217.25	0.00

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
feedlot	Y*	Install one waste management system such as a manure storage structure or feedlot runoff controls at a feedlot in the Headwaters Pelican River/Ditch 13 Subcatchment			Implement one feedlot waste management system			# waste management systems	$160,000	8777.62	1974.96	0.00
feedlot	Y*	Properly clean out or "close" one inactive, unused feedlot or manure storage area in the Campbell Creek Subcatchment					Complete one feedlot or manure storage area closure	# feedlot or manure storage closures	$20,000	2925.87	658.32	0.00
feedlot	Y*	Properly clean out or "close" one inactive, unused feedlot or manure storage area in the Floyd Lake Subcatchment			Complete one feedlot or manure storage area closure			# feedlot or manure storage closures	$20,000	965.54	217.25	0.00
feedlot	Y*	Properly clean out or "close" one inactive, unused feedlot or manure storage area in the Headwaters Pelican River/Ditch 13 Subcatchment				Complete one feedlot or manure storage area closure		# feedlot or manure storage closures	$20,000	8777.62	1974.96	0.00

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
cost share	Y*	Maintain a cost-share program to help private landowners implement voluntary stormwater BMPs (e.g. rain gardens, natural lakeshore vegetation) which improve surface and ground water quality, reduce runoff, and provide pollinator and wildlife habitat.	Fund at least one voluntary BMP implementation project per year.	Fund at least one voluntary BMP implementation project per year.	Fund at least one voluntary BMP implementation project per year.	Fund at least one voluntary BMP implementation project per year.	Fund at least one voluntary BMP implementation project per year.	# practices funded and installed	$200,000			
cost share	Y	Maintain a cost-share program to help farmers install agricultural volume reduction BMPs (e.g. water and sediment control basins [WASCOBs], controlled drainage) which improve surface and ground water quality, reduce runoff, and provide pollinator and wildlife habitat. (Cropland practices specified above)					Provide funding for at least five agriculture BMP projects from 2023-2032	# BMPs funded and installed	$250,000			
cost share	N	Explore opportunities for a cost-share program or low-interest revolving loan program that offers rebates to residents who bring septic systems up to code.	Explore cost-share or loan program.	Explore cost-share or loan program.	Explore cost-share or loan program.			# hours staff time spent; programs created	$5,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
cost share	Y	Maintain a cost-share program for stream and lakeshore landowners to convert shoreline turf grass, rip rap, and/or seawalls into lake- or stream-friendly vegetated buffers, which tolerate fluctuating water levels while reducing runoff and erosion and providing aquatic, wildlife, and pollinator habitat.					Provide cost-share for at least five shoreline lake and stream buffer conversion projects from 2023-2032	# projects funded and installed	$50,000			
outreach	Y	Distribute MDH and MPCA materials about safe consumption of fish through at least two social media posts and/or flyers per year, with a focus on lakes that are impaired due to mercury in fish tissue (Floyd, Little Floyd, and Mud (North Floyd) Lakes).	Make two social media posts and/or flyers per year.	Make two social media posts and/or flyers per year.	Make two social media posts and/or flyers per year.	Make two social media posts and/or flyers per year.	Make two social media posts and/or flyers per year.	# media posts and/or flyers per year	$1,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
outreach	Y	Act as an information source to identify PRWD and potential external financial and technical assistance such as grants, loans, and cost-share programs for well and septic system work, stormwater BMPs, agricultural BMPs, and natural shoreline restorations.	Provide information for potential financial and technical assistance.	Provide information for potential financial and technical assistance.	Provide information for potential financial and technical assistance.	Provide information for potential financial and technical assistance.	Provide information for potential financial and technical assistance.	# information requests completed/financial or technical assistance provided	$1,500			
outreach	Y	In conjunction with Becker County, educate, at least once per year, about proper septic system tank management maintenance and the effects of failing septic systems on drinking water through flyers, booklets, newsletters, social media, or local television, or at local events or workshops.	Provide septic system education, at least once per year, through flyers, booklets, newsletters, social media, or local television, local events, or workshops.	Provide septic system education, at least once per year, through flyers, booklets, newsletters, social media, or local television, or at local events or workshops.	Provide septic system education, at least once per year, through flyers, booklets, newsletters, social media, or local television, or at local events or workshops.	Provide septic system education, at least once per year, through flyers, booklets, newsletters, social media, or local television, or at local events or workshops.	Provide septic system education, at least once per year, through flyers, booklets, newsletters, social media, or local television, or at local events or workshops.	# information items provided	$1,500			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
outreach	N	Assist Becker County and local SWCDs, at least once per year, in promoting proper management of private wells through flyers, booklets, newsletters, social media, or local television, local events, or workshops.	Provide private well education, at least once per year, through flyers, booklets, newsletters, social media, or local television, local events, or workshops.	Provide private well education, at least once per year, through flyers, booklets, newsletters, social media, or local television, local events, or workshops.	Provide private well education, at least once per year, through flyers, booklets, newsletters, social media, or local television, local events, or workshops.	Provide private well education, at least once per year, through flyers, booklets, newsletters, social media, or local television, local events, or workshops.	Provide private well education, at least once per year, through flyers, booklets, newsletters, social media, or local television, local events, or workshops.	# information items provided	$1,500			
outreach	Y	Assist the City of Detroit Lakes, at least once per year, in educating residents about wellhead protection and BMPs through utility bill inserts, newsletters, the District website, and social media.	Provide wellhead protection and BMP education at least once per year.	Provide wellhead protection and BMP education at least once per year.	Provide wellhead protection and BMP education at least once per year.	Provide wellhead protection and BMP education at least once per year.	Provide wellhead protection and BMP education at least once per year.	# information items provided	$1,500			
outreach	Y	Increase efficiency of agricultural water use by contacting two agricultural landowners about sustainable water practices.		Contact at least 1 agricultural landowner	Contact at least 1 agricultural landowner			Contact made	$2,000			
outreach	Y	Assist with advertising irrigation workshops and other groundwater-related workshops sponsored by the MDA, Becker County SWCD and Otter Tail County SWCD.	Assist with at least one workshop as applicable.	Assist with at least one workshop as applicable.	Assist with at least one workshop as applicable.	Assist with at least one workshop as applicable.	Assist with at least one workshop as applicable.	Workshop(s) completed	$2,000		`	

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
outreach	Y	Continue to attend and present at aquatic invasive species (AIS) workshops and conferences.	Attend and consider presenting for at least one AIS workshop or conference.	Attend and consider presenting for at least one AIS workshop or conference.	Attend and consider presenting for at least one AIS workshop or conference.	Attend and consider presenting for at least one AIS workshop or conference.	Attend and consider presenting for at least one AIS workshop or conference.	Workshop(s) attended	$15,000			
outreach	N	Continue communications and develop a research partnership with University of Minnesota's AIS Center and other institutions.	Communicate with AIS Center staff yearly.	Communicate with AIS Center staff yearly.	Communicate with AIS Center staff yearly.	Communicate with AIS Center staff yearly.	Communicate with AIS Center staff yearly.	Communication completed	$75,000			
outreach	Y	Encourage wildlife and pollinator-friendly seed mixes and plantings in buffers or linear projects.	Encourage wildlife and pollinator friendly seed mixes in every permit review.	Encourage wildlife and pollinator friendly seed mixes in every permit review.	Encourage wildlife and pollinator friendly seed mixes in every permit review.	Encourage wildlife and pollinator friendly seed mixes in every permit review.	Encourage wildlife and pollinator friendly seed mixes in every permit review.	Recommendations taken	$5,000			
outreach	Y	Sponsor regular events to facilitate exchange of practical information.	Sponsor at least one event per year.	Sponsor at least one event per year.	Sponsor at least one event per year.	Sponsor at least one event per year.	Sponsor at least one event per year.	# events sponsored	$100,000			
outreach	Y	Continually update the District's website and social media pages.	Complete annual website updates and monthly social media posts.	Complete annual website updates and monthly social media posts.	Complete annual website updates and monthly social media posts.	Complete annual website updates and monthly social media posts.	Complete annual website updates and monthly social media posts.	# posts and updates	$30,000			
outreach	Y	Continue District education efforts, including regular social media posts, monthly radio interviews, school events, talks, mailings.	Continue education efforts including 1-2 social media posts per month, monthly radio interviews, and 3-5 school events per year.	Continue education efforts including 1-2 social media posts per month, monthly radio interviews, and 3-5 school events per year.	Continue education efforts including 1-2 social media posts per month, monthly radio interviews, and 3-5 school events per year.	Continue education efforts including 1-2 social media posts per month, monthly radio interviews, and 3-5 school events per year.	Continue education efforts including 1-2 social media posts per month, monthly radio interviews, and 3-5 school events per year.	# events and posts	$20,000			
outreach	Y	Post educational signs at the Rice Lake Wetland restoration project.	Post signs.					# signs installed	$5,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
outreach	N	Add stormwater facility info. to District website.	Provide and update stormwater info on District website.	Provide and update stormwater info on District website.	Provide and update stormwater info on District website.	Provide and update stormwater info on District website.	Provide and update stormwater info on District website.	Website updates completed	$2,000			
outreach	Y	Conduct door-to-door outreach two days per year for education and on-site phosphorus reduction assessments.	Two days of outreach per year.	Two days of outreach per year.	Two days of outreach per year.	Two days of outreach per year.	Two days of outreach per year.	# outreach events	$20,000			
outreach	Y	Hold two rain garden/rain barrel workshops (once every three years).		Hold workshop (2024)	Hold workshop (2027)			Workshop(s) completed	$3,000			
outreach	Y	Post signage to identify lakes, streams, and high-quality wetlands in the Headwaters of the Pelican River Watershed.		Post signage at priority waters.	Post signage at priority waters.	Post signage at priority waters.		# signs installed	$5,000			
outreach	Y	Conduct one phosphorus reduction, stormwater, or ecosystem health BMP workshop for stakeholders every other year.	Conduct biennial workshop.	Conduct biennial workshop.	Conduct biennial workshop.	Conduct biennial workshop.	Conduct biennial workshop.	Workshop(s) completed	$10,000			
outreach	Y	Put District water monitoring and other data on website and social media.	Upload data to website yearly.	Upload data to website yearly.	Upload data to website yearly.	Upload data to website yearly.	Upload data to website yearly.	Website updates completed	$2,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
administration	N	As the local drainage authority, maintain 100% compliance with the Minnesota Buffer Law district-wide to reduce erosion and runoff and to provide wildlife habitat.	Maintain 100% compliance with the Minnesota Buffer Law through ditch inspections, permit application reviews, and enforcement of district rules.	Maintain 100% compliance with the Minnesota Buffer Law through ditch inspections, permit application reviews, and enforcement of district rules.	Maintain 100% compliance with the Minnesota Buffer Law through ditch inspections, permit application reviews, and enforcement of district rules.	Maintain 100% compliance with the Minnesota Buffer Law through ditch inspections, permit application reviews, and enforcement of district rules.	Maintain 100% compliance with the Minnesota Buffer Law through ditch inspections, permit application reviews, and enforcement of district rules.	% compliance # inspections, application reviews, or enforcement actions	$30,000			
administration	N	Reduce atmospheric mercury deposition by supporting legislative initiatives which reduce mercury emissions.	At least one letter to government representatives, two social media posts or one other acknowledgement of support over ten years.	At least one letter to government representatives, two social media posts or one other acknowledgement of support over ten years.	At least one letter to government representatives, two social media posts or one other acknowledgement of support over ten years.	At least one letter to government representatives, two social media posts or one other acknowledgement of support over ten years.	At least one letter to government representatives, two social media posts or one other acknowledgement of support over ten years.	# letters, media posts, or other acknowledgements	$1,000			
administration	N	Identify and explore opportunities to protect high quality wetlands through easements, fee title or wetland bank.	Explore and secure wetland protection opportunities.	Explore and secure wetland protection opportunities.	Explore and secure wetland protection opportunities.	Explore and secure wetland protection opportunities.	Explore and secure wetland protection opportunities.	# opportunities secured	$25,000			
administration	Y	Help implement wetland requirements such as buffers, setbacks, and pretreatment of stormwater prior to discharge into wetlands.	Assist with implementation of at least one requirement over ten years.	Assist with implementation of at least one requirement over ten years.	Assist with implementation of at least one requirement over ten years.	Assist with implementation of at least one requirement over ten years.	Assist with implementation of at least one requirement over ten years.	# implemented	$5,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
administration	Y	Implement infiltration and other groundwater protection BMPs according to the City of Detroit Lakes Wellhead Protection Plan within the Headwaters Pelican River/Ditch 13 Subcatchment.	Implement infiltration and other groundwater BMPs.	Implement infiltration and other groundwater BMPs.	Implement infiltration and other groundwater BMPs.	Implement infiltration and other groundwater BMPs.	Implement infiltration and other groundwater BMPs.	# BMPs funded and installed # projects violating plan	$1,500			
administration	N	Meet with City of Detroit Lakes staff to review and implement FEMA flood insurance rate maps, flood insurance studies and Atlas 14 data in order to prevent loss of flood storage capacity or filling in the floodplain within the Headwaters of the Pelican River Watershed and downstream.	Completion of FEMA Flood Insurance study including City of Detroit Lakes.	Implement FEMA flood insurance study findings.	Implement FEMA flood insurance study findings.	Implement FEMA flood insurance study findings.	Implement FEMA flood insurance study findings.	Study completed # practices implemented	$2,500			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
administration	Y	Develop and implement design standards for bridges, culverts, or other water-related infrastructure to ensure integrity of road system and infrastructure while maintaining hydrologic connectivity where needed within the Headwaters of the Pelican River Watershed and downstream.	Ensure all bridges, culverts, or other water-related infrastructure is replaced according to standards.	Ensure all bridges, culverts, or other water-related infrastructure is replaced according to standards.	Ensure all bridges, culverts, or other water-related infrastructure is replaced according to standards.	Ensure all bridges, culverts, or other water-related infrastructure is replaced according to standards.	Ensure all bridges, culverts, or other water-related infrastructure is replaced according to standards.	Standards developed	$2,000			
administration	N	Develop an Emergency Response Plan for flood-prone areas within the Headwaters of the Pelican River Watershed and downstream with Becker and Otter Tail Counties and the City of Detroit Lakes.	Develop Emergency Response Plan					Plan developed	$15,000			
administration	N	Review Conditional Use Permits, Environmental Assessment Worksheets and Environmental Impact Statements for projects involving groundwater through the Becker County TAC.	Fulfill Becker County technical advisory committee responsibilities (e.g., attend meetings, review permits, etc.).	Fulfill Becker County technical advisory committee responsibilities (e.g., attend meetings, review permits, etc.).	Fulfill Becker County technical advisory committee responsibilities (e.g., attend meetings, review permits, etc.).	Fulfill Becker County technical advisory committee responsibilities (e.g., attend meetings, review permits, etc.).	Fulfill Becker County technical advisory committee responsibilities (e.g., attend meetings, review permits, etc.).	# projects reviewed	$20,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
administration	Y	Prevent infestation of flowering rush and curly-leaf pondweed in lakes within the Headwaters of the Pelican River Watershed.	Provide AIS education through flyers, booklets, newsletters, social media, and local television.	Provide AIS education through flyers, booklets, newsletters, social media, and local television.	Provide AIS education through flyers, booklets, newsletters, social media, and local television.	Provide AIS education through flyers, booklets, newsletters, social media, and local television.	Provide AIS education through flyers, booklets, newsletters, social media, and local television.	# AIS education activities	$1,500			
administration	Y	Develop readiness response plans for priority AIS for lakes within the Headwaters of the Pelican River Watershed and downstream.	Complete Rapid Response Plan document for one priority AIS (e.g. flowering rush, curly-leaf pondweed, zebra mussels, Chinese Mystery Snails, etc.)	Complete Rapid Response Plan document for one priority AIS (e.g. flowering rush, curly-leaf pondweed, zebra mussels, Chinese Mystery Snails, etc.)	Complete Rapid Response Plan document for one priority AIS (e.g. flowering rush, curly-leaf pondweed, zebra mussels, Chinese Mystery Snails, etc.)	Complete Rapid Response Plan document for one priority AIS (e.g. flowering rush, curly-leaf pondweed, zebra mussels, Chinese Mystery Snails, etc.)	Complete Rapid Response Plan document for one priority AIS (e.g. flowering rush, curly-leaf pondweed, zebra mussels, Chinese Mystery Snails, etc.)	# plans completed	$200,000			
administration	Y	Provide readiness response treatments if necessary.	Implement invasive species Rapid Response Plan, if necessary, for any new AIS infestation.	Implement invasive species Rapid Response Plan, if necessary, for any new AIS infestation.	Implement invasive species Rapid Response Plan, if necessary, for any new AIS infestation.	Implement invasive species Rapid Response Plan, if necessary, for any new AIS infestation.	Implement invasive species Rapid Response Plan, if necessary, for any new AIS infestation.	# treatments	$5,000,000			
administration	Y	Manage AIS on Big Floyd, Little Floyd, and Mud (North Floyd) lakes, and any other waters within the Headwaters of the Pelican River Watershed that may become infested, using methods devised by the University of Minnesota and other AIS experts.	Manage AIS infestations using methods devised by the University of Minnesota and other AIS experts.	Manage AIS infestations using methods devised by the University of Minnesota and other AIS experts.	Manage AIS infestations using methods devised by the University of Minnesota and other AIS experts.	Manage AIS infestations using methods devised by the University of Minnesota and other AIS experts.	Manage AIS infestations using methods devised by the University of Minnesota and other AIS experts.	# AIS activities	$1,000,000			
administration	Y	Prevent habitat degradation and fragmentation within the Headwaters of the Pelican River Watershed through conversations with MDNR staff.	Yearly communication with MDNR about habitat degradation and fragmentation.	Yearly communication with MDNR about habitat degradation and fragmentation.	Yearly communication with MDNR about habitat degradation and fragmentation.	Yearly communication with MDNR about habitat degradation and fragmentation.	Yearly communication with MDNR about habitat degradation and fragmentation.	# communications	$5,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
administration	Y	Incorporate fish spawning areas into projects within the Headwaters of the Pelican River Watershed when feasible.	Review projects for fish spawning habitat.	Review projects for fish spawning habitat.	Review projects for fish spawning habitat.	Review projects for fish spawning habitat.	Review projects for fish spawning habitat.	# projects reviewed # spawning areas installed	$5,000			
administration	N	Assist the MDNR in replacing the weir on Little Floyd Lake with rock rapids.	Assist in weir replacement.	Assist in weir replacement.				Weir replaced	$25,000			
administration	N	Enhance local intra-agency administration effectiveness through meetings, agreements, procedures, etc.	At least three enhancement activities per year.	At least three enhancement activities per year.	At least three enhancement activities per year.	At least three enhancement activities per year.	At least three enhancement activities per year.	# enhancement activities	$10,000			
administration	N	Identify and implement solutions to streamline permit application process.	Implement at least three streamlining strategies in ten years.	Implement at least three streamlining strategies in ten years.	Implement at least three streamlining strategies in ten years.	Implement at least three streamlining strategies in ten years.	Implement at least three streamlining strategies in ten years.	# strategies	$50,000			
administration	N	Develop software to facilitate permitting process.		Develop and implement permitting software.				software implemented	$45,000			
administration	Y	Utilize a Technical Advisory Committee.	Hold TAC meetings monthly or as needed.	Hold TAC meetings monthly or as needed.	Hold TAC meetings monthly or as needed.	Hold TAC meetings monthly or as needed.	Hold TAC meetings monthly or as needed.	# meetings	$5,000			
administration	N	Develop a stormwater certification program for contractors and developers to raise awareness of regulations, rules, and ordinances.	Develop certification program and certify at least five contractors in ten years.	Develop certification program and certify at least five contractors in ten years.	Develop certification program and certify at least five contractors in ten years.	Develop certification program and certify at least five contractors in ten years.	Develop certification program and certify at least five contractors in ten years.	Program developed # contractors certified	$10,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
administration	Y	Provide technical input to development projects to protect surface water and groundwater.	Review all applicable projects for protection of surface water and groundwater.	Review all applicable projects for protection of surface water and groundwater.	Review all applicable projects for protection of surface water and groundwater.	Review all applicable projects for protection of surface water and groundwater.	Review all applicable projects for protection of surface water and groundwater.	# projects reviewed	$2,000			
administration	N	Refine rules to restrict new developments from increasing rate or volume of runoff leaving a site.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			
administration	N	Refine rules to prevent building or filling in the 100-year floodplain.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			
administration	N	Ensure that rules support the Becker County and Detroit Lakes shoreland ordinances, the MS4 Ordinance and the City of Detroit Lakes WHPP.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			
administration	N	Ensure that rules reflect Minnesota Buffer Law enforcement responsibilities.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			
administration	N	Consider developing rules to require wetland buffers and/or setbacks.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			
administration	N	Consider developing rules to protect groundwater.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
administration	N	Consider adopting and enforcing a standard for minimum low floor elevation of buildings that is greater or more stringent than what is required in the current Becker County Zoning Ordinance.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			
administration	N	Consider a filtration requirement for wellhead protection areas.	Develop new or refined rules.	Develop new or refined rules.				rules/standards implemented	$1,875			
study	N	Conduct additional feasibility studies for lakeshed and in-lake management practices and update lake-specific management plans using the Otter Tail River WRAPS report data for Headwaters of the Pelican River Watershed general development lakes to achieve necessary nutrient reductions and water quality goals.	Update plans for Floyd, Little Floyd, and Mud (North Floyd) Lakes	Update plans for Floyd, Little Floyd, and Mud (North Floyd) Lakes				# of updated plans	$50,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
study	Y	Assess internal phosphorus loading in Mud (North Floyd) Lake and perform alum treatments or other appropriate practices to reduce loading.		Completion of internal phosphorus loading study (e.g. sediment core study), and if appropriate, completion of an alum treatment or other practices.	Completion of internal phosphorus loading study (e.g. sediment core study), and if appropriate, completion of an alum treatment or other practices.			Assessment complete, treatment practice(s) complete; # lbs/yr TP reduction post treatment	$750,000			
study	N	Conduct at least two shoreline surveys per lake with potential for increased development within the Floyd Lakes subwatershed: Floyd Lake (including Mud (North Floyd)), Little Floyd Lake, Sands Lake.		Shoreline survey Sands Lake	Shoreline survey Floyd Lake (Big and Mud (North Floyd)) & Little Floyd Lake (to be done in 2026)	Shoreline survey Sands Lake (second-to be done in 2030)	Shoreline survey Floyd Lake (Big and Mud (North Floyd)) & Little Floyd Lake (second)	# surveys	$15,000			
study	N	Identify areas in the Floyd Lake and Headwaters Pelican River/Ditch 13 Subcatchments that need stormwater BMPs retrofitted or installed, and alert landowners about the District's cost-share assistance and technical assistance programs.	Contact at least three landowners per year about BMP retrofit or installation projects.	Contact at least three landowners per year about BMP retrofit or installation projects.	Contact at least three landowners per year about BMP retrofit or installation projects.	Contact at least three landowners per year about BMP retrofit or installation projects.	Contact at least three landowners per year about BMP retrofit or installation projects.	# landowners contacted, projects implemented	$10,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
study	N	Conduct a systematic wetland inventory throughout the Headwaters of the Pelican River Watershed that identifies, functionally assesses, and prioritizes wetlands for protection and restoration.		Completion of wetland inventory	Completion of wetland inventory	Completion of wetland inventory		inventory completed	$50,000			
study	N	Evaluate the potential for improving geomorphology of approximately 3,400 linear feet of the Pelican River between MN Highway 34 and US Highway 10 (Headwaters Pelican River/Ditch 13 Subcatchment).		Complete evaluation and restoration feasibility study.	Complete evaluation and restoration feasibility study.	Complete evaluation and restoration feasibility study.		Evaluation completed	$850,000			
study	N	Develop or compile inventories for irrigation wells and areas of high groundwater sensitivity in the Headwaters of the Pelican River Watershed.		Develop or compile inventories	Develop or compile inventories			inventory completed	$2,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
study	N	Conduct a hydrologic modeling study to identify flood prone areas, potential damages and critical infrastructure that may need updates.	Completion of hydrologic modeling study and reporting.					Study completed	$230,000			
study	N	Identify and preserve critical area necessary for the conveyance or temporary storage of stormwater runoff within the Headwaters of the Pelican River Watershed.		Identify and preserve critical stormwater areas.	Identify and preserve critical stormwater areas.			Study completed	$5,000			
study	N	Explore opportunities for potential cisterns or water reuse systems in the Headwaters of the Pelican River Watershed and downstream.	Explore opportunities for water reuse.	Explore opportunities for water reuse.				Study completed	$5,000			
study	N	Survey submerged aquatic vegetation, including AIS, on Big Floyd, Mud (North Floyd), and Little Floyd Lakes, and other Headwaters of the Pelican River Watershed waters as needed.		Aquatic vegetation survey for Big Floyd, Mud (North Floyd), and Little Floyd Lakes			Aquatic vegetation survey for Big Floyd, Mud (North Floyd), and Little Floyd Lakes (to be done in 2030)	Surveys completed	$150,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
study	N	Through the Otter Tail WRAPS Cycle 2, assess Campbell Creek (Campbell Creek Subcatchment) and Pelican River (Headwaters Pelican River/Ditch 13 Subcatchment) for index of biological integrity (IBI).		Submit requests for Campbell Creek and Pelican River Fish and Macroinvertebrate IBI monitoring to MPCA through the "State and Local Needs" process.	Complete fish and macroinvertebrate IBI monitoring as part of MPCA's Intensive Watershed Monitoring.			IBI evaluations completed	$100,000			
study	N	Conduct a feasibility study to prioritize stream ecosystem connectivity practices for streams within the Headwaters of the Pelican River Watershed that have been identified through the MDNR's culvert and barrier inventory for the Otter Tail River Watershed, and through the Otter Tail River WRAPS and 1W1P.	Complete connectivity feasibility studies.	Complete connectivity feasibility studies.	Complete connectivity feasibility studies.			Studies completed	$100,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
study	N	Implement the priority recommendations from the river ecosystem connectivity feasibility studies for streams within the Headwaters of the Pelican River Watershed identified as having connectivity issues.			Implement connectivity practices such as removal of beaver dams, replacement of mis-sized culverts, and other fish passage practices.	Implement connectivity practices such as removal of beaver dams, replacement of mis-sized culverts, and other fish passage practices.	Implement connectivity practices such as removal of beaver dams, replacement of mis-sized culverts, and other fish passage practices.	# practices implemented	$100,000			
study	N	Perform a baseline resource risk analysis of targeted lakesheds within the Headwaters of the Pelican River Watershed.		Determine targeted lakesheds and complete resource risk analysis.	Determine targeted lakesheds and complete resource risk analysis.	Determine targeted lakesheds and complete resource risk analysis.		Analysis completed	$250,000			
study	N	Develop and maintain inventory of District-owned or financed stormwater management facilities within the Headwaters of the Pelican River Watershed.	Develop stormwater facility inventory.	Develop stormwater facility inventory.				inventory completed	$30,000			
study	Y	Pilot a phosphorus/ runoff reduction outreach program for targeted properties in the Headwaters of the Pelican River Watershed with the greatest phosphorus load and runoff volume reduction potential.			Target at least one property in the Headwaters of the Pelican River Watershed.	Target at least one property in the Headwaters of the Pelican River Watershed.	Target at least one property in the Headwaters of the Pelican River Watershed.	Program developed # properties	$20,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
monitor	Y*	Monitor a minimum of two existing agricultural BMPs per year in the Campbell Creek and Floyd Lake Subcatchments, with a visual assessment and three water quality samples each, to evaluate phosphorus and sediment removal efficiency.	Monitor at least two installed agricultural BMP locations per year, with a visual assessment and at least three water quality samples for each BMP location.	Monitor at least two installed agricultural BMP locations per year, with a visual assessment and at least three water quality samples for each BMP location.	Monitor at least two installed agricultural BMP locations per year, with a visual assessment and at least three water quality samples for each BMP location.	Monitor at least two installed agricultural BMP locations per year, with a visual assessment and at least three water quality samples for each BMP location.	Monitor at least two installed agricultural BMP locations per year, with a visual assessment and at least three water quality samples for each BMP location.	# monitoring sites # samples # visual assessments	$25,000			
monitor	Y*	Continue the District's annual chemical water quality monitoring program to assess lake health, guide adaptive management, and provide measures of progress.	Annual WQ monitoring: Big Floyd, Mud (North Floyd), & Little Floyd lakes; Periodic WQ monitoring: Brandy, Fish, Kennedy, St. Patrick, & Sands Lakes (2022), Schultz & Tamarack Lakes (2023)	Annual WQ monitoring: Big Floyd, Mud (North Floyd), & Little Floyd lakes; Periodic WQ monitoring: Oak Lake (2025); Campbell Lake (2026)	Annual WQ monitoring: Big Floyd, Mud (North Floyd), & Little Floyd lakes; Periodic WQ monitoring: Brandy, Fish, Kennedy, St. Patrick, & Sands Lakes (2027); Schultz & Tamarack Lakes (2028).	Annual WQ monitoring: Big Floyd, Mud (North Floyd), & Little Floyd lakes; Periodic WQ monitoring: Oak Lake (2030).	Annual WQ monitoring: Big Floyd, Mud (North Floyd), & Little Floyd lakes; Periodic WQ monitoring: Campbell Lake (2031); Brandy, Fish, Kennedy, St. Patrick, & Sands Lakes (2032).	Completion of annual monitoring report	$400,000			
monitor	Y*	Update all annual stream monitoring plans to include assessment of chemical water quality parameters and flow at minimum, but also bank erosion and runoff when possible.	Complete annual water quality monitoring: Campbell Creek/Ditch 11-12 (Campbell Creek Subcatchment) & Pelican River/Ditch 13 (Headwaters Pelican River/Ditch 13 Subcatchment).	Complete annual water quality monitoring: Campbell Creek/Ditch 11-12 (Campbell Creek Subcatchment) & Pelican River/Ditch 13 (Headwaters Pelican River/Ditch 13 Subcatchment).	Complete annual water quality monitoring: Campbell Creek/Ditch 11-12 (Campbell Creek Subcatchment) & Pelican River/Ditch 13 (Headwaters Pelican River/Ditch 13 Subcatchment).	Complete annual water quality monitoring: Campbell Creek/Ditch 11-12 (Campbell Creek Subcatchment) & Pelican River/Ditch 13 (Headwaters Pelican River/Ditch 13 Subcatchment).	Complete annual water quality monitoring: Campbell Creek/Ditch 11-12 (Campbell Creek Subcatchment) & Pelican River/Ditch 13 (Headwaters Pelican River/Ditch 13 Subcatchment).	Completion of annual monitoring report	$10,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
monitor	Y*	Maintain water level gauges at lake outlets and at key locations in several streams, including Campbell Creek/Ditch 11-12 (Campbell Creek Subcatchment) and Pelican River/Ditch 13 (Headwaters Pelican River/Ditch 13 Subcatchment).	Maintain water level gauges and collect weekly readings during ice-off season.	Maintain water level gauges and collect weekly readings during ice-off season.	Maintain water level gauges and collect weekly readings during ice-off season.	Maintain water level gauges and collect weekly readings during ice-off season.	Maintain water level gauges and collect weekly readings during ice-off season.	Data collected	$2,000			
monitor	Y*	Conduct annual drainage system inspection reports for Drainage Systems 11-12, and 13.	Complete annual drainage inspection reports.	Complete annual drainage inspection reports.	Complete annual drainage inspection reports.	Complete annual drainage inspection reports.	Complete annual drainage inspection reports.	completion of annual report.	$10,000			
monitor	Y*	Develop and implement a drainage system records modernization program.		Develop drainage records database.	Develop drainage records database.			Program developed	$50,000			
monitor	Y*	Complete annual inspections of boat access points and additional areas for starry stonewort or other new AIS.	Complete annual AIS inspections at access points while conducting annual water quality monitoring.	Complete annual AIS inspections at access points while conducting annual water quality monitoring.	Complete annual AIS inspections at access points while conducting annual water quality monitoring.	Complete annual AIS inspections at access points while conducting annual water quality monitoring.	Complete annual AIS inspections at access points while conducting annual water quality monitoring.	# inspections	$1,000			
monitor	Y*	Develop an assessment program to identify priority areas (stream reaches, lakes, wetlands) for aquatic habitat protection within the Headwaters of the Pelican River Watershed.		Develop assessment program as opportunities arise.	Develop assessment program as opportunities arise.			Program developed # priority areas	$15,000			

Type	319 eligibility	BMP/Activity	Milestones					Assessment	Cost	Estimated reductions		
			2-year (2024)	4-year (2026)	6-year (2028)	8-year (2030	10 year (2032)			N lbs/yr	TP lb/yr	TSS t/yr
monitor	Y*	Develop data reports to convey resource conditions and trends.	Produce annual monitoring report and two educational materials from this report.	Produce annual monitoring report and two educational materials from this report.	Produce annual monitoring report and two educational materials from this report.	Produce annual monitoring report and two educational materials from this report.	Produce annual monitoring report and two educational materials from this report.	Reports completed	$10,000			
Total									**$33,177,439**	**58170.98**	**11699.68**	**2419.74**

Element a. sources identified

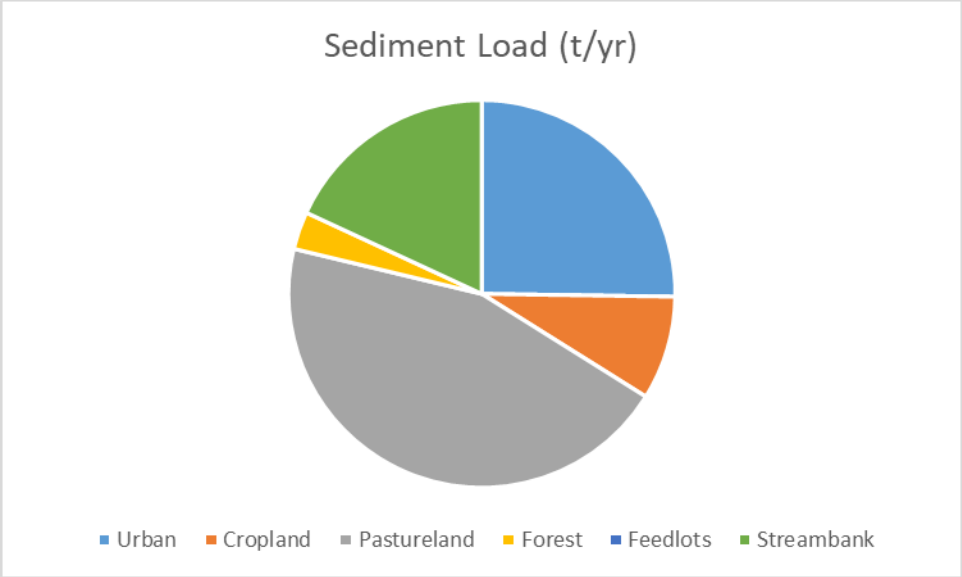
An identification of the causes and sources or groups of similar sources that will need to be controlled to achieve the load reductions estimated in this watershed-based plan (and to achieve any other watershed goals identified in the watershed-based plan), as discussed in item (b) immediately below. Sources that need to be controlled should be identified at the significant subcategory level with estimates of the extent to which they are present in the watershed (e.g., X numbers of dairy cattle feedlots needing upgrading, including a rough estimate of the number of cattle per facility; Y acres of row crops needing improved nutrient management or sediment control; or Z linear miles of eroded streambank needing remediation).

EPA Handbook for Restoring and Protecting Our Waters

The detailed sources of pollution in the Headwaters of the Pelican River Watershed are described in the *PRWD Comprehensive Watershed Management Plan* (PRWD, 2020a), *Otter Tail River Watershed Restoration and Protection Strategy (WRAPS) Report* (MPCA, 2021b), and OTCWMP (PRWD, 2023a). For ease of the user of this supplement the following summary is provided. Sources by land use were calculated for this summary using the EPA's Pollutant Load Estimation Tool (PLET, EPA, 2022).

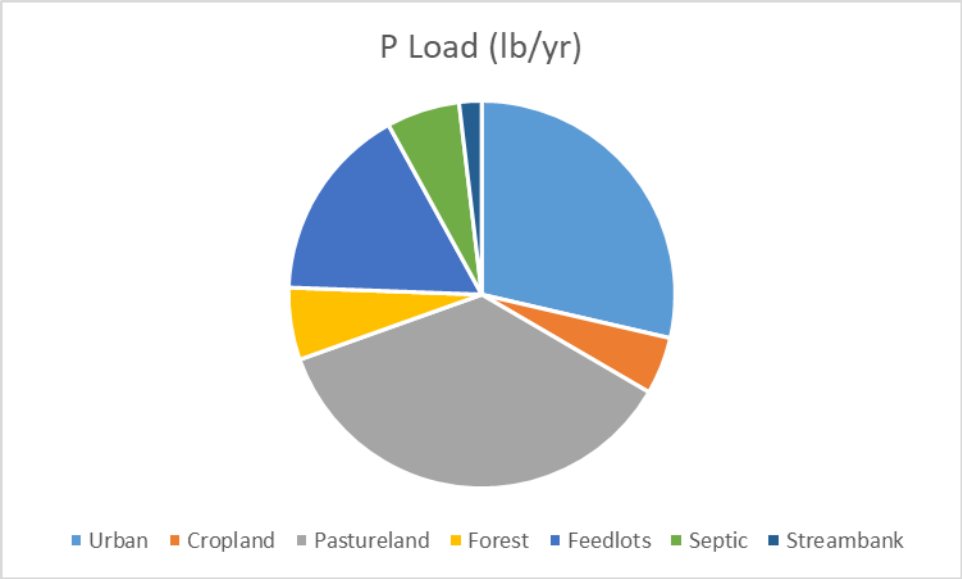
The sources of TSS by land use are illustrated in Figure 5. The critical loading points are from pastures with animals directly accessing the streambanks, streambank erosion in Campbell Creek and the Pelican River, and lakeshore alterations and developed areas (stormwater) around Floyd, Mud (North Floyd), and Little Floyd Lakes and within the City of Detroit Lakes along the Pelican River.

Figure 5. Summary of TSS loading in the Headwaters of the Pelican River Watershed (EPA, 2022).



The loading sources of phosphorus by land use are illustrated in Figure 6. The critical sources of both phosphorus and nitrogen are from pastures with animals directly accessing the streambanks, lakeshore alterations and developed areas (stormwater) around Floyd, Mud (North Floyd), and Little Floyd Lakes and within the City of Detroit Lakes, and from runoff from livestock feedlots.

Figure 6. Summary of Phosphorus loading in the Headwaters of the Pelican River Watershed (EPA, 2022).



Streambank instability and erosion

Campbell Creek is impaired by total suspended solids (TSS) caused by streambank and overland erosion, and by ditching and straightening in the early 1900s and modern increases in tile drainage. Portions of the Pelican River are also identified as unstable due to some of the same reasons and due to urban development within the City of Detroit Lakes. The increased sediment load carries nutrients, which contribute to the downstream increase in phosphorus levels in the Floyd Lakes and in lakes downstream of the Watershed. The excess sediment and nutrients also contribute to decreased dissolved oxygen levels and to degraded habitat conditions for fish and macroinvertebrates, as indicated by those respective impairments in the Pelican River. A Bank Assessment of Nonpoint Source Consequences of Sediment (BANCS) was used to determine the highest loading in the Campbell Creek Watershed (Appendix A, Clark, 2022).

Pastures and feedlots

Pastured animals with access to the streambanks contribute to sediment loading by decreasing vegetation and trampling and destabilizing the banks. Runoff from overgrazed pastures and manure deposition directly into the waterbodies also contribute *E. coli* bacteria, nutrients, and sediment to the streams and downstream lakes. The excess sediment, nutrients, and bacteria can also contribute to decreased dissolved oxygen levels and to degraded habitat for fish and macroinvertebrates.

Animal feedlots may also be a source of water quality and aquatic habitat degradation if they do not have adequate manure storage or if they discharge untreated and manure-contaminated runoff from the feedlots or manure storage areas to surface water or groundwater. According to the MPCA's most recent feedlot registration data (MPCA, 2022b), there are 20 animal feedlots located in the Headwaters of the Pelican River Watershed that currently have animals or livestock or have had animals at any one time. Of those, 12 are indicated as currently having animals or livestock, are not considered large, concentrated animal feeding operations (CAFOs), and do not require a National Pollutant Discharge Elimination System (NPDES) permit or a State Disposal System (SDS) permit for their daily operation. Of the 12 active feedlots, 8 are indicated as housing animals on open lots with or without runoff controls, 8

are indicated as animals also having access to pasture, 4 are indicated as having liquid manure storage areas and 7 are indicated as having solid manure storage areas with or without runoff controls, while 2 are indicated as being located within 1,000 feet but greater than 300 feet of a river or stream. Additionally, inactive feedlots that no longer have animals may still be a source of water quality and habitat degradation if they have feedlots or manure storage areas that were not properly cleaned out or "closed," resulting in manure or manure-contaminated runoff discharging into surface water or groundwater from those areas. Of the 8 inactive feedlots in the watershed, 4 indicate that they have had animals on open lots, with or without runoff controls, 2 indicate that animals also had access to pasture, and 3 are indicated as having solid manure storage areas with or without runoff controls, with 1 being located within 1,000 feet of a lake and 2 as being located within 1,000 feet but greater than 300 feet of a river or stream. While these inactive feedlots may not currently be housing animals, state rules and statutes do not preclude these properties from having animals or livestock again in the future.

The numbers of animals currently raised in active animal feedlots within the Headwaters of the Pelican River Watershed, according to the MPCA's most recent feedlot registration data, are summarized in Table 7 (MPCA, 2022b). These numbers may not include those animals raised exclusively on pasture within the watershed, as pastures are not required to be registered with the MPCA. These numbers also may not include those animals that may be currently housed at unregistered feedlots or other properties.

Table 7. Animal counts in registered feedlots in the Headwaters of the Pelican River Watershed by Subcatchment[1]

	Campbell Creek	Floyd Lake	Headwaters Pelican River/Ditch 13	Totals
Beef	273	98	620	991
Dairy	194	0	110	304
Donkey/Mule	0	0	1	1
Horse	6	0	6	12
Turkey	0	0	64,800	64800
Chickens	28	0	0	28
Ducks	15	0	0	15
Mink	0	0	15,000	15,000

[1]There are currently no active registered animal feedlots in the Little Floyd Lake and Sands Lakes subcatchments.

Cropland runoff

Row crop agriculture is a contributor to nutrient and sediment loading. If livestock manure is applied to the fields, it can also be a contributor to nutrient and bacteria loading. Generally, the pollutant loading comes from runoff following storm events from fields with steep slopes or that are heavily ditched or tilled, and without buffers or cover crops. Draining water rapidly from fields through ditches or tile drainage also changes the speed of the water entering the system and increases in-stream erosion. The rapid drainage to tiles or ditches also prevents the natural infiltration of nutrients and the settling of sediment. Losing nutrients and soil from the fields is costly to both the producer in the form of decreased crop yields and increased inputs and maintenance costs, and to the health of the watershed in the form of degraded water quality and habitat for fish, macroinvertebrates, and other wildlife.

Shoreline and urban development

Phosphorus, TSS, and *E. coli* are carried in stormwater from unprotected or unvegetated landscapes to the waterbodies. Increased shoreline and urban development, a move from seasonal to year-around shoreline residences, lake shore modifications, construction sites with exposed soils, and commercial and industrial areas with large impervious surfaces have led to increased loading and pressure on the system. Furthermore, culverts and stream crossings under roads can create bottleneck situations by backing up water flow, increase downstream erosion due to scouring, and impede fish passage by blocking their access. In the Headwaters of the Pelican River Watershed, Sands Lake remains mostly undeveloped, with a few seasonal dwellings, while the Floyd Lakes are largely developed. Additionally, the Pelican River enters and runs through the City of Detroit Lakes at the downstream end of the watershed, with approximately 5% of this part of the Pelican River's drainage area falling within Detroit Lakes' municipal stormwater boundaries (MPCA, 2021a). The MPCA has determined that the fish and macroinvertebrate communities in this portion of the Pelican River are "stressed," or impaired, due to flow regime instability, insufficient physical habitat, high suspended sediment, and low dissolved oxygen, partly due to shoreline alterations and to storm surge runoff from impervious surfaces (MPCA, 2021b).

Wetlands

Many of the wetlands within the Headwaters of the Pelican River Watershed have been drained, ditched, or otherwise altered in some way. Some wetlands, such as the Rice Lake Wetland along the Pelican River, are significant sources of phosphorus to downstream waters after being overloaded through alterations of the wetlands or excessive loading through stormwater. The loss or alteration of wetlands has also greatly contributed to flow regime instability in the watershed as less water is held on the landscape and within the wetlands, resulting in degraded water quality and stressed fish and macroinvertebrate communities downstream.

SSTS

Noncompliant or failing subsurface sewage treatment systems (SSTS) can contribute to nutrient and bacteria loading and to degraded water quality and fish and macroinvertebrate habitat. In some areas, there are properties that still use holding tanks rather than SSTS, which can overflow and leak when not properly maintained. The *Becker County Local Water Management Plan (2017-2026)* estimates that the countywide failure rate for SSTS could be over 50% (BSWCD, 2017, p. viii). The SSTS for the Headwaters of the Pelican River Watershed that are identified in this plan are enough to address the loading from the SSTS and provide necessary reductions.

Internal loading

Internal loading can be a significant source of phosphorus in lakes, especially in shallow lakes and if the lake has a long history of excessive phosphorus inputs. Lakebed sediments can be high phosphorus contributors in a lake as organic material and sediment fall out of the water column, settle on the bottom of the lake, and then mix back into the water column through chemical release during periods of low oxygen concentrations or through physical disturbances of the lakebed sediments from fish, waves, and human activity. Internal loading is identified as a focus in the *PRWD Comprehensive Watershed Management Plan* (PRWD, 2020a), especially for Mud (North Floyd) Lake.

Mercury

Mercury is a naturally occurring element that can be toxic to humans and animals at high concentrations. Mercury is emitted into the atmosphere most commonly from the burning of coal or the processing of minerals or materials such as taconite and is also still present in commonly used household items. Mercury emitted into the atmosphere moves with wind and weather and may deposit on land or in water. As a result, Floyd, Mud (North Floyd), and Little Floyd Lakes are all indicated as impaired due to excess mercury in fish tissue. However, mercury deposition is beyond the scope of this plan and practices addressing atmospheric deposition of mercury are not likely as part of this plan, except for the potential to support legislative initiatives which reduce mercury emissions.

Element b. estimated reductions

> *An estimate of the load reductions expected for the management measures described under paragraph (c) below (recognizing the natural variability and the difficulty in precisely predicting the performance of management measures over time). Estimates should be provided at the same level as in item (a) above (e.g., the total load reduction expected for dairy cattle feedlots; row crops; or eroded stream banks).*
>
> EPA *Handbook for Restoring and Protecting Our Waters*

The Headwaters of the Pelican River Watershed was split into five subcatchments (Figure 2) to allow specific tracking to meet the TMDLs and to reduce pollutant loading to the Floyd Lakes and to other sensitive lakes downstream. The activities and BMPs described in Table 6 will yield the following reductions. The EPA Pollutant Load Estimation Tool (PLET, EPA, 2022) was used to calculate loads and reductions associated with the practices in this watershed (Table 8).

Table 8. Total estimated nutrient and sediment reductions when plan fully executed (EPA, 2022).

Watershed	Nitrogen reduction (lbs/yr)	Phosphorus reduction (lbs/yr)	Sediment reduction (t/yr)
Campbell Creek	7296.96	1650.01	539.87
Floyd Lake	3937.01	851.39	293.48
Headwaters Pelican River/Ditch 13	12068.5	2739.2	344.78
Little Floyd Lake	67.47	20.53	13.81
Sands Lake	61.81	16.4	9.46
Total	**23431.75**	**5277.53**	**1201.4**

When fully executed, the activities in this plan will achieve water quality standards for the Headwaters of the Pelican River Watershed sediment and *E. coli* TMDLs and achieve the phosphorus protection goals for Sands, Floyd, and Little Floyd Lakes.

Campbell Creek - TSS

The PLET load and load reduction estimates for the Campbell Creek Subcatchment are summarized in Table 9. These reductions exceed the reductions needed to meet the Campbell Creek TSS TMDL.

Table 9. Loads and reductions for Campbell Creek Subcatchment (EPA, 2022).

Watershed	Nitrogen load (lbs/yr)	Phosphorus load (lbs/yr)	Sediment load (t/yr)	Nitrogen reduction (lbs/yr)	Phosphorus reduction (lbs/yr)	Sediment reduction (t/yr)
Campbell Creek	13669.03	2561.63	701.57	7296.96	1650.01	539.87

The practices in this plan will also reduce the sediment and nutrient loading to the Floyd Lakes and to the Pelican River, helping to reduce the downstream trends of rising phosphorus, low dissolved oxygen,

and degraded aquatic habitat, and helping protect the Floyd Lakes and other sensitive lakes downstream from becoming nutrient impaired.

Pelican River – *E. coli*

The sources of *E. coli* are addressed primarily through the implementation of livestock, feedlot, pasture, cropland, and manure management activities, urban stormwater management, and addressing failing/nonconforming SSTS. There are approximately 1,345 SSTS in the watershed (BCPZ, 2022) with an assumed failure rate of 50% (Becker SWCD, 2017).

Table 10. SSTS by catchment in the Headwaters of the Pelican River Watershed (BCPZ, 2022).

Watershed	# SSTS	# estimated failing SSTS
Campbell Creek	76	38
Floyd Lake	624	312
Headwaters Pelican River/Ditch 13	548	274
Little Floyd Lake	86	43
Sands Lake	11	6
Total	**1345**	**673**

It is estimated that approximately 673 SSTS need upgrades/replacement and will yield nutrient reductions (Table 11) and reduce *E. coli* loading to the Pelican River.

Table 11. Summary of nutrient reductions from SSTS upgrades/replacement (EPA, 2022).

Nitrogen reduction (lbs/yr)	P reduction (lbs/yr)	Sediment reduction (t/yr)
693.27	271.53	0

As discussed above, the other anthropogenic sources of *E. coli* in the Headwaters of the Pelican River Watershed come from animal operations, particularly feedlot and pasture runoff and livestock (cattle) access to streams, and from urban stormwater. The SSTS upgrades/replacements, feedlot and pasture fixes, urban stormwater management strategies, and other practices described in Table 6 that target critical loading areas within the Headwaters of the Pelican River Watershed will address the needed bacteria reductions to meet the Pelican River *E. coli* TMDL and will also contribute to water quality and aquatic habitat improvements.

Nutrients

There are no nutrient-impaired lakes requiring TMDLs in the Headwaters of the Pelican River Watershed. Watershed lakes, especially Floyd, Mud (North Floyd), Little Floyd, and Sands Lakes have increased pressure from land use changes, development, agriculture, and loading from Campbell Creek. The MDNR, MPCA, and BWSR Lakes Phosphorus Sensitivity Significance Study (2022) concluded that a 5% reduction of phosphorus in their watersheds would provide protection to these lakes (Table 12). Mud (North Floyd) Lake is included withing the Floyd Lake Watershed and is currently included in the PRWD's protection goal for Floyd Lake.

Table 12. Loading and estimated load reductions recommended by MDNR, using the PLET model (EPA, 2022).

Watershed	Phosphorus load (lbs/yr)	Phosphorus load goal (lbs/yr)	Reduction goal (lbs/yr)	Reduction
Floyd Lake	2248.9	2136.5	112.4	5%
Little Floyd Lake	30.0	28.5	1.5	5%
Sands Lake	62.2	59.1	3.1	5%

The protection goals and reductions for these lakes have been met and exceeded as summarized in Table 5 and Table 8. The protection goals and reductions for Little Floyd Lake will receive contributions from nutrient and sediment reductions in the upstream Campbell Creek, Sands Lake, and Floyd Lake watersheds. Furthermore, the nutrient reduction practices in this plan will also help reduce sediment and bacteria loading in the watershed and will contribute to water quality and aquatic habitat improvements.

Element c. best management practices

A description of the BMPs (NPS management measures) that are expected to be implemented to achieve the load reductions estimated under paragraph (b) above (as well as to achieve other watershed goals identified in this watershed-based plan), and an identification (using a map or a description) of the critical areas (by pollutant or sector) in which those measures will be needed to implement this plan.

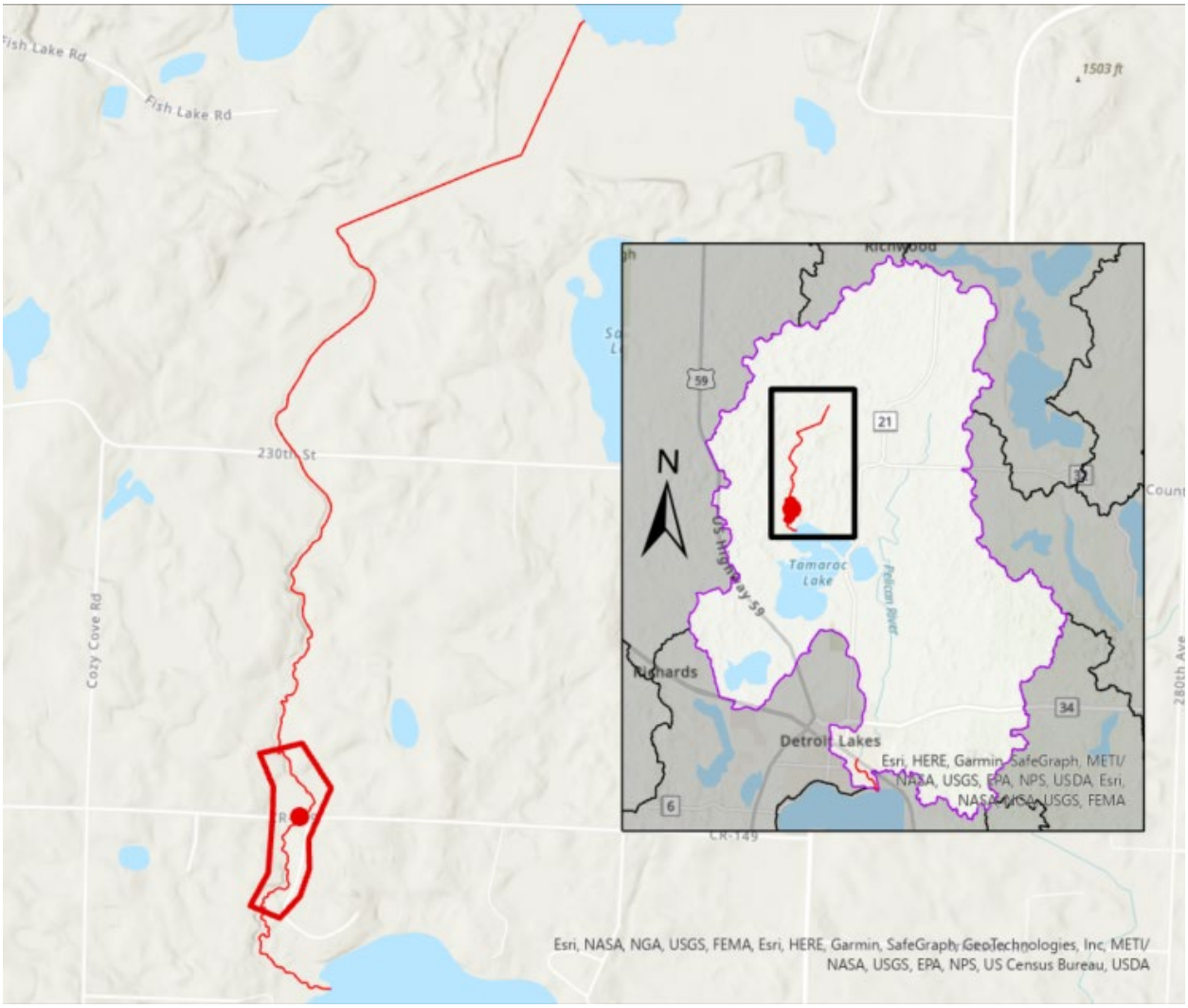
EPA *Handbook for Restoring and Protecting Our Waters*

Planned implementation for the Headwaters of the Pelican River Watershed is described fully in Table 6.

Streambank restoration

Streambank erosion and instability has been identified as a significant contributor of sediment loading directly within Campbell Creek, and to the Pelican River, due to increased stream flows from ditching and straightening of the stream channel and from increased tile drainage, and from decreased water storage on the landscape. Therefore, this plan identifies streambank stabilization as a significant priority especially for Campbell Creek. BMP efforts to stabilize the streambanks of Campbell Creek may include rock riffle grade control structures, toe-wood and/or root wad installations, establishment of well-rooted riparian vegetation, re-establishing natural floodplains, and other streambank stabilization practices. Additionally, the existing road culvert underneath County Road 149 has been identified for potential replacement or enhancement to allow for the channel bed to be raised to a stable condition, and/or to allow for streambank stabilization without steep slopes if done without culvert replacement. The streambank stabilization practices identified in this plan will focus on the critical area identified along the lower end of Campbell Creek just upstream of Mud (North Floyd) Lake, from roughly 1,400 feet upstream to roughly 2,400 feet downstream of Becker County Road 149 (Figure 7). These practices will be planned, designed, and implemented in partnership between the PRWD, MDNR, and other local partners. Streambank stabilization practices for both Campbell Creek and the Pelican River will contribute to the sediment, nutrient, and bacteria reductions identified above, and will also improve dissolved oxygen and aquatic habitat conditions downstream.

Figure 7. Lower Campbell Creek critical streambank restoration area, including County Road 149 culvert (MPCA, 2023).



Pasture and feedlot practices

According to the EPA PLET (EPA, 2022), pastures with livestock directly accessing the streambanks and animal feedlots are significant contributors of sediment and nutrients, as well as *E. coli* bacteria, within the Headwaters Pelican River Watershed. Pasture practices identified in this plan will focus on prescribed grazing in the Campbell Creek, Floyd Lake, and Headwaters Pelican River/Ditch 13 subcatchments, and may also include practices to restrict livestock access to streambanks and surface waters such as exclusion fencing, heavy use protection, access control, and watering facilities. Animal feedlot practices identified in this plan will focus on installing at least one waste management system in each of the Campbell Creek, Floyd Lake, and Headwaters Pelican River/Ditch 13 subcatchments, such as a manure storage structure or feedlot runoff controls and may also include properly cleaning out or "closing" an inactive or unused feedlot or manure storage area. Pasture and feedlot practices will especially result in nutrient and bacteria reductions and will also contribute to sediment reductions, increased dissolved oxygen, and improved aquatic habitat.

Agricultural and cropland practices

Overland erosion from wind and water has been identified as a significant contributor of sediment and nutrient loading, as well as *E. coli* bacteria loading, within the Headwaters of the Pelican River Watershed. Potential BMPs identified in this plan to address overland erosion include water and sediment control basins, grade stabilizations, wetland restorations, drainage water management, buffer and filter strips, cover crops, no-till practices, nutrient and manure management, and more. Practices and targets identified in Table 6 are intended to focus on critical areas within each of the five subcatchments and will result in sediment, nutrient, and bacteria reductions and improvements in dissolved oxygen and aquatic habitat conditions. The PRWD has also identified a goal of maintaining a cost share program to help farmers install agricultural volume reduction BMPs to reduce runoff, improve surface and ground water quality, and provide pollinator and wildlife habitat.

The PRWD has previously partnered with federal, state, and local partners to prioritize and install over 25 agricultural BMPs in the Upper Campbell Creek subcatchment, including terrace and tile drainage structures, stream bank buffers, and wetland restorations, resulting in noted reductions in overland erosion in those locations. Table 13 includes the estimated reductions for recorded agricultural BMP practices in the Headwaters of the Pelican River Watershed that were funded by NRCS or Minnesota's Clean Water Funds. This list is not all inclusive, and additional practices are needed within the entire Headwaters of the Pelican River Watershed.

Table 13. Agricultural BMP activities in the Headwaters of the Pelican River Watershed from 2011-2021 (PLET, 2023 and MPCA, 2023)

Practice Description	Installed amount	Units	Estimated reductions		
			TN lbs/yr	TP lb/yr	TSS t/yr
Streambank and Shoreline Protection	622	feet	0.49	0.18	0.02
Grade Stabilization Structure	1	count	6	1.58	0.7
Nutrient Management	2,959	acres	4.29	1.98	0
Cover Crop	39	acres	16.16	3.04	1.36
Water & Sediment Control Basins	14	count	234.26	61.81	27.2
Subsurface Drain	2,933	feet	1.76	0.46	0.2
Critical Area Planting	2	acres	4.15	0.5	0.15
Conservation Cover	13	acres	5.87	0.42	0.09
Tree/Shrub Establishment	32	acres	32.34	2.75	0.59
Prescribed Grazing	66	acres	59.12	3.37	0.77
Filter Strip	0	acres	16.04	4.34	1.86
Storm Water Retention Basins	2	count	3.95	0.76	0.11
Wetland Enhancement	3	acres	5.62	1.19	0.5
Wetland Restoration	3	acres	5.62	1.19	0.5
Fence	5,673	feet	4.44	0.63	0.2
Forage and Biomass Planting	35	acres	13.33	0.83	0
Heavy Use Area Protection	1,600	Sq ft	3.38	0.36	0.09
Livestock Pipeline	1,172	feet	0.58	0.09	0.03
Underground Outlet	711	feet	0.04	0.01	0.03
Watering Facility	4	count	0.06	0.01	0

Shoreline and urban development practices

Practices to address pollutant loading from shoreline and urban development will focus on reducing impervious surfaces and unprotected or unvegetated landscapes, retention or infiltration of stormwater, education and outreach for property owners and municipalities, and refining and enforcing stormwater-related regulations. The PRWD focuses on stormwater as part of its regular work and works to identify areas needing additional stormwater BMPs, especially in critical areas around the Floyd Lakes and along the Pelican River within the City of Detroit Lakes. The PRWD has also identified a goal of maintaining a cost share program to help landowners implement voluntary stormwater BMPs such as raingardens and for converting shoreline turf grass, rip rap, and/or sea walls into lake- or stream-friendly vegetated buffers, all of which reduce runoff, improve water quality, and provide pollinator and wildlife habitat.

Wetland restorations and regulation

The PRWD has identified restoring the Rice Lake Wetland area as a significant project for reducing pollutant loading and improving habitat conditions in the Pelican River and sensitive lakes downstream. Wetland restorations have also been identified for cropland BMPs in each of the five subcatchments to help aid in nutrient, sediment, and bacteria loading and improved habitat conditions. In addition to restoring wetlands, the PRWD has also identified other wetland goals and actions, including an inventory of existing wetlands, identifying new opportunities for wetland protection and restoration, and enforcing applicable wetland regulations.

SSTS upgrades and replacements

Noncompliant or failing subsurface sewage treatment systems (SSTS) can contribute to nutrient and bacteria loading and result in degraded water quality and aquatic habitat, with the countywide SSTS failure rate estimated as high as or even over 50% (BSWCD 2017). The estimated number of noncompliant or failing SSTS by subcatchment within the Headwaters of the Pelican River Watershed is provided in Table 10, with an estimated 673 individual SSTS needing upgrades or replacement. Critical areas will be those SSTS identified as an Imminent Threat to Public Health and Safety (i.e., a straight pipe discharge of untreated sewage) and those known noncompliant or failing SSTS near streams and lakeshores based on county records or inspections. As identified in Table 6, the PRWD will explore cost share or low interest loan opportunities for property owners looking to upgrade or replace their noncompliant or failing SSTS, as well as assist in providing information and education regarding septic system maintenance and other sources of financial and technical assistance through flyers and social media or at local events, among other efforts. While the PRWD and Becker SWCD will assist in these educational and assistance efforts, the Becker County Planning and Zoning Department is responsible for enforcing SSTS rules and ordinances in Becker County.

Internal loading practices

Internal loading of phosphorus is identified as a potentially significant contributor for Mud (North Floyd) Lake. The PRWD has identified a potential assessment or study of internal loading within Mud (North Floyd) Lake and may consider an in-lake treatment (such as an alum application) to mitigate the effects of internal loading after excess loading from the Campbell Creek and Floyd Lake subcatchments are fully addressed.

Education and outreach practices

As indicated in Table 6, the PRWD has identified several education and outreach activities to help achieve reduction and protection goals within the Headwaters of the Pelican River Watershed, including those regarding shoreline alterations, SSTS, private wells, agricultural water use, urban stormwater, and more. Additionally, the PRWD will continue to pursue and provide information to landowners regarding other funding opportunities, including but not limited to other state funding via BWSR, MDNR, MPCA, MDH, MDA, and others, federal funding via USDA, USGS, EPA, and others, and local funding via special interest groups and other organizations.

Element d. expected costs and technical assistance

An estimate of the amounts of technical and financial assistance needed, associated costs, and/or the sources and authorities that will be relied upon, to implement the entire plan (include administrative, Information and Education, and monitoring costs). Expected sources of funding, States to be used Section 319, State Revolving Funds, USDA's Environmental Quality Incentives Program and Conservation Reserve Program, and other relevant Federal, State, local and private funds to assist in implementing this plan.

The cost to implement this plan fully is estimated at approximately$31.2 million. Costs by practices and activities are itemized in Table 6. This estimate includes implementation of BMPs, staff time, education and outreach, studies, inventories, and monitoring. The implementation of this plan will be funded by local funding, state and federal grants, and support from private organizations. Section 319 grant funding will serve as the foundation for implementing this plan. Additional funding includes watershed district levies, local SWCD operational funding, State Clean Water Funds and Watershed Based Implementation Funds through BWSR, and USDA NRCS EQIP funding. Landowners will contribute funds for grant match requirements. Private organization and foundation funding opportunities will also be pursued.

A comprehensive discussion of partnerships can be found in Section 5 and Appendix B of the *PRWD Comprehensive Watershed Management Plan* (PRWD, 2020a). Furthermore, the PRWD is part of the Otter Tail Watershed Partnership and has been fully involved in the development of the OTCWMP, with participation in that partnership's Policy Committee, Steering Committee, Technical Advisory Committee, and Citizen Advisory Committee. The OTCWMP was finalized in December 2022 and approved in January 2023, with implementation of the plan beginning in spring of 2023 utilizing approximately$632,500 per year in noncompetitive Watershed Based Implementation Funding administered through BWSR. The Headwaters of the Pelican River Watershed is included as a focus area in the OTCWMP, initial work plans and budgets are being drafted, and funding and resources for this plan will be pursued through the OTCWMP.

In addition to the partnerships mentioned above, additional partners have contributed to the development of this plan and will continue to be relied upon through plan implementation, including MDNR geomorphology, streambank stability, and fisheries experts, other Becker County departments such as the highway engineer, local, county, state, and federal emergency managers, local, county, state, and federal floodplain managers, and others.

PRWD advisory committees

The District has a Citizen Advisory Committee (CAC) and a Technical Advisory Committee (TAC). Functioning like a planning commission does for a city council, these committees meet on an annual and ad hoc basis to identify water resource issues, generate new ideas and approaches, provide input on programs and projects, review and comment on the annual work plan, identify collaborative funding opportunities, and generally provide recommendations to the Board of Managers. The CAC is currently composed of citizens representing several of the District's Lake Water Quality Management Areas as well as a Becker County Commissioner and a local landscaper but could also include representatives from special interest groups (e.g., conservation, agriculture), lake associations, and more. The TAC is currently composed of representatives from BWSR, MDNR, MPCA, MnDOT, the Becker County Highway

Department and the Becker County SWCD but could include representatives from other local and state agencies. Together, the CAC and TAC help strengthen the District's connections with the public and other agencies, respectively (PRWD, 2020a).

Element e. education and outreach

An information/education component that will be implemented to enhance public understanding of the project and encourage their early and continued participation in selecting, designing, implementing, and maintaining the NPS management measures that will be implemented.

There are several strategies to provide education and outreach for this project as highlighted in Table 6. This is a critical tool for successful implementation for BMPs. Providing landowners with the information they need to make wise management decisions for their property is key to restoring the quality of these waters.

The education and outreach for this plan are further detailed in the *PRWD Comprehensive Watershed Management Plan* (PRWD, 2020a) and in Appendix D of the OTCWMP (PRWD, 2023a). A summary of those activities includes

- Producing publications for the general public (reports, brochures, news articles);
- Maintaining and updating social media pages;
- Maintaining and updating the PRWD website;
- Media interaction, including monthly local radio shows;
- Hosting technical trainings for contractors and landscapers;
- Leading workshops on AIS;
- Organizing river clean up events;
- Working with schools;
- Disseminating and creating BMP information, including SSTS information, for realtors, landowners, and developers; and
- Providing assistance to organizations and community members.

Educational events may include a data collection component. The District is involved with several educational events every year with students from the local school districts. These students learn general water quality and natural resources concepts, as well as the basics of evaluating water quality and biotic communities in a stream (PRWD, 2023b). Monitoring workshops will be conducted from time-to-time with Becker County Coalition of Lake Associations and other local stakeholder groups to improve involvement in Citizen Monitoring (PRWD, 2020a).

Element f. reasonably expeditious schedule

A schedule for implementing the activities and NPS management measures identified in this plan that is reasonably expeditious.

The schedule for this watershed plan is divided into 2-year milestone increments described in Table 6. When implemented as planned, the activities and BMPs described will reach the estimated reductions needed to meet water quality standards in 10 years.

Element g. milestones

A description of interim, measurable milestones for determining whether NPS management measures or other control actions are being implemented.

The planned milestones for this watershed are divided in 2-year increments and will take place over the next 10 years (2023-2032). Specific milestones for each activity are captured in Table 6. The accomplishment of these milestones will be used to evaluate the implementation of this plan.

Element h. assessment criteria

A set of criteria that can be used to determine whether loading reductions are being achieved over time and substantial progress is being made toward attaining water quality standards.

The assessment criteria for this watershed are the unit of measure is described in Table 6. The assessment criteria and achievement of milestone goals will be used to measure the accomplishment of this NKE plan.

Element i. monitoring

The monitoring & evaluation component to track progress and evaluate the effectiveness of the implementation efforts over time, measured against the criteria established under item (h) immediately above.

Specific tasks, schedules, milestones, costs, and assessment criteria for the monitoring plan are included in Table 6. The PRWD's monitoring plan is discussed in section 5.2.3 of the *PRWD Comprehensive Watershed Management Plan* (PRWD, 2020a), and watershed-wide monitoring plans are discussed in Section 8 ("Know it") of the OTCWMP (PRWD, 2023a). The PRWD also developed the *10-Year Water Quality Monitoring Plan* (PRWD, 2020b) in 2020 for lake and stream monitoring in the Pelican River Watershed. The 10-year plan, as it relates to this NKE, is summarized below.

The specific methodology for sampling is described in both the *10-year Water Quality Monitoring Plan* and in the PRWD's annual monitoring and data collection work plans (PRWD, 2023c). These plans and the associated annual monitoring reports outline the data collection activities and special studies that are performed by the District each year.

Highlights of monitoring plans and additional tasks included in Table 6 are listed below.

- BMP effectiveness: a minimum of two BMPs will be monitored per year with visual assessments and three chemical samples for TSS and phosphorus concentrations.
- Existing monitoring plans will be updated to include an assessment of chemical water quality parameters and flow.
- Annual visual assessments of bank and bluff erosion/run off, both routine and following anomalous events.
- Annual monitoring of select PRWD streams and lakes.
- Annual drainage system inspections in PRWD ditches 11/12 (Campbell Creek) and 13 (Pelican River).
- Annual inspections of boat access points for invasive species.
- MPCA's Intensive Watershed Monitoring of the Otter Tail River Watershed in 2027 and 2028 (PRWD, 2023a).
- Analyze monitoring data and adapt this plan as needed based on the results of MPCA's watershed assessments of available water quality data from 2019 through 2028, to be completed in approximately Spring 2029.

Stream monitoring

Select streams in the Headwaters of the Pelican River Watershed will be monitored each year for water quality on a weekly, bi-weekly, and/or event related basis. There are 11 stream sites on Campbell Creek and the Pelican River which are summarized in Table 14. Routine sampling of these streams will record stream stage (water level), stream discharge (flow), Total Phosphorous (TP), Orthophosphate (OP), Total Suspended Solids (TSS), Dissolved Oxygen (DO), pH, Specific Conductance (SC), *E. coli*, transparency, chlorides, and water temperature. In addition to these metrics, other conditions are recorded such as rainfall, beaver dams, tree snags, and instream vegetation (PRWD, 2020b).

The District collects data during anomaly events to capture extremes. Anomalous examples may include rainfall events greater than 1-inch in a 24-hour period, erosion, blockages, or other anomalies reported by stakeholders or other professional organizations (PRWD, 2020b).

Table 14. Stream monitoring sites in the Headwaters of the Pelican River Watershed NKE plan (adapted from PRWD, 2020b).[1]

		Weekly Visit		Biweekly		Event/Storm	
Site	**Description**	**Staff Gauge**	**HOBO**	**Chemical**	***E.Coli***	**Chemical**	***E.Coli***
CC2	Campbell Creek at 230th St	X	X	B		X	
CC2a	Campbell Creek 1/4mi Downstream of 230th St	X		A			
CC1	Campbell Creek at CR-149	X	X	B		X	
CC1a	Campbell Creek Outlet to North Floyd Lake	X		A			
PR1	Little Floyd Outlet on Little Floyd Rd	X		A			
PR2	Pelican River at Anchor Rd	X		B		X	
PR2a	Pelican River at Rice Lake Outlet	X	X	B			
PR3	Pelican River at State Highway 34	X	X	A	X	X	
IP	Outlet to Industrial Park Storm Sewer	X			X	X	X
PR4a	Pelican River at Corbett Rd*	X	X	A	X	X	X
PR4b	Pelican River at Lori Ave. (Weekly Flow Rating)	X					

[1]An "X" indicates sampling of given metric. Markers "A" and "B" indicate sampling during the first or second week of the biweekly schedule respectively.

*Monthly chloride samples taken

The monitoring sites along the impaired reach of Campbell Creek are illustrated in Figure 8 and the monitoring sites along the Pelican River to its outlet to Detroit Lake are illustrated in Figure 9.

Figure 8. Stream monitoring sites on Campbell Creek (PRWD, 2020b).

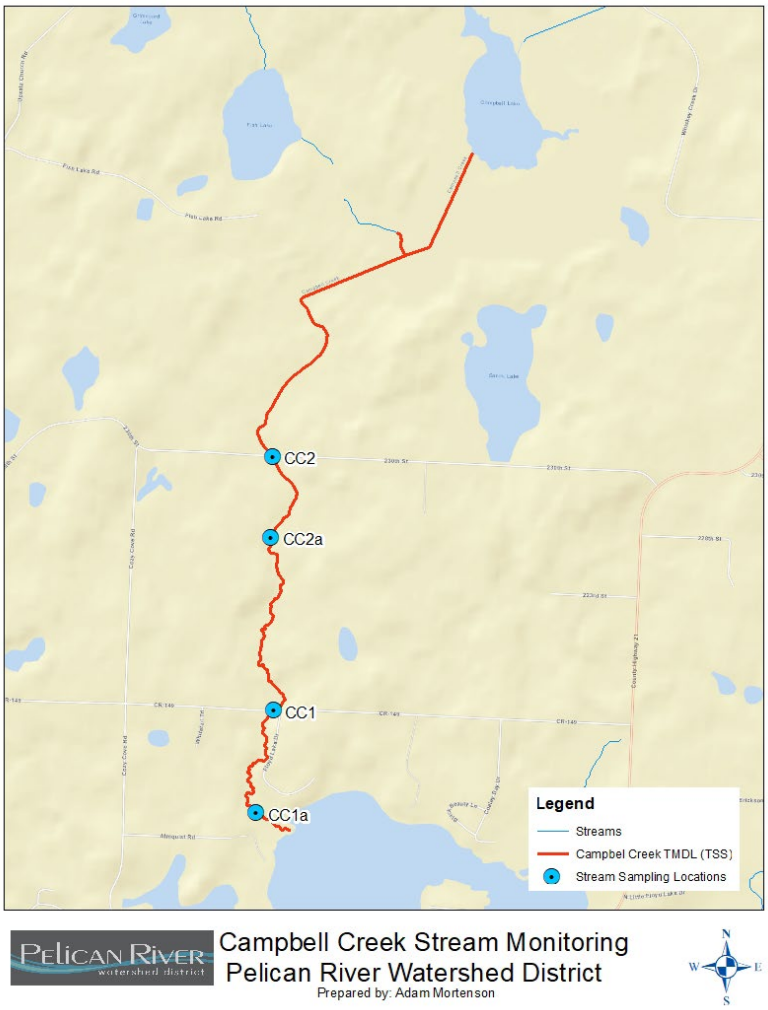
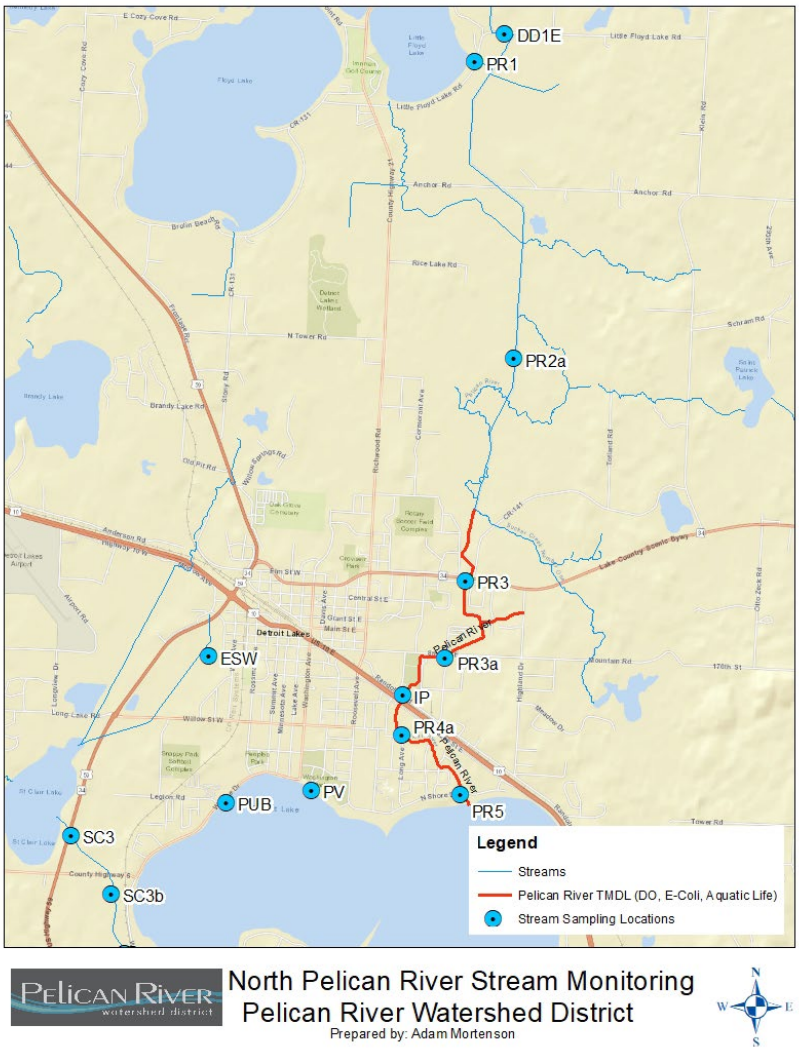


Figure 9. Pelican River stream monitoring sites (PRWD, 2020b).



Special projects may require collection of additional metrics and data outside of the routine sampling schedule. This would include effectiveness monitoring for projects implemented by the District. Examples of special sampling projects include stream cross-section surveys, stream reconnaissance surveys, and others as opportunity arises. Standard operating procedures for these projects will be developed on a per project basis. The District will use its partnerships to ensure proper sampling using unfamiliar techniques (PRWD, 2020b). Specific monitoring activities and milestones are included in Table 6.

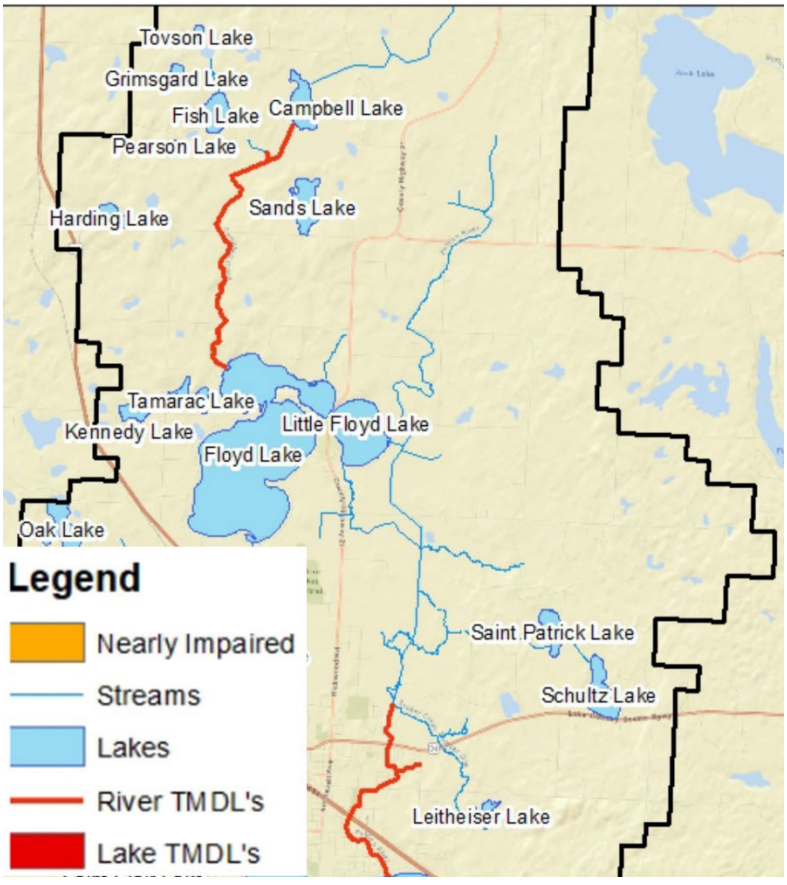
Lake monitoring

The purpose of the PRWD's lake monitoring program is to record changes in water quality and nearshore conditions, as well as the District's progress of implementing the NKE plan and other activities to enhance and restore water quality. Water quality parameters include TP, OP, chlorophyll *a* (chl-*a*), temperature, DO, pH, SC, Secchi depth, shoreline development, aquatic vegetation composition, and phytoplankton and zooplankton community composition (PRWD, 2020b). The District's lake monitoring schedule is shown in Table 15and the monitored lakes are sown in Figure 10.

Table 15. Long term lake water quality monitoring plan (adapted from PRWD, 2020b).

Lake Name	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
(Big) Floyd Lake	X	X	X	X	X	X	X	X	X	X
Mud (North Floyd) Lake	X	X	X	X	X	X	X	X	X	X
Little Floyd Lake	X	X	X	X	X	X	X	X	X	X
Oak Lake			X					X		
Campbell Lake				X					X	
Brandy Lake					X					X
Fish Lake					X					X
Kennedy Lake						X				X
Saint Patrick Lake					X					X
Sands Lake					X					X
Schultz Lake	X					X				
Tamarack Lake	X					X				

Figure 10. Lakes in the Headwaters Pelican River Watershed (PRWD, 2020b).



The District conducts shoreline surveys on select lakes to capture the rate of conversion from natural shoreline to a more heavily modified or developed shoreline. If opportunity allows, the District will

perform surveys on additional, minimally developed lakes to establish a baseline pre-development (PRWD, 2020b). Shoreline monitoring occurs every five years and is summarized in Table 16.

Table 16. Lake shoreline monitoring (adapted from PRWD, 2020b).

Lake Name	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Sands Lake			X					X		
Big Floyd Lake				X					X	
Little Floyd Lake				X					X	
Mud (North Floyd) Lake				X					X	

The PRWD also completes aquatic vegetation surveys on select lakes every five years, including on Big Floyd, Little Floyd, and Mud (North Floyd) Lakes. The next survey will be in 2025, and these surveys track the ecological integrity of the lake since diverse plant communities are important for healthy lakes (PRWD, 2020b).

Adaptive management

Adaptive management is an approach to water quality restoration efforts where BMP implementation efforts are combined with an on-going evaluation of the water quality issues. The monitoring described in this section and in Table 6 are developed to measure the progress toward water quality goals in the Headwaters of the Pelican River Watershed. Progress towards the goals of the PRWD will be measured in multiple ways including water quality indicators, momentum of social changes, numbers of BMPs adopted, and other quantitative or qualitative measures.

Ideally, the waterbodies would respond quickly to the adoption of BMPs. Over time, the land uses change, complex environments respond differently from expectations, legacy pollutants linger, economic needs conflict, and social change can be slow. Streambank restoration, pasture management, water storage BMPs, and riparian vegetation will cut sediment and bacterial loading to the stream. A stream is quicker to respond than a lake; however, a water chemistry response will not be the first indicator that the plan is working.

Lake responses to nutrient reductions will likely take longer. Responses in water quality data are often slow to materialize. Therefore, it is important to measure or quantify other outcomes. Outcomes include momentum of social change, numbers of BMPs implemented, quality and frequency of engagement, and visual assessments. Qualitative responses such as reductions of visual algal blooms or reducing or eliminating gully erosion are also other ways of seeing progress.

Water chemistry and visual assessments of the streams will provide the information to trigger adaptive management. The response of the water quality sampling will indicate whether this plan is working. As part of the grant project final reports that will occur every four years of implementation, the activities will be reviewed, collected data will be analyzed, and decisions made about how to progress forward. Semi-annual project reporting will allow partners to assess project success and make refinements over the course of the project implementation.

Effects of implemented BMPs are reflected by adjustments to the resource goals, implementation plan, and/or implementation efforts when needed. Adjustments are made to incorporate the knowledge gained through the combined efforts. Adaptive management—sometimes referred to as adaptive implementation—is critical when various uncertainties are significant in a watershed (Shabman et al., 2007). This approach is essentially a “learning while doing” approach. It means that uncertainty is not

forgotten once implementation begins. Rather, a focus is placed on reducing the uncertainty present through implementation, monitoring and evaluation, research, and experimentation. The knowledge gained through these efforts is then focused on reducing the uncertainties in the TMDL, the implementation approaches and/or water uses and criteria. The approach goes beyond just asking "when" in implementation to include "where, what, how and why" (Shabman et al., 2007).

Uncertainties related to the water quality criteria, TMDL numbers, sediment sources and aquatic life stressors are present in the Otter Tail River Watershed *E. coli*, Sediment, and Phosphorus TMDLs even though much was learned through the TMDL study. Through an adaptive management approach, this initial implementation plan has been developed to begin implementation activities, continue survey, and inventory efforts and evaluate the progress toward meeting the aquatic life goals for the river. As this work is completed, the TMDL implementation goals, priorities and BMPs will be examined and revised, as needed.

References

Becker Soil and Water Conservation District (BSWCD). (2017). *Becker County Local Water Management Plan January 1, 2017 – December 31, 2026.* http://co.becker.mn.us/dept/soil_water/PDFs/2017%20Becker%20County%20Local%20Water%20Management%20Plan.pdf.

Clark, Lorilynn, Minnesota Department of Natural Resources (MDNR). (2022). Personal communication, March 14, 2022.

Gubrud, Denise, Becker County Planning & Zoning (BCPZ). (2022). Personal communication, December 27, 2022.

Minnesota Department of Natural Resources (MDNR) and Minnesota Pollution Control Agency (MPCA). (2020). *Otter Tail River Watershed Stressor Identification Report – Lakes.* https://www.pca.state.mn.us/sites/default/files/wq-ws5-09020103b.pdf.

Minnesota Pollution Control Agency (MPCA), Minnesota Department of Natural Resources (MDNR), & Minnesota Board of Water and Soil Resources (BWSR). (2022). *Lakes of Phosphorus Sensitivity Significance (LPSS).* https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_dnr/env_lakes_phosphorus_sensitivity/metadata/Lakes%20of%20Phosphorus%20Sensitivity%20Significance%202022.pdf

Minnesota Pollution Control Agency (MPCA). (2021a). *Otter Tail River Watershed Total Maximum Daily Load Report.* https://www.pca.state.mn.us/sites/default/files/wq-iw5-21e.pdf.

Minnesota Pollution Control Agency (MPCA). (2021b). *Otter Tail River Watershed Restoration and Protection Strategy (WRAPS) Report.* https://www.pca.state.mn.us/sites/default/files/wq-ws4-82a.pdf.

Minnesota Pollution Control Agency (MPCA). (2022a). *Minnesota Statewide Mercury TMDL.* https://www.pca.state.mn.us/business-with-us/statewide-mercury-tmdl. Accessed December 9, 2022.

Minnesota Pollution Control Agency (MPCA). (2022b). *Feedlots in Minnesota.* https://gisdata.mn.gov/dataset/env-feedlots. Accessed December 12, 2022.

Minnesota Pollution Control Agency (MPCA). (2023). *Healthier Watersheds: Tracking the Actions Taken – Best Management Practices Implemented by Watershed.* https://www.pca.state.mn.us/business-with-us/healthier-watersheds-tracking-the-actions-taken. Accessed May 24, 2023.

Pelican River Watershed District (PRWD). (2020a). *Pelican River Watershed District Comprehensive Watershed Management Plan, Adopted March 25, 2020.* https://prwd.org/wp-content/uploads/2023/01/PRWD-Comprehensive-Watershed-Management-Plan_-adopted-March-252020.pdf

Pelican River Watershed District (PRWD). (2020b). *10-Year Water Quality Monitoring Plan, Adopted March 19, 2020.* https://prwd.org/wp-content/uploads/2021/02/10-Year-Plan_updated-6_23_21.pdf.

Pelican River Watershed District (PRWD). (2023a). *Otter Tail Comprehensive Watershed Management Plan (OTCWMP), Adopted January 25, 2023.* https://prwd.org/resources/water-management-plan/.

Pelican River Watershed District (PRWD). (2023b). *Our Work: Education.* https://prwd.org/project/education/. Accessed June 23, 2023.

Pelican River Watershed District (PRWD). (2023c). *Data Collection.* https://prwd.org/resources-category/data-collection/. Accessed June 23, 2023.

Shabman, L., K. Reckhow, M.B. Beck, J. Benaman, S. Chapra, P. Freedman, M. Nellor, J. Rudek, D. Schwer, T. Stiles and C. Stow. (2007). *Adaptive Implementation of Water Quality Implementation Plans: Opportunities and Challenges*. Nicholas School of the Environment and Earth Sciences, Nicholas Institute, Duke University.

United States Environmental Protection Agency (EPA). (2022). *Pollutant Load Estimation Tool (PLET).* https://www.epa.gov/nps/plet.

Appendix A

Summary of Bank Assessment of Nonpoint Source Consequences of Sediment (BANCS) used to determine the highest loading in the Campbell Creek Watershed (Clark, 2022).

		Colorado curve		North Carolina curve		Yellowstone curve	
	Total length (ft)	**per foot tons/yr/ft**	**total tons/yr**	**per foot tons/yr/ft**	**total tons/yr**	**per foot tons/yr/ft**	**total tons/yr**
Estimated erosion current condition (2018 data)							
Upstream of 149	864	0.0534	46.12	0.017	14.73	0.0678	58.58
Downstream of 149	2249.14	0.0519	116.73	0.0217	48.76	0.0749	168.50
Estimated erosion POST project							
Upstream of 149	864	0.009	7.79	0.0008	0.72	0.0109	9.43
Downstream of 149	2249.14	0.0103	23.26	0.0009	2.06	0.0123	27.72