

**Project Name** | 3-006-F: Watershed Management Plan Update**Date** | 3-19-2020**To / Contact info** | CLFLWD Board of Managers**Cc / Contact info** | Mike Kinney, District Administrator**From / Contact info** | Meghan Funke, PhD PE; Greg Graske, PE**Regarding** | Lake District Budgeting Table Update (2020-2024)

During the December 19, 2019 regular meeting, the Board directed EOR to prepare a 5-year outlook for potential projects in each lake management district, similar to what was done a couple years ago, to be presented at the last board meeting in March. Attached is an updated version of the Lake District Budgeting table that EOR prepared in support of the 2020 budgeting process. This table has been updated based on new information gathered as part of the District's diagnostic monitoring and adaptive management approach since the 2020 budgeting process. The information presented in this table is intended to provide general information on the type and scale of projects needed to achieve the existing lake load reduction goals. Phosphorus reduction estimates are provided for completed and in-progress projects, and for future projects only where sufficient feasibility work has been completed to determine this calculation.

The Lake District Budgeting table will serve as the starting point for developing the full 10-year Capital Improvement Plan in the 2022-2031 Watershed Management Plan. Additional input regarding issues, goals and implementation activities gathered as part of the planning process will also be needed to complete the 10-year Capital Improvement Plan. EOR is open to further direction from the Board regarding the Lake District Budgeting table, but recommends that the Board consider including more detailed discussions regarding the table as part of the Watershed Management Plan Update workshops that will be scheduled with the Board and Technical Advisory Committee.

Projects	Estimated Annual P Reductions	Phosphorus Source	Estimated Project Life	Estimated Cost Benefit	Status	Estimated Total Capital Cost	Awarded Grant Funds	Unfunded District Cost	Reflects upstream to downstream approach: PROJECT SCHEDULE					
									2020	2021	2022	2023	2024	2025
<b>BONE LAKE MANAGEMENT DISTRICT</b>														
<b>MOODY LAKE</b>														
<i>Total P reduction needed to meet State/District goal of 40 µg/L:</i>	<b>879</b>	<b>(2007 CIP/2010 TMDL) - reviewed in 2014 as part of Moody Sequential Diagnostics</b>												
Rough Fish Harvest	--	Internal			Completed									
Carp Barrier	--	Internal			Completed									
Winter Aeration System	--	Internal			Completed									
Cattle Exclusion	--	Watershed			Completed									
Moody Lake Wetland Restoration	376	Watershed	25	\$74.47	Completed	\$700,000								
Whole Lake Alum Treatment	324	Internal	10	\$72.53	Completed	\$235,000								
Diagnostic/effectiveness monitoring	--				In-Progress	\$45,000	\$0	\$45,000						
Moody Lake SWA Implementation	24				In-Progress	Cost. under Bone Lake SWA Impl.								
Additional chemical treatment of wetland ponds	69	Watershed	10	\$72	Future Project	\$50,000	\$0	\$50,000						
Additional agricultural BMPs identified through diagnostic monitoring	TBD	Watershed			Future Project	\$50,000	\$0	\$50,000						
Lofton Pond Alum Treatment	TBD	Watershed			Future Project	\$0	\$0	\$0						
<b>Total Reductions Achieved or Identified</b>	<b>793</b>	<b>Subtotal Moody</b>						<b>\$145,000</b>						
Remaining Reductions to be Identified	86													
<b>BONE LAKE</b>														
<i>Total P reduction needed to meet 2040 District goal of 30 µg/L:</i>	<b>786</b>	<b>(2007 CIP) - to be updated in 2020</b>												
Upstream lake reduction goal achieved (Moody)	137	Upstream lake			In-Progress									
Rough Fish Harvest	--	Internal			Completed									
Carp Barrier	--	Internal			Completed									
Melanie Trail Field Perennial Vegetation Conversion	34	Watershed			Completed									
Internal Load Assessment (Bone)	--				In-Progress	\$15,000		\$15,000						
Drained Wetland Restorations	56	Watershed	10	\$321	In-Progress	\$110,000	\$88,000	\$22,000						
Bone Lake SWA Implementation	90	Watershed	10	\$200	In-Progress	\$180,000	\$144,000	\$36,000						
Diagnostic/effectiveness monitoring	--				Future Project	\$45,000	\$0	\$45,000						
Bone Lake Alum Treatment	TBD	Internal			Future Project	\$0	\$0	\$0						
Legacy load wetland rehabilitation	TBD	Watershed			Future Project	\$500,000	\$0	\$500,000						
228th W drainage agricultural BMPs	32	Watershed	20	\$469	Future Project	\$300,000	\$0	\$300,000						
<b>Total Reductions Achieved or Identified</b>	<b>349</b>	<b>Subtotal Bone</b>						<b>\$918,000</b>						
Remaining Reductions to be Identified	437	<b>Bone Lake District Total \$1,063,000</b>												

Projects	Estimated Annual P Reductions	Phosphorus Source	Estimated Project Life	Estimated Cost Benefit	Status	Estimated Total Capital Cost	Awarded Grant Funds	Unfunded District Cost	Reflects upstream to downstream approach: PROJECT SCHEDULE						
	lb/yr		yr	\$/lb P					2020	2021	2022	2023	2024	2025	2026
<b>LITTLE COMFORT LAKE MANAGEMENT DISTRICT</b>															
<b>BIRCH LAKE</b>															
<i>Total P reduction needed to meet State/District goal of 60 µg/L:</i>															
	<b>451</b>	<b>(2007 CIP)</b>													
Upstream lake reduction goal achieved (Bone)	128	<i>Upstream lake</i>			In-Progress										
Diagnostic/effectiveness monitoring	--				Completed	\$10,000	\$0	\$10,000							
Bone Lake Outlet Wetland Assessment	--				Completed										
Bone Lake Outlet Wetland water level monitoring	--				In-Progress	\$500	\$0	\$500							
Internal Load Assessment (Birch)	--				In-Progress	\$15,000	\$0	\$15,000							
Horse paddock management plan	5	<i>Watershed</i>	10	\$100	Future Project	\$5,000	\$0	\$5,000							
Internal Load Management (Birch)	TBD	<i>Internal</i>	10		Future Project	\$250,000	\$0	\$250,000							
<i>Bone Lake Outlet Wetland Restoration</i>	TBD	<i>Watershed</i>			Future Project	\$0	\$0	\$0							
<b>Total Reductions Completed or Identified</b>	<b>133</b>					<b>Subtotal Birch</b>		<b>\$280,500</b>							
Remaining Reductions to be Identified	318														
<b>SCHOOL LAKE</b>															
<i>Total P reduction needed to meet State/District goal of 40 µg/L:</i>															
	<b>477</b>	<b>(2007 CIP/2010 TMDL)</b>													
Upstream lake reduction goal achieved (Birch)	267	<i>Upstream lake</i>			In-Progress										
Diagnostic/effectiveness monitoring	--				In-Progress	\$10,000	\$0	\$10,000							
Internal Load Assessment (School)	--				In-Progress	\$15,000	\$0	\$15,000							
July Avenue Agricultural BMPs	TBD	<i>Watershed</i>			Future Project	\$50,000	\$0	\$50,000							
Internal Load Management (School)	46	<i>Internal</i>	10	\$543	Future Project	\$250,000	\$0	\$250,000							
<b>Total Reductions Completed or Identified</b>	<b>313</b>					<b>Subtotal School</b>		<b>\$325,000</b>							
Remaining Reductions to be Identified	164														
<b>LITTLE COMFORT LAKE</b>															
<i>Total P reduction needed to meet 2040 District goal of 30 µg/L:</i>															
	<b>839</b>	<b>(2007 CIP) - to be updated in 2020</b>													
Upstream lake reduction goal achieved (School)	215	<i>Upstream lake</i>			Completed										
Diagnostic/effectiveness monitoring	--				In-Progress	\$10,000	\$0	\$10,000							
Heath Avenue Outlet Assessment	--				In-Progress	\$0	\$0	\$0							
Internal Load Assessment (Little Comfort)	--				Future Project	\$15,000	\$0	\$15,000							
Heath Avenue Outlet Iron Enhanced Sand Filter	150	<i>Watershed</i>			Future Project	\$1,750,000	\$0	\$1,750,000							
Heath Avenue ditched wetland restoration	TBD	<i>Watershed</i>			Future Project	\$750,000	\$0	\$750,000							
School Lake Outlet Restoration	TBD	<i>Watershed</i>			Future Project	\$0	\$0	\$0							
Internal Load Management (Little Comfort)	278	<i>Internal</i>	10	\$90	Future Project	\$250,000	\$0	\$250,000							
<b>Total Reductions Completed or Identified</b>	<b>643</b>					<b>Subtotal Little Comfort</b>		<b>\$2,775,000</b>							
Remaining Reductions to be Identified	196					<b>Little Comfort Lake District Total</b>		<b>\$3,380,500</b>							

Projects	Estimated Annual P Reductions	Phosphorus Source	Estimated Project Life yr	Estimated Cost Benefit \$/lb P	Status	Estimated Total Capital Cost	Awarded Grant Funds	Unfunded District Cost	Reflects upstream to downstream approach: PROJECT SCHEDULE						
	lb/yr		yr						2020	2021	2022	2023	2024	2025	2026
<b>FOREST LAKE MANAGEMENT DISTRICT</b>															
<b>SHIELDS LAKE</b>															
<i>Total P reduction needed to meet State/District goal of 60 µg/L:</i>															
	<b>1023</b>	<b>(2015 Diagnostic Update)</b>													
Stormwater Harvest Reuse System	94	Watershed	25	\$396	Completed	\$930,335									
Street Sweeping Implementation	2	Watershed			Completed										
Chestnut Creek Permit	16	Watershed			In-Progress										
Shields Lake Alum Treatment	913	Internal	10	\$22	In-Progress	\$205,000	\$0	\$205,000							
Shields Lake Aerator Upgrade	--				In-Progress	\$35,000	\$0	\$35,000							
Castlewood: Ag. Field Perennial Vegetation Conversion	TBD	Watershed			In-Progress	\$5,000	\$0	\$5,000							
Carp harvest - rough fish management	--				Future Project										
<b>Total Reductions Completed or Identified</b>	<b>1025</b>					<b>Subtotal Shields</b>		<b>\$245,000</b>							
Remaining Reductions to be Identified	0														
<b>FOREST LAKE</b>															
<i>Total P reduction needed to meet 2040 District goal of 30 µg/L:</i>															
	<b>923</b>	<b>(2016 Diagnostic Update)</b>													
Upstream lake reduction goal achieved (Shields)	531	Upstream lake			In-Progress										
Hilo Lane Iron Enhanced Sand Filter	12	Watershed			Completed										
3rd Lake Pond Wetland Restoration	56	Watershed			Completed										
Street Sweeping Implementation	122	Watershed			Completed										
Castlewood Diagnostic & Feasibility	--				Completed										
WJD-6 Diagnostic & Feasibility	--				Completed										
Hayward Diagnostic & Feasibility	--				Completed										
Shields Lake Fish Barrier	--				Completed	\$30,000	\$24,000	\$6,000							
Castlewood: Ag. Field Perennial Vegetation Conversion	TBD	Watershed			In-Progress	\$5,000	\$0	\$5,000							
Forest Lake Internal Load Assessment	--				In-Progress	\$30,000	\$0	\$30,000							
Hayward: R14 Outlet Claros Phosphorus-Absorbing Treatment	TBD	Watershed			In-Progress	\$67,400	\$0	\$67,400							
WJD-6: CR50 Iron Enhanced Sand Filter	85	Watershed			In-Progress	\$1,250,000	\$0	\$1,250,000							
Hayward: R5 Agricultural best management practices	TBD	Watershed			Future Project	\$50,000	\$0	\$50,000							
Direct Drainage: Retrofit Implementation	37	Watershed	25	\$1,081	Future Project	\$1,000,000	\$0	\$1,000,000							
Hayward: R5/R15 outlet treatment options	TBD	Watershed			Future Project	\$200,000	\$0	\$200,000							
WJD-6: R7D Wetland Enhancement	TBD	Watershed			Future Project	\$250,000	\$0	\$250,000							
Diagnostic/effectiveness monitoring	--				Future Project	\$60,000	\$0	\$60,000							
Forest Lake Alum Treatment	TBD	Internal			Future Project	\$0	\$0	\$0							
Future Capital Projects (e.g., Castlewood)	TBD	Watershed			Future Project	\$750,000	\$0	\$750,000							
Direct Drainage: 6th Street Dead End Iron Enhanced Sand Filter	6	Watershed	25	\$0	Future Project	\$0	\$0	\$0							
<b>Total Reductions Completed or Identified</b>	<b>849</b>					<b>Subtotal Forest</b>		<b>\$3,668,400</b>							
Remaining Reductions to be Identified	74					<b>Forest Lake District Total</b>		<b>\$3,913,400</b>							

Projects	Estimated Annual P Reductions	Phosphorus Source	Estimated Project Life	Estimated Cost Benefit	Status	Estimated Total Capital Cost	Awarded Grant Funds	Unfunded District Cost	Reflects upstream to downstream approach: PROJECT SCHEDULE						
	lb/yr		yr	\$/lb P					2020	2021	2022	2023	2024	2025	2026
<b>COMFORT LAKE MANAGEMENT DISTRICT</b>															
<b>COMFORT LAKE</b>															
<b>Total P reduction needed to meet 2040 District goal of 30 µg/L:</b>	<b>825</b>	<b>(2010 TMDL) - to be updated in 2020, watershed reductions upstream of Shallow Pond reduced by 43% to account for treatment by Shallow Pond</b>													
Upstream lake reduction goal achieved (Little Comfort)	415	Upstream lake			In-progress										
Upstream lake reduction goal achieved (Forest)	15	Upstream lake			In-progress										
Broadway Iron Enhanced Sand Filter	15	Shallow Pond			Completed										
Target Improvements	5	Shallow Pond			Completed										
Bixby Park Water Quality Improvement Project	93	Shallow Pond			Completed										
Street Sweeping Implementation	22	Shallow Pond			Completed										
Comfort Lake Internal Load Assessment	--				In-progress	\$5,000	\$0	\$5,000							
Diagnostic/Effectiveness Monitoring	--				In-Progress	\$30,000	\$0	\$30,000							
Tax Forfeit Drained Wetland Restoration	80	Shallow Pond			In-progress	\$615,000	\$0	\$615,000							
Regional Stormwater Treatment Facility(ies)	TBD	Shallow Pond			Future Project	\$500,000	\$0	\$500,000							
Urban stormwater retrofits	TBD	Shallow Pond			Future Project	\$1,000,000	\$0	\$1,000,000							
Shallow Pond	TBD	To maintain 43% P removal			Future Project	\$500,000	\$0	\$500,000							
Ducharme Property	TBD	Shallow Pond			Future Project	\$0	\$0	\$0							
Comfort Lake Alum Treatment	101	Internal			Future Project	\$0	\$0	\$0							
<b>Total Reductions Completed or Identified</b>	<b>746</b>	<b>Comfort Lake District Total \$2,650,000</b>													
Remaining Reductions to be Identified	79														