

Lake Winnepesaukee Watershed Management Plan: Meredith, Paugus, & Saunders Bays, Phase I															
Potential Restoration Projects															
Ranking	Subwatershed	Town	Site Location	Description	Perceived problems/issues	BMP	BMP Type		Pollutant addressed	Property Public or Private?	Load Reduction	Cost	Tech. Assistance/ Resources Required	Potential Funding Sources	Time Table
							Struct.	Mgmt							
MB2	Meredith Bay Waukegan	Meredith	Waukegan Street, Meredith Village, US Route 3 and NH 25 corridor in and around the village	Catch Basin assessment, maintenance and retrofit.	Catch basin sediment capacities and characteristics; actual loads, potential for or occurrence of pass through of trapped material into water bodies and actual vs. optimal cleaning frequencies.	Catch Basin retrofits for off line CBS only	X	X	Sediment, salts, metals, phosphorus, nitrogen	Public/Private	Designed for maximum drainage of 0.25 acre impervious area. 15% TSS, 5% TN, and 5% TP removal efficiencies.	Estimated \$4200 per catch basin retrofit	UNH Stormwater Center, UMass Stormwater Technologies Clearinghouse	Local Municipal Budgets	On going, retrofit as budget allows
MB3	Meredith Bay Paugus Bay	Meredith Laconia Gilford	various	Vegetative buffer restoration and other possible BMP deployment on private residential lots and along streambanks	Outreach and partnerships needed with private citizens to promote importance of buffers in preventing erosion and trapping pollutants	Vegetative buffers	X		Sediment Phosphorus metals salts	Private	40 ft Buffer - 19% TP removal efficiency; 50 ft. buffer - 26% TP removal efficiency; 80 ft. buffer - 45% TP removal efficiency	Varies by buffer width and length needed (\$.40 - \$6.25 per linear ft. for a 20-50 ft wide buffer strip	LWWA, NHLA, BCCD, UNH Coop. Ext.	Public/Private	Ongoing
MB4	Meredith Bay Saunders Bay Paugus Bay	Meredith Laconia Gilford	various	Private beaches	erosion of beach sand into the lake	Perched beaches	X		Sand, phosphorus	Private	Varies by size of beach. 10-20 kg sediment annually based on 600sf. 0.003-0.006 kg P annually per beach (based on 300 mg P/kg sediment)	Varies by linear ft and sq. ft of beach area	NH DES Watershed Management Bureau ref: http://des.nh.gov/organization/divisions/water/wmb/vlap/2006/documents/appendix_d.pdf	Private	Ongoing effort over the next 10-15 yrs
MB5	Meredith Bay	Meredith	Meredith boat ramp - Hesky Park	Replacement/relocation of ramp drain	Current infiltration trench/drain is submerged rendering it non functional	Infiltration trench	X		Oil, grease, gas, nutrients, sediment	Public	Varies by size of drainage area. Based on 1 acre, estimated load reduction is 2 lbs/yr of N, TP, and 654 lbs/yr TSS. Estimated Efficiency Removals: 10% Nitrates, 60% TP, 75% TSS	\$5,000	Wetland permitting, Engineering design, Public Works Dept.	Meredith Public Works	1-5 yrs
MB6	Waukegan Meredith Bay	Meredith	Waukegan boat ramp	Installation of BMP's at the Waukegan Boat ramp such as an infiltration trench.	Boat oil and gas	Infiltration trench	X		Oil, grease, gas, nutrients, sediment	Public	Varies by size of drainage area. Based on 1 acre, estimated load reduction is 2 lbs/yr of N, TP, and 654 lbs/yr TSS. Estimated Efficiency Removals: 10% Nitrates, 60% TP, 75% TSS	\$5,000	Wetland permitting, Engineering design, Public Works Dept.	Meredith Public Works	1-5 yrs
MB7	Waukegan Meredith Bay	Meredith	Monkey Pond	Evaluate Monkey Pond to determine whether the wetland could or should be enhanced to provide optimum sediment and nutrient removal.	Monkey Pond is town owned, is the outfall from Reservoir Brook and receives substantial drainage from NH Route 104.	Wetland mitigation	X		Sediment Phosphorus, metals, salts	Public	NA	\$10-20,000	Wetland Scientist, NRCS, Hydrologist	NH DES Aquatic Resource Mitigation (ARM)Fund	1-5 yrs
MB8	Waukegan Meredith Bay	Meredith	West shore of Lake Waukegan	Restore/stabilize 200' of eroded stream channel on the west shore of L. Waukegan severely damaged in a prior flood event.	Streambank severely damaged in prior flood event - erosion and sediment	Streambank stabilization	X		Sediment Phosphorus	Public/Private	27 tons sediment/yr 24 lbs P/yr	\$50,000	NRCS, Engineering Design, NHDOT, Landowner Agreement, Wetlands Permit	NH DES Aquatic Resource Mitigation (ARM)Fund, NRCS Farm Bill	1-5 yrs
MB9	Waukegan Meredith Bay	Meredith	Saywood Brook - west shore of the lake at Wall St.	Mapping and evaluation of cross culverts along the railroad system and related catchments (i.e. Saywood Brook and Reservoir Brook)	sediment load from repeated railroad washouts at four locations. Some sites may be due to undersized drains	Assessment needed to determine BMPs.	X	X	Sediment Phosphorus	Public/Private	NA until assessment complete	\$10-20,000	NHDOT, Environmental Consultant	NH DES, NHDOT	1-5 yrs
MB10	Meredith Bay	Meredith	Hawkins Brook subwatershed	Conduct a detailed assessment of the Hawkins Brook sub-watershed to identify specific sources of non-point pollution and potential BMP's and/or wetland enhancements to help mitigate pollutant loads entering Meredith Bay.	water quality monitoring has demonstrated high conductivity, low dissolved oxygen, elevated phosphorus levels	Watershed assessment, wetland mitigation		X	phosphorus chlorides sediment	Public/Private	NA	\$10-20,000	BCCD, Conservation Comm, Private citizens, Environmental Consultant	NH DES Aquatic Resource Mitigation (ARM)Fund, NRCS Farm Bill	1-5 yrs
MB1	Meredith Bay	Laconia	Scenic Road, railroad crossing near Centenary Ave.	Steeply sloping paved area and sheet flow to Lake Winnepesaukee; potential culverts draining to the lake	Stormwater runoff will flow directly into the lake creating sediment loading and eutrophication issues. Drainage systems are undersized	gabion wall, increase drainage pipe size, plunge pool and swale at outlet	X		phosphorus chlorides sediment, oils, metals	Public/Private	65% TP removal efficiency. Estimate TP load reduction for 2 acre site - 2 lbs. TSS - reduce P load approx. 2 lbs for 2 acre site. Sediment load reduction 800 lbs	\$40,000	Geolnsight, Winnepesaukee River Basin Program	Public - Laconia DPW, WRBP	Fall 2011
PB1	Paugus Bay	Laconia, Gilford	Black Brook	Conduct an assessment of the Black Brook sub-watershed to identify specific sources of non-point pollution and potential BMP's and/or wetland enhancements to help mitigate pollutant loads entering Paugus Bay.	Commercial development along Union Ave borders Black Brook. Brook receives road, parking lot runoff	Vegetated Buffers, watershed assessment	X	X	sediment, phosphorus chlorides	Public & Private	To be determined after subwatershed assessment	Varies, multiple potential projects	Wetland Scientist, NRCS, Hydrologist	Public & Private	Ongoing for next 10 yrs
PB2	Paugus Bay	Laconia	Langley Brook	Conduct an assessment of the Langley Brook sub-watershed to identify specific sources of non-point pollution and potential BMP's and/or wetland enhancements to help mitigate pollutant loads entering Paugus Bay at Langley Cove.	elevated phosphorus levels, may be natural due to wetlands	subwatershed assessment		X	phosphorus	Private	To be determined after subwatershed assessment	\$10-20,000	NRCS Farm Bill, BCCD	Public & Private	1-5 yrs
PB3	Paugus Bay	Laconia	Paugus Park Rd., south end	South of Natures View development a ponded area exists	Possible outflow pipe issues.	infiltrate, Water quality unit with bypass	X		Sediments, nutrients, metals, salts	Public/Private	effective for up to 5 acres; TSS - 72%, TN 10%, TP 9% efficiency (~0.1 lbs P)	\$15,000	UNH Stormwater Center, Environmental Consultant (Geolnsight)	Laconia DPW	2015
PB4	Paugus Bay	Laconia	Weirs Blvd - Last Resort	Rock swale to French Drain corrugated pipe outlet to Winnepesaukee	Sediments running into the lake	Berms and filters remove pipe and create underground infiltration basin	X	X	Sediments, nutrients, metals, salts	Private	65% efficiency, 2 lbs TP/acre treatment area	\$10,000	Environmental Consultant (Geolnsight), Easements	Private, Laconia DPW	1-5 yrs
PB5	Paugus Bay	Laconia	Weirs Blvd - White Oaks Rd.	Stormwater runoff, high speed sediment flows ending up on Weirs Boulevard	Possible old outlet pipes to the lake.	Bioretention basin	X	X	Sediments, nutrients, metals, salts	Private	2.5 lbs TP/acre; 65% removal efficiency	\$15,000	Environmental Consultant (Geolnsight), Easements		1-5 yrs
PB6	Paugus Bay	Laconia	South Down Condo Assoc.	drainage ponds empty directly to lake	Fertilizers and mowed lawn areas to water's edge, goose droppings	Vegetated Buffers, no fertilizer application	X	X	phosphorus, E. coli	Private	256 acres impacted - 40 ft buffer along shoreline; 9 lbs P red	\$1-5,000	LWWA, BCCD, Outreach activities	Public/Private	1-5 yrs
SB1	Saunders Bay	Laconia	Wentworth Cove Rd/Summit Ave/Rt 11B	Beach sand stabilization and stormwater runoff from Governor's Crossing Bridge	Over time rilling will cause runoff to flow into Lake Winnepesaukee	Vegetated buffers and berms to catch sediments & filter runoff	X	X	Phosphorus salt & sediments	Private	45% TP removal efficiency, approx. 1.3 lb TP for 1.5 acres	\$10-15,000	Geo. Hydrologist	Laconia DPW	1-5 yrs

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SB2	Saunders Bay	Gilford	Hoyt Rd. - Gunstock Brook	brook transports a lot of sediment at snowmelt and during heavy rain events	sediment load from sand and gravel pit, Gunstock Brook carries to Saunders Bay	Clean out existing sediment & erosion control structures. Vegetate excavation sites not being used. Re-establish woody vegetation within the brook's riparian buffer. Replace undersized culvert with bridge	X	X	sediment, phosphorus	Private	Wet Extended Detention Pond would remove ~68% TP, 80% TSS, and 55% TN. Vegetated Buffers within riparian zone would remove ~45% TP, 73% TSS, and 40% TN	\$30,000	NRCS, BCCD, Landowner Agreement	NRCS Farm Bill Programs, ARM Grants	2010-2015
SB3	Saunders Bay	Gilford	Gunstock Brook, Intervale Rd.	100' of streambank is severely eroded with scour hole 40' in height at apex, with the average 25' in height	Areas of highly eroded streambank - potential blockage of stream and heavy sediment load	Streambank Stabilization	X		sediment phosphorus chlorides	Private	46.7 tons sediment/yr 41.2 lbs P/yr	\$65,000	NRCS, Hydrologist, U.S. G.S., Fluvial Geomorphology Assessment, Landowner Agreement, NHDES	NH HSEM, NHDES	2011-2016
SB4	Saunders Bay	Gilford	Gunstock Brook, Henderson Rd.	200' of streambank is eroded with vertical walls 8' in height	Erosion of the streambank is contributing sediment to the stream and resulting in loss of agricultural land	Streambank Stabilization	X		sediment, Phosphorus	Private	27 tons sediment/yr lbs P/yr	\$51,000	NRCS, Hydrologist, U.S. G.S., Fluvial Geomorphology Assessment, Landowner Agreement, NHDES	NH HSEM, NHDES, NRCS Farm Bill	2011
SB5	Saunders Bay	Gilford	Gunstock Brook, upstream of Route 11 Bridge	Two sites along Gunstock Brook are eroded and unstable. The first site is 200' upstream from the bridge. The scour is 130' long and the bank is 10' high. The second site is 400' upstream of the bridge, and is 90' long scour that is 8' in height.	Areas of highly eroded streambank - potential blockage of stream and heavy sediment load	Streambank Stabilization	X		sediment, Phosphorus	Private	37.8 tons sediment/yr lbs P/yr	\$68,000	NRCS, Hydrologist, U.S. G.S., Fluvial Geomorphology Assessment, Landowner Agreement, NHDES	NH HSEM, NHDES	2011-2016
SB6	Saunders Bay	Gilford	Gunstock Brook, downstream of Route 11 bridge	Two sites along Gunstock Brook are eroded and unstable. The first site is 200' downstream from the bridge, behind Patrick's Restaurant. The scour is 120' long and the bank is 9' high. The second site is 350' downstream of the bridge, and is 115' long scour that is 8' in height.	Areas of highly eroded streambank - heavy sediment load	Streambank Stabilization	X		sediment, Phosphorus	Private	37.4 tons sediment/yr lbs P /yr	\$61,000	NRCS, Hydrologist, U.S. G.S., Fluvial Geomorphology Assessment, Landowner Agreement, NHDES	NH HSEM, NHDES	2011-2016
SB7	Saunders Bay	Gilford	Rt. 11B/Old Lakeshore Rd.	Wetlands restoration/protection of Meadows area	potential impact to wetlands area from athletic field development - affecting drainage patterns, decreased flood storage. Increased erosion and sedimentation	Assessment needed to determine BMPs.		X	sediment phosphorus	Gilford School Board	to be determined after assessment	\$10-15,000	NRCS, BCCD, Wetland Scientists	State/ARM Grant, Private	2011-2014