

appendix J - plan implementation cost estimate

Implementation of this plan will require the development of partnerships with local, state, and federal organizations for implementation, technical assistance, and funding. Tables J1 through J6 summarize estimated financial assistance needed to implement the action recommendations. It includes areas / quantities for implementation, initial and annual unit costs, initial and annual total costs, parties responsible for action implementation, and anticipated staff administrative effort. Initial costs indicate cost for installation and/or establishment; annual costs indicate cost for ongoing management and maintenance. Table J7 presents the unit cost information used to estimate implementation costs for plan action recommendations.

Table J1 City of Zion Plan Implementation Cost Estimate

ID# (SMU reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
1.0.1	Zion	<i>Preserve Category 1 and 2 green infrastructure open space areas to connect the North and South units of Illinois Beach State Park, enhance recreational opportunities, and expand and restore important rare habitat. Decommission and remove the power plant and associated structures. Acreage count includes private / utility owned land within the area. It is assumed that restoration would address the potential pollutant loading hotspots identified as Critical Subbasins #15 and #74.</i>	382	acres	1	\$0	\$0	\$0	\$0
2.0.3	Zion	<i>Manage / minimize runoff impacts of commercial land uses along Sheridan Road, particularly at Sheridan and 33rd St and Sheridan and 27th, 28th, and 29th along the stream. Cost estimate assumes 8400 lf of Sheridan Road frontage treated with improved, 10' swales (approximately 2 acres) as a proxy for on-site source control BMPs.</i>	2	acre	1	\$0	\$0	\$0	\$0
2.0.6	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address algae / nutrient loads and turbidity / sedimentation by naturalizing the basin; remove excess debris.	1100	lf	1	\$125	\$2	\$137,500	\$1,650
2.0.7	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address turbidity / sedimentation by naturalizing the basin; remove excess debris. This is depressional area #54.	2000	lf	1	\$125	\$2	\$250,000	\$3,000
2.0.8	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address algae / nutrient loads by naturalizing the basin; remove excess debris.	2100	lf	1	\$125	\$2	\$262,500	\$3,150
2.0.9	Zion	Address algae / nutrient loads by naturalizing the basin. 1		ea	1	\$2,500	\$250	\$2,500	\$250

Table J1 City of Zion Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
2.28.1	Zion	Restore stream channel and improve instream habitat by installing pools and riffles.	2700	lf	1	\$0	\$0	\$0	\$0
2.28.2	Zion	<i>Restore and manage the channel, native riparian buffers, and ravine woodland system, particularly the reach running through Ophir Park west of Sheridan Road, and Carmel Park east of Sheridan Road. Management practices include controlling invasive species, planting native species, and managing vegetation such as through prescribed burning.</i>	2700	lf	2	\$0	\$0	\$0	\$0
2.28.3	Zion	<i>Stabilize and reduce downcutting of the incised channel through Ophir Park, and install a naturalized riparian buffer. Cost estimate assumes stabilization of streambanks with Moderate erosion problem.</i>	750	lf	2	\$50	\$2	\$75,000	\$2,250
2.28.4	Zion	Manage the culvert outflow at the upstream end of the reach for energy dissipation and pollutant removal, possibly with a settling basin or small constructed wetland.	1	ea	1	\$0	\$0	\$0	\$0
2.28.5	Zion	<i>Stabilize Moderate streambank erosion along the entire reach using bioengineering stabilization measures, which will help reduce the instream silt / sedimentation load within this reach.</i>	2700	lf	2	\$50	\$2	\$270,000	\$8,100
2.28.6	Zion	Remove debris, tires, and logs using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
2.28.7	Zion	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
2.28.8	Zion	Remove concrete debris and remove or repair failed headwall and outfall pipe.	1	ea	1	\$0	\$0	\$0	\$0
2.28.9	Zion	<i>Stabilize major erosion, bank slumping / blowout, and headwall failure at upstream end of the reach near the culvert. Use bioengineering stabilization measures if possible, and more structural measures if necessary. Cost estimate reflects stabilization of severe erosion problem.</i>	1	ea	1	\$0	\$0	\$0	\$0
2.28.10	Zion	<i>Stabilize 4 foot diameter plunge pool erosion below outfall. If feasible use bioengineering measures, though rip rap and structural measures may be necessary.</i>	1	ea	1	\$0	\$0	\$0	\$0
2.28.11	Zion	<i>Stabilize bank erosion caused by stormwater outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
2.28.12	Zion	Inspect and, if necessary, repair five culverts under trail, which may be crushed and/or failing.	5	ea	1	\$0	\$0	\$0	\$0

Table J1 City of Zion Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3a.0.3	Zion	Preserve approximately 21 acres of wetland and stream corridor open and partially open Category 1 green infrastructure areas and greenways within the headwaters of the 27th St tributary. Target areas are located (1) southwest of 25th St and Galilee, (2) south of Jethro and 26th Street, (3) west of 26th and Lewis, (4) southeast of 26th and Lewis, (5) northwest of 29th and Lewis.	21	acre	1	\$0	\$0	\$0	\$0
3a.0.7	Zion	Manage the golf course grounds and detention / water features in Shiloh Park, in the northeast corner of the SMU for water quality and habitat benefits, including installation of a 5 foot riparian buffer along shoreline / banks of water features.	2300	lf	1	\$0	\$0	\$0	\$0
3a.0.8	Zion	FPAI site 20-13 experiences local drainage problems due to runoff from the west. Retrofit David Park and the school property west of the problem area with detention or infiltration practices to reduce runoff rate and volume.	NA	NA	NA	NA	NA	NA	NA
3a.0.9	Zion	Stabilize / regrade shoreline using bioengineering practices and plant banks and a minimum 5 ft buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address turbidity / sedimentation by naturalizing the basin.	350	lf	1	\$125	\$2	\$43,750	\$525
3a.0.10	Zion	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
3a.0.11	Zion	Retrofit as wet / wetland basin; plant banks and a minimum 5 ft surrounding buffer with native vegetation.	300	lf	1	\$125	\$2	\$37,500	\$450
3a.0.12	Zion	Retrofit as wet / wetland basin; plant banks and a minimum 5 ft surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; remove excess debris.	400	lf	1	\$125	\$2	\$50,000	\$600
3a.0.13	Zion	Retrofit as wet / wetland basin; plant banks and a minimum 5 ft surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; retrofit bottom concrete channel.	400	lf	1	\$125	\$2	\$50,000	\$600
3a.0.14	Zion	Plant banks and a minimum 5 ft surrounding buffer with native vegetation; remove excess debris.	700	lf	1	\$125	\$2	\$87,500	\$1,050
3a.0.15	Zion	Stabilize / regrade shoreline using bioengineering practices and native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address algae / nutrient loads by naturalizing the basin; remove excess debris.	760	lf	1	\$125	\$2	\$95,000	\$1,140
3a.0.16	Zion	Stabilize / regrade shoreline and plant banks and a minimum 5 ft surrounding buffer with native vegetation; address turbidity / sedimentation.	800	lf	1	\$125	\$2	\$100,000	\$1,200

Table J1 City of Zion Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3a.0.17	Zion	Plant banks and a minimum 5 ft surrounding buffer with native vegetation; address turbidity / sedimentation by naturalizing the basin.	1400	lf	1	\$125	\$2	\$175,000	\$2,100
3a.27.1	Zion	Restore and manage the native riparian buffer plant communities along this reach within Sharon Park by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. A wider, partially forested buffer may be appropriate in the lower parts of the reach.	2000	lf	2	\$0	\$0	\$0	\$0
3a.27.2	Zion	Address High streambank erosion along entire reach using bioengineering stabilization measures, some of which may threaten buried sewer lines.	2000	lf	2	\$100	\$2	\$400,000	\$6,000
3a.27.3	Zion	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3a.27.4	Zion	<i>Remediate significant erosion and slumping on left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3a.27.5	Zion	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3a.27.6	Zion	<i>Stabilize significant erosion and exposure of manhole and sewer infrastructure using bioengineering stabilization measures and other hardscape solutions to ensure protection of the infrastructure elements. Length difficult to determine from photo; assume 100 lf for cost estimation purposes.</i>	100	lf	1	\$0	\$0	\$0	\$0
3a.27.7	Zion	<i>Stabilize erosion creating open channel at discharge point using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3a.27.8	Zion	<i>Remediate significant erosion and slumping on left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 150 lf for cost estimation purposes.</i>	150	lf	1	\$50	\$2	\$7,500	\$225
3a.27.9	Zion	<i>Stabilize erosion at outfall that is creating an open channel using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3a.27.10	Zion	<i>Stabilize major erosion, headwall, and outfall pipe failure using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3a.27.11	Zion	<i>Stabilize minor channel erosion using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0

Table J1 City of Zion Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.22.1	Zion	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	1200	lf	2	\$0	\$0	\$0	\$0
3c.22.2	Zion	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
1.0.3	Beach Park	Preserve and restore open and partially open green infrastructure bounded by North Ave, York House Road, Sheridan Road, and residential areas to the north (spanning SMUs #1, #3b, and #3c) for natural resource restoration and management and recreation. Preserving two corridors (19 acres) east of Sheridan Road would connect this piece to the larger Illinois Beach State Park system. The area also contains storage area #30 and potential storage area #27, which may help reduce flooding in the area of FPAI 20-02 along Coolidge Ave.	99	acres	1	\$0	\$0	\$0	\$0
1.0.8	Beach Park	Monitor IDOT-recorded flooding location at Sheridan and York House Road for further problems. 1		ea	1	\$0	\$0	\$0	\$0
1.0.9	Beach Park	Monitor IDOT-recorded flooding locations at Sheridan and Beach Road for further problems.	1	ea	1	\$0	\$0	\$0	\$0
1.0.14	Beach Park	Install filtration and infiltration BMPs for existing commercial properties along Sheridan Road. Cost estimate reflects 10' wide swale improvements (as a proxy for lot level / source control BMPs) along 1500 lf of Sheridan Road frontage.	0	acres	1	\$0	\$0	\$0	\$0
1.0.15	Beach Park	Improve any swale and other surface stormwater drainage systems within the developed areas of the western part of this SMU, which is mostly unsewered, and install stormwater filtration and infiltration BMPs. Details reflect 54,000 lf (approximately 12.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of roads within this part of the SMU.	13	acres	1	\$0	\$0	\$0	\$0
1.0.23	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
1.0.24	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
1.0.27	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
2.0.5	Beach Park	Monitor past IDOT-recorded flooding at Sheridan and Wadsworth for further problems and remediate if flooding continues.	1	ea	1	\$0	\$0	\$0	\$0
3a.25.4	Beach Park	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
3a.26.1	Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. A wider, partially forested buffer is appropriate in the lower parts of the reach.	2000	lf	2	\$0	\$0	\$0	\$0
3a.26.2	Beach Park	Restore stream channel and improve instream habitat by installing & enhancing pools and riffles.	2000	lf	1	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3a.26.3	Beach Park	<i>Address Moderate streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the silt and sediment load.</i>	2000	lf	2	\$50	\$2	\$200,000	\$6,000
3a.26.4	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	2000	lf	2	\$0	\$0	\$0	\$0
3a.26.5	Beach Park	Remove chain link fence placed across stream channel. 1		ea	1	\$0	\$0	\$0	\$0
3a.26.6	Beach Park	<i>Remediate significant erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$50	\$2	\$5,000	\$150
3a.26.7	Beach Park	Investigate and remediate collapsed pedestrian bridge in the stream channel.	1	ea	1	\$0	\$0	\$0	\$0
3b.0.2	Beach Park	Consider daylighting and restoring as much of the Wilson Avenue Tributary (not inventoried) as possible through the residential areas. Daylighting and restoration should address concerns about the tank cars and transite pipes that are reported to transmit the flow below ground in this location.	4000	lf	1	\$0	\$0	\$0	\$0
3b.0.3	Beach Park	Buffer the Wilson Avenue Tributary from encroachment by preserving open Category 2 green infrastructure areas.	3	acres	1	\$0	\$0	\$0	\$0
3b.0.5	Beach Park	Restore and manage the wetlands within the open and partially open Category 1 Green Infrastructure areas just north of Lyons Woods Forest Preserve; reconnect these wetlands to the Lyons Woods system.	7	acres	1	\$0	\$0	\$0	\$0
3b.0.8	Beach Park	FPAI site 20-04, in the Village of Beach Park, experiences sewer backup into homes due to an inadequate drainage system. Investigate whether the remedial measure, a large pipe and ditch installed as part of the Monarch Point development to the north, fixed the problem. If not, remedial action should be taken, which may include working with the open areas identified on the SMU map to relieve drainage issues.	9	acres	1	NA	NA	NA	NA
3b.0.9	Beach Park	FPAI site 20-05, in the Village of Beach Park, experiences road, home, and backyard flooding due to inadequate conveyance capacity of the open ditch and culvert, particularly the culvert under Yorkhouse Road. Remedial action may include retrofit / restoration of open green infrastructure areas to help absorb / store flood water.	14	acres	1	NA	NA	NA	NA
3b.0.10	Beach Park	The area where BL13, BL14, and BL15 come together is in need of a stream restoration plan to remediate the buildup of debris, concrete lined channels, underground culverts and railroad tank cars, yard waste in the stream channel, and other impacts from nearby residential areas.	400	lf	1	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3b.0.11	Beach Park	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address turbidity / sedimentation by naturalizing the basin.	800	lf	1	\$125	\$2	\$100,000	\$1,200
3b.0.13	Beach Park	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup.	500	lf	1	\$125	\$2	\$62,500	\$750
3b.0.14	Beach Park	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation.	500	lf	1	\$125	\$2	\$62,500	\$750
3b.0.17	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
3b.0.18	Beach Park	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
3b.0.19	Beach Park	Plant banks with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; remove excess debris.	650	lf	1	\$125	\$2	\$81,250	\$975
3b.0.20	Beach Park	Convert to wet or wetland basin; plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup.	850	lf	1	\$125	\$2	\$106,250	\$1,275
3b.0.21	Beach Park	Plant banks and a surrounding buffer with native vegetation; remove excess debris.	1200	lf	1	\$25	\$2	\$30,000	\$1,800
3b.12.1	Beach Park	<i>Restore stream channel and improve instream habitat by installing and enhancing pools and riffles.</i>	1900	lf	1	\$0	\$0	\$0	\$0
3b.12.2	Beach Park	<i>Address High streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the instream silt / sedimentation load.</i>	1900	lf	2	\$100	\$2	\$380,000	\$5,700
3b.12.3	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	1900	lf	2	\$0	\$0	\$0	\$0
3b.12.4	Beach Park	Investigate / inspect failed / broken concrete dam along west of Cheney / North Ave. for impact on stream, and remove impacting dam elements if found be have a negative impact.	1	ea	1	\$0	\$0	\$0	\$0
3b.12.5	Beach Park	<i>Stabilize typical 1-2 foot erosion on right bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3b.12.6	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3b.12.7	Beach Park	<i>Stabilize significant erosion and slumping of right bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3b.12.8	Beach Park	<i>Remove debris and sediment from culvert under Beach Road.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.12.9	Beach Park	<i>Remediate erosion of open point discharge channel draining to the creek using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.12.10	Beach Park	<i>Remediate erosion of open point discharge channel draining to the creek using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.13.1	Beach Park	Manage and restore the wooded ravine along reach BL13. Assumes an area 2500 lf by 150 ft in width for cost estimating purposes.	9	acre	1	\$0	\$0	\$0	\$0
3b.13.2	Beach Park	<i>Restore stream channel and improve instream habitat by installing and enhancing pools and riffles and removing numerous debris jams according to the American Fisheries Society guidelines.</i>	3000	lf	1	\$0	\$0	\$0	\$0
3b.13.3	Beach Park	<i>Address High streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the instream silt / sedimentation load.</i>	3000	lf	2	\$100	\$2	\$600,000	\$9,000
3b.13.4	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	3000	lf	2	\$0	\$0	\$0	\$0
3b.13.5	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	3000	lf	2	\$0	\$0	\$0	\$0
3b.13.6	Beach Park	Inspect footbridges and armored / concrete-lined banks and remediate if found to be negatively impacting the stream.	1	ea	1	\$0	\$0	\$0	\$0
3b.13.7	Beach Park	<i>Restore channel reach near Wilson Avenue by installing pool and riffle structures and stabilizing streambanks.</i>	200	lf	1	\$0	\$0	\$0	\$0
3b.13.8	Beach Park	Remove concrete debris dumping / fill just upstream of Beach Rd culvert from property / operation at Tewes and Beach.	1	ea	1	\$0	\$0	\$0	\$0
3b.13.9	Beach Park	<i>Remediate significant erosion and slumping of right bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3b.13.10	Beach Park	<i>Inspect and assess fencing across channel and rock wall armoring and remove if found to impair the conveyance of water.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.13.11	Beach Park	<i>Remove concrete from channel and restore stream channel by stabilizing streambanks and installing habitat features such as pools and riffles and rootwads. Assumes 150 lf of stream channel needs attention for cost estimation purposes.</i>	150	lf	1	\$0	\$0	\$0	\$0
3b.13.12	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.13.13	Beach Park	<i>Remove debris and sediment from culvert under Beach Road.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.13.14	Beach Park	<i>Address failed concrete wall armoring and major erosion behind the armoring by removing the concrete and using bioengineering stabilization measures. Assumes 100lf of stream channel needs attention for cost estimation purposes.</i>	100	lf	1	\$0	\$0	\$0	\$0
3b.13.15	Beach Park	<i>Repair or replace broken concrete and corrugated metal pipe culvert and remove debris obstructing flow.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.13.16	Beach Park	<i>Stabilize erosion at and below outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.13.17	Beach Park	<i>Repair failed clay outfall pipe and address erosion around outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.14.1	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	500	lf	2	\$0	\$0	\$0	\$0
3b.14.2	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	500	lf	2	\$0	\$0	\$0	\$0
3b.14.3	Beach Park	<i>Conduct major channel restoration by removing debris and restoring a natural channel to this concrete-lined drainage ditch.</i>	50	lf	1	\$0	\$0	\$0	\$0
3b.15.10	Beach Park	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.15.11	Beach Park	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3b.15.12	Beach Park	<i>Remove debris at the outfall discharge points.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.17.1	Beach Park	Restore stream channel and improve instream habitat by enhancing pools and riffles.	2400	lf	1	\$0	\$0	\$0	\$0
3b.17.2	Beach Park	Address Moderate streambank erosion along entire reach using bioengineering stabilization measures.	2400	lf	2	\$50	\$2	\$240,000	\$7,200
3b.17.3	Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	2400	lf	2	\$0	\$0	\$0	\$0
3b.17.4	Beach Park	Inspect footbridges and armored / concrete-lined banks along this reach for impacts on the stream corridor and remediate if necessary.	1	ea	1	\$0	\$0	\$0	\$0
3b.17.5	Beach Park	Remove broken concrete slab streambank armoring and restore channel to natural channel condition. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.	50	lf	1	\$0	\$0	\$0	\$0
3b.17.6	Beach Park	Restore a minimum 5 foot wide, deep-rooted native plant buffer to the stream edge within the golf course.	600	lf	2	\$0	\$0	\$0	\$0
3b.17.7	Beach Park	Remove debris at outfall.	1	ea	1	\$0	\$0	\$0	\$0
3b.17.8	Beach Park	Stabilize significant erosion and bank slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.	50	lf	1	\$100	\$2	\$5,000	\$75
3b.17.9	Beach Park	Remove debris blocking culvert and repair, remediate, and/or stabilize the exposed culvert.	1	ea	1	\$0	\$0	\$0	\$0
3b.17.10	Beach Park	Stabilize erosion undermining the culvert, preferably using bioengineering stabilization measures but also using more structural measures if necessary.	1	ea	1	\$0	\$0	\$0	\$0
3c.0.9	Beach Park	FPAI site 20-02, in the Village of Beach Park, experiences flooding due to inadequate outlets and poor drainage. There is a backyard drainage ditch between Beach and Howard, Sheridan and Geraghty (depressional storage #49) and extending along Coolidge Rd to the north (depressional storage #50) that are likely part of the cause of flooding. Investigate whether the new storm sewer along Coolidge Avenue has eliminated flooding in this location. If flooding persists, additional solutions may include improvement of drainage overland flow paths and installation of additional storm sewer capacity to alleviate the problem.	NA	NA	NA	NA	NA	NA	NA

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.0.10	Beach Park	Monitor past IDOT-recorded flooding locations at Sheridan and Wadsworth, Sheridan and Talmadge / Michigan, and Sheridan and Beach Rd. to determine whether flooding is still occurring at these sites. If so, develop and implement flood mitigation strategies.	1	ea	1	\$0	\$0	\$0	\$0
3c.0.14	Beach Park	Stabilize / regrade shoreline and plant banks and a surrounding buffer with native vegetation.	650	lf	1	\$125	\$2	\$81,250	\$975
3c.0.15	Beach Park	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address algae / nutrient loads and turbidity / sedimentation by naturalizing the basin.	600	lf	1	\$125	\$2	\$75,000	\$900
3c.0.16	Beach Park	Retrofit as wet / wetland basin; stabilize / regrade shoreline and plant banks and a surrounding buffer with native vegetation.	300	lf	1	\$125	\$2	\$37,500	\$450
3c.0.18	Beach Park	Plant banks and a surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup.	375	lf	1	\$125	\$2	\$46,875	\$563
3c.7.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	1800	lf	2	\$0	\$0	\$0	\$0
3c.7.4	Beach Park	Assess side slope seeps for restoration potential. Restore if possible.	2	acre	1	\$0	\$0	\$0	\$0
3c.7.5	Beach Park	Remove massive debris jam approximately 300' downstream of Sheridan Road and stabilize channel.	1	ea	1	\$0	\$0	\$0	\$0
3c.8.1	Beach Park	<i>Address High streambank erosion along entire reach, some threatening homes and property, using bioengineering stabilization measures.</i>	2000	lf	2	\$100	\$2	\$400,000	\$6,000
3c.8.2	Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	2000	lf	2	\$0	\$0	\$0	\$0
3c.8.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	2000	lf	2	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.8.4	Beach Park	<i>Repair broken cement outfall pipe and stabilize surrounding erosion using bioengineering stabilization measures. Location is approximately 300' upstream of Sheridan Rd.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.5	Beach Park	<i>Stabilize streambank erosion across from the sewer / manhole stabilization project along the reach near the Garaghty / California intersection. Length of problem is unknown; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	50	lf	1	\$50	\$2	\$2,500	\$75
3c.8.6	Beach Park	<i>Stabilize minor channel erosion and downcutting of channel outfall using bioengineering stabilization measures and energy dissipation measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.7	Beach Park	<i>Stabilize major erosion behind headwall and below outfall preferably using bioengineering stabilization measures but may also require more structural measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.8	Beach Park	<i>Stabilize moderate channel erosion and downcutting using bioengineering stabilization measures and, if necessary, check dams.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.9	Beach Park	<i>Address major erosion and slumping on left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	50	lf	1	\$100	\$2	\$5,000	\$75
3c.8.10	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.11	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.12	Beach Park	<i>Monitor sewer manhole, which rises 6 feet above stream elevation, for leakage and infiltration problems.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.13	Beach Park	<i>Stabilize major erosion and slumping of ravine bank using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.8.14	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.9.1	Beach Park	<i>Restore stream channel and improve instream habitat by installing and enhancing pools and riffles and installing boulders, large rocks, and / or rootwads.</i>	2500	lf	1	\$0	\$0	\$0	\$0
3c.9.2	Beach Park	<i>Stabilize High streambank erosion along entire reach using bioengineering stabilization measures.</i>	2500	lf	2	\$100	\$2	\$500,000	\$7,500

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.9.3	Beach Park	<i>Restore the native riparian buffer (manage native riparian plant communities within this reach: control invasive species, plant native species, thin shrub layer to allow more understory growth, and manage vegetation such as through prescribed burning.)</i>	2500	lf	2	\$0	\$0	\$0	\$0
3c.9.4	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	2500	lf	2	\$0	\$0	\$0	\$0
3c.9.5	Beach Park	<i>Stabilize major erosion with slumping on the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	50	lf	1	\$100	\$2	\$5,000	\$75
3c.9.6	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.9.7	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.9.8	Beach Park	<i>Remove debris around plastic outfall pipe.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.9.9	Beach Park	<i>Stabilize major erosion on the left bank using bioengineering stabilization measures.</i>	100	lf	1	\$0	\$0	\$0	\$0
3c.9.10	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.9.11	Beach Park	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.9.12	Beach Park	<i>Stabilize major erosion and slumping of the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3c.10.1	Beach Park	<i>Stabilize High streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the silt / sediment accumulation within this reach.</i>	800	lf	2	\$100	\$2	\$160,000	\$2,400
3c.10.2	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	800	lf	2	\$0	\$0	\$0	\$0
3c.10.3	Beach Park	<i>Stabilize major erosion and slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.10.4	Beach Park	<i>Stabilize erosion around capped outfall pipe using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.11.1	Beach Park	<i>Stabilize High streambank erosion along entire reach using bioengineering stabilization measures.</i>	2500	lf	2	\$100	\$2	\$500,000	\$7,500
3c.11.2	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	2500	lf	2	\$0	\$0	\$0	\$0
3c.11.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	2500	lf	2	\$0	\$0	\$0	\$0
3c.11.4	Beach Park	Remove debris obstructing culverts.	1	ea	1	\$0	\$0	\$0	\$0
3c.11.5	Beach Park	Remove debris from outfall channel and assess armoring for impact on stream; if negative impact is found, remove armoring and stabilize with bioengineering approach.	1	ea	1	\$0	\$0	\$0	\$0
3c.11.6	Beach Park	<i>Stabilize major erosion and slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3c.11.7	Beach Park	<i>Repair / remediate erosion below outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.11.8	Beach Park	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
3c.11.9	Beach Park	<i>Stabilize major erosion occurring behind armoring on the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3c.11.10	Beach Park	<i>Assess wood armoring / retention wall for stability and feasibility of bioengineered approach to bank stabilization. Assumes 100lf of stream channel, both sides for cost estimation purposes.</i>	100	lf	2	\$0	\$0	\$0	\$0
3c.19.1	Beach Park	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	1900	lf	2	\$50	\$2	\$190,000	\$5,700
3c.19.2	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	1900	lf	2	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.19.3	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	1900	lf	2	\$0	\$0	\$0	\$0
3c.19.4	Beach Park	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
3c.19.5	Beach Park	<i>Stabilize significant erosion and slumping on the left bank using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3c.19.6	Beach Park	<i>Stabilize channel erosion and downcutting of discharge channel using bioengineering stabilization measures and check dams or other grade stabilization measures if necessary.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.19.7	Beach Park	<i>Stabilize channel erosion and downcutting of discharge channel using bioengineering stabilization measures and check dams if necessary.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.20.1	Beach Park	Restore stream channel and improve instream habitat by installing and enhancing pools and riffles. 3600		lf	1	\$0	\$0	\$0	\$0
3c.20.2	Beach Park	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	3600	lf	2	\$50	\$2	\$360,000	\$10,800
3c.20.3	Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	3600	lf	2	\$0	\$0	\$0	\$0
3c.20.4	Beach Park	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	3600	lf	2	\$0	\$0	\$0	\$0
3c.20.5	Beach Park	<i>Stabilize significant erosion and slumping using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$50	\$2	\$5,000	\$150
3c.20.6	Beach Park	<i>Stabilize significant erosion and attempted stabilization debris around culvert using bioengineering stabilization measures</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.20.7	Beach Park	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
3c.20.8	Beach Park	<i>Stabilize channel erosion and downcutting of discharge channel using bioengineering stabilization measures and check dams if necessary.</i>	1	ea	1	\$0	\$0	\$0	\$0

Table J2 Village of Beach Park Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.20.9	Beach Park	<i>Stabilize erosion around culvert using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.20.10	Beach Park	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.20.11	Beach Park	Repair or remediate cracked concrete armoring at outfall.	10	lf	1	\$0	\$0	\$0	\$0
3c.24.1	Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	2000	lf	2	\$0	\$0	\$0	\$0
3c.24.2	Beach Park	Remove debris including tires.	1	ea	1	\$0	\$0	\$0	\$0
4.0.1	Beach Park	Preserve and restore the ravine within the open Category 1 green infrastructure area between Ganster Road and Sheridan Road, just east of Lyons Woods Forest Preserve.	10	acres	1	\$0	\$0	\$0	\$0
4.0.6	Beach Park	Expand / enlarge detention basins #28, #75, and #76 to reduce IDOT-recorded flooding locations along Sheridan Road north of Blanchard.	1	ea	1	\$0	\$0	\$0	\$0
4.0.9	Beach Park	Inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address algae / nutrients by naturalizing the basin; remove excess debris.	650	lf	1	\$125	\$2	\$81,250	\$975
4.05.3	Beach Park	Remove debris / bricks in channel.	1	ea	1	\$0	\$0	\$0	\$0
4.05.4	Beach Park	<i>Stabilize bank erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 50 lf and 1 side of stream for cost estimation purposes.</i>	50	lf	1	\$50	\$2	\$2,500	\$75

Table J3 City of Waukegan Plan Implementation Cost Estimate

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
1.0.7	Waukegan	Preserve and restore the green infrastructure areas in the southwest corner of the SMU, east of the Union Pacific rails and west of industrial land uses (Midwest Generation, North Shore Sanitary District, and Outboard Marine Corporation). This area has been identified by the City of Waukegan for restoration as the 'Waukegan Moorlands'.	52	acres	1	\$0	\$0	\$0	\$0
1.0.10	Waukegan	Investigate the wetlands adjacent to the Johns Manville lagoons for restoration and remediation potential and as a possible water quality improvement facility for water runoff from nearby industrial sites. Cost reflects standard wetland restoration and management rather than clean up and remediation.	35	acres	1	\$0	\$0	\$0	\$0
1.1.1	Waukegan	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	2000	lf	2	\$0	\$0	\$0	\$0
1.1.3	Waukegan	<i>Restore stream channel and instream habitat by reducing / remediating channelization, possibly through a remeandering and other restoration projects such as installing boulders, large rocks, and / or rootwads.</i>	2000	lf	1	\$0	\$0	\$0	\$0
1.1.5	Waukegan	Inspect and remediate culvert, which is nearly full of water in the inventory photo and may be sediment filled.	1	ea	1	\$0	\$0	\$0	\$0
1.1.6	Waukegan	Inspect and remediate culvert, which is nearly full of water in the inventory photo and may be sediment filled.	1	ea	1	\$0	\$0	\$0	\$0
3b.0.12	Waukegan	Address algae / nutrient loads by naturalizing the basin.		lf	1	\$2,500	\$250	\$0	\$0
3b.0.15	Waukegan	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
3b.0.16	Waukegan	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation.	400	lf	1	\$125	\$2	\$50,000	\$600
3b.16.5	Waukegan	<i>Stabilize the eroding, 4 foot deep cut channel within the turf grass landscape at the upstream end of BL16, just downstream of the Beach Rd. culvert.</i>	300	lf	2	\$100	\$2	\$60,000	\$900
3b.16.6	Waukegan	<i>Repair or replace the steel Beach Road culvert that is eroding around the edges and beneath, possibly due in part to the additional plastic drain pipe.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.0.3	Waukegan	For Waukegan Airport property, implement the spill prevention and response plan and reduce the use of salt and/or deicers. Install filtration and infiltration BMPs to capture and treat runoff from airport landscapes, particularly impervious surfaces such as runways and fueling areas, before being discharged to the stream system of Bull Creek.	A/R	-	-	-	-	-	-

Table J3 City of Waukegan Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.0.17	Waukegan	Retrofit as wet / wetland basin; plant banks and a surrounding buffer with native vegetation.	1300	lf	1	\$125	\$2	\$162,500	\$1,950
4.0.5	Waukegan	Improve swale and other surface stormwater drainage systems within the developed areas of the SMU, particularly those residential areas off Miraflores and Montesano, with lot level stormwater filtration and infiltration BMPs. Details reflect 28,000 lf (approximately 6.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.	7	acres	1	\$0	\$0	\$0	\$0
4.0.7	Waukegan	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
4.0.8	Waukegan	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
4.05.5	Waukegan	<i>Stabilize and strengthen the incised discharge channel.</i>	1	ea	1	\$0	\$0	\$0	\$0
5.0.1	Waukegan	Preserve the ravine within the 7-acre open Category 1 green infrastructure area between Circle Court and the Amstutz Expressway.	7	acre	1	\$0	\$0	\$0	\$0
5.0.2	Waukegan	Preserve and restore wetland complexes where these resource remain, including those along the entire length of reach BL04 and those adjacent to Lake County Gardens (depressional storage areas #22 and #23). Wetland / depressional area #23, bordered by Pine, Lorraine, Wilson, and the McClory Bike Trail, contains some elements of a decent quality wetland indicative of good restoration potential. Two additional potential restoration areas are the small park between Butrick and Yeoman and the upstream drainage corridor north of and paralleling Rice St.	65	acre	1	\$0	\$0	\$0	\$0
5.0.3	Waukegan	Preserve the wetlands / stream corridor within Category 1 and 2 open green infrastructure areas between Rice and MacArthur, west of Lewis Avenue, and the area between Pine, Wilson, and the McClory bike path.	34	acre	1	\$0	\$0	\$0	\$0
5.0.4	Waukegan	<i>Install filtration BMPs for commercial and institutional uses along Greenwood Avenue and at the York House Rd / Lewis Ave intersection to help reduce pollutant loading in potential pollution hotspot subbasins S13, S14, S43, and S73. Details reflect 10,000 lf (approximately 2.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on along the road frontage.</i>	3	acres	1	\$0	\$0	\$0	\$0
5.0.5	Waukegan	<i>Install lot level filtration and infiltration BMPs, to help reduce pollutant loading in potential pollution hotspot subbasins S13, S14, S39, S43, and S73. Details reflect 228,000 lf (approximately 52 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	52	acres	1	\$0	\$0	\$0	\$0

Table J3 City of Waukegan Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
5.0.6	Waukegan	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation.	1500	lf	1	\$125	\$2	\$187,500	\$2,250
5.0.7	Waukegan	Stabilize / regrade shoreline using bioengineering practices and plant banks and surrounding buffer with native vegetation; inspect and remediate inlet / outlet problems by removing clogging and/or debris buildup; address turbidity / sedimentation by naturalizing the basin; remove excess debris.	900	lf	1	\$125	\$2	\$112,500	\$1,350
5.0.8	Waukegan	Stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation.	600	lf	1	\$125	\$2	\$75,000	\$900
5.0.9	Waukegan	Retrofit as wet / wetland basin; stabilize / regrade shoreline using bioengineering practices and plant banks and surrounding buffer with native vegetation.	900	lf	1	\$125	\$2	\$112,500	\$1,350
5.0.10	Waukegan	<i>Retrofit as wet / wetland basin; stabilize / regrade shoreline using bioengineering practices and plant banks and a surrounding buffer with native vegetation; address algae / nutrient loads and address turbidity / sedimentation by naturalizing the basin. This may reduce pollutant loading within potential pollutant loading hotspot S39.</i>	750	lf	1	\$125	\$2	\$93,750	\$1,125
5.0.11	Waukegan	<i>Inventory detention basin and identify resolutions to any noted functional problems. This may reduce pollutant loading within potential pollutant loading hotspot S14.</i>	1	ea	1	\$0	\$0	\$0	\$0
5.2.1	Waukegan	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. Restoration and management of Bowen Park and the residential areas along Miraflores is important to enhance the habitat quality of this reach.	4000	lf	2	\$0	\$0	\$0	\$0
5.2.2	Waukegan	Reduce impacts of surrounding golf course and park property such as landscape waste dumping, turf grass stream edges. Filter and infiltrate runoff from parking lots, such as those within Bowen Park, with BMPs. Details reflect installation of lot level BMPs.	2000	lf	2	\$0	\$0	\$0	\$0
5.2.3	Waukegan	Reduce impacts of residential homes along Miraflores: cease yard waste dumping, replace mown turf grass to the edge of the stream with a minimum 10 foot native vegetation buffer, infiltrate runoff discharge from roof or footing drains with rain gardens or rain barrels, and naturalize the stream channel by replacing poured concrete and rip rap with bioengineering stabilization measures.	2000	lf	2	\$0	\$0	\$0	\$0
5.2.4	Waukegan	Gully erosion occurring in the ravines of Bowen Park should be remediated through ravine woodland restoration and management along reach BL02. Assumes 4000 lf of stream reach by 500' width. Costs reflect woodland restoration; load reduction reflects Moderate erosion stabilization. 46		acre	1	\$0	\$0	\$0	\$0

Table J3 City of Waukegan Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
5.2.5	Waukegan	Stabilize erosion around the Sheridan Road culvert and replace the broken stormsewer that is discharging to the opposite streambank.	1	ea	1	\$0	\$0	\$0	\$0
5.2.6	Waukegan	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
5.2.7	Waukegan	Remove debris obstructing flow using American Fisheries Society guidelines.	1	ea	1	\$0	\$0	\$0	\$0
5.2.8	Waukegan	Stabilize typical 2-4 foot bank erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.	100	lf	1	\$50	\$2	\$5,000	\$150
5.2.9	Waukegan	Stabilize minor erosion of open discharge channel using bioengineering stabilization measures.	1	ea	1	\$0	\$0	\$0	\$0
5.2.10	Waukegan	Stabilize significant erosion below outfall using bioengineering stabilization measures.	1	ea	1	\$0	\$0	\$0	\$0
5.2.11	Waukegan	Stabilize minor channel erosion below concrete lined channel outfall. Consider removing concrete and stabilizing channel with more habitat-appropriate measures.	1	ea	1	\$0	\$0	\$0	\$0
5.2.12	Waukegan	Install energy dissipation measures to address the eroding plunge pool created by discharge from the elevated outfall.	1	ea	1	\$0	\$0	\$0	\$0
5.3.1	Waukegan	<i>Restore a 5 foot wide native riparian buffer and replace turf grass lawn edges to native riparian plant communities as is feasible within the golf course.</i>	3000	lf	2	\$0	\$0	\$0	\$0
5.3.2	Waukegan	Glen Flora Country Club: replace or remediate online detention, armored dams and wiers with more habitat appropriate structures that allow fish passage. 3		ea	1	\$0	\$0	\$0	\$0
5.3.3	Waukegan	<i>Stabilize erosion undercutting the concrete-lined channel outfall / dam; if feasible, remove concrete and replace with bioengineered channel stabilization measure.</i>	20	lf	1	\$0	\$0	\$0	\$0
5.4.1	Waukegan	Restore stream channel and improve instream habitat by reducing channelization, such as through a remeandering project.	7000	lf	1	\$0	\$0	\$0	\$0
5.4.2	Waukegan	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, and managing vegetation such as through prescribed burning.	7000	lf	2	\$0	\$0	\$0	\$0

Table J3 City of Waukegan Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
5.4.3	Waukegan	Implement the mitigation plan for FPAI site 20-06, in the City of Waukegan, Lake County Gardens subdivision. There also may be opportunities to increase the detention and/or drainage capacity of the drainage system in this area, particularly within the community park to the north. However, improvement of the wetlands to increase their storage capacity may also be an option.	145	acres	1	NA	NA	NA	NA
5.4.4	Waukegan	Restore the upper end of this reach, a fairly undefined channel that is choked with cattails, through invasive species removal and management.	2200	lf	1	\$0	\$0	\$0	\$0
6.0.1	Waukegan	<i>Manage and restore the wooded ravine, wetland, and depressional area #3 that lies between the Amstutz and Sheridan Road for storage. Load reduction details reflect impact of restored wetland.</i>	14	acre	1	\$0	\$0	\$0	\$0
6.0.3	Waukegan	Open and partially open Category 1 green infrastructure areas between the waste water treatment plant and the Union Pacific tracks should be restored and integrated into the planned Waukegan Moorlands area to the north. Details reflect natural area restoration.	28	acre	1	\$0	\$0	\$0	\$0
6.0.4	Waukegan	<i>Install filtration BMPs for commercial, industrial, and institutional uses in the eastern and southwestern portions of the SMU to help improve water quality in potential pollutant loading hotspot S10, S11, and S75. Details reflect approximately 15,000 lf (approximately 3.5 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on along the road frontages of these land uses.</i>	4	acre	1	\$0	\$0	\$0	\$0
6.0.5	Waukegan	<i>This SMU is primarily sewer but undetained. Install source controls and lot level filtration and infiltration BMPs, including detention basin improvements, which may help address pollutant loading in potential pollutant loading hotspot S10, S11, and S75. Details reflect 96,000 lf (approximately 22 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	22	acre	1	\$0	\$0	\$0	\$0

Table J4 Illinois Department of Natural Resources Plan Implementation Cost Estimate

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
1.0.2	IDNR	Develop and implement habitat restoration and management plans for Illinois Beach State Park, including all wetlands, waterways, beach ridge, dune and swale systems, and T&E species habitat. 1548		acres	1	\$0	\$0	\$0	\$0
1.0.5	IDNR	Restore hydrologic connectivity of Dead River to Lake Michigan and remove those created to carry wastewater to the lake. Assumes that 4 hydrologic connections need to be restored or removed.	4	ea	1	NA	NA	NA	NA
1.0.16	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
1.0.17	IDNR	Stabilize / regrade shoreline using bioengineering practices and address algae / nutrient loads by naturalizing the basin.	1100	lf	1	\$125	\$2	\$137,500	\$1,094
1.0.18	IDNR	Address algae / nutrient loads by naturalizing the basin.	1	ea	1	\$2,500	\$250	\$2,500	\$250
1.0.19	IDNR	Address algae / nutrient loads by naturalizing the basin.	1	ea	1	\$2,500	\$250	\$2,500	\$250
1.0.20	IDNR	Address algae / nutrient loads by naturalizing the basin.	1	ea	1	\$2,500	\$250	\$2,500	\$250
1.0.21	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
1.0.22	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
1.0.25	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0
1.0.26	IDNR	Inventory detention basin and identify resolutions to any noted functional problems.	1	ea	1	\$0	\$0	\$0	\$0

Table J5 Lake County Plan Implementation Cost Estimate

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3a.0.6	Lake County	Depressional storage area #78, within the Thunderhawk Golf Club Forest Preserve, may be able to be expanded to provide additional storage if needed, and may also be retrofitted / restored to improve runoff quality from the golf course, provided that runoff can be directed into this area, treated, and then discharged to a receiving water body. Costs reflect restoration of this wet / hydric area. 5		acre	1	\$0	\$0	\$0	\$0
3a.0.18	Lake County	Stabilize / regrade shoreline using bioengineering practices; address algae / nutrient loads by naturalizing the basin.	1200	lf	1	\$125	\$2	\$150,000	\$1,800
3c.0.11	Lake County	Stabilize / regrade shoreline using bioengineering practices; address algae / nutrient loads by naturalizing the basin.	1000	lf	1	\$125	\$2	\$125,000	\$1,500
3c.0.12	Lake County	Stabilize / regrade shoreline using bioengineering practices.	2000	lf	1	\$125	\$2	\$250,000	\$3,000
3c.0.13	Lake County	Stabilize / regrade shoreline using bioengineering practices; address algae / nutrient loads by naturalizing the basin.	650	lf	1	\$125	\$2	\$81,250	\$975
3c.23.1	Lake County	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	3600	lf	2	\$0	\$0	\$0	\$0
4.0.3	Lake County	Manage and restore the natural resources, including ADID wetland #1831, in the northeastern corner of Lyons Woods Forest Preserve. The southern portion of depressional storage area #28 is within the Forest Preserve boundary and may be used to relieve past IDOT-recorded flooding at Sheridan and York House Road. ADID wetland is approximately 46 acres (4000' by 500' wide) and the total area of Lyons Woods is 264 acres.	264	acres	1	\$0	\$0	\$0	\$0

Table J6 Multiple Jurisdictions Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
1.0.4	Waukegan, IDNR, Lake County	Remediate, cap, or otherwise contain contaminated areas, materials, waste piles, waste ponds, etc. to prevent contaminants from becoming mobilized (via air or water) and entering water resources or sensitive natural areas in Illinois Beach State Park.	A/R	-	-	-	-	-	-
1.0.6	Beach Park, Waukegan	Preserve Category 1 open green infrastructure areas including a portion of depressional storage area #17 and the utility corridor that can serve as a green infrastructure connector between Illinois Beach State Park to Lyons Woods Forest Preserve.	30	acres	1	\$0	\$0	\$0	\$0
1.0.11	Zion, Waukegan, IDNR	Manage the Lake Michigan shoreline and beaches to minimize beach erosion. Details reflect 28000 lf of shoreline at an average width of 150 feet.	96	acres	1	\$0	\$0	\$0	\$0
1.0.12	Zion, Waukegan, IDNR	Manage the Lake Michigan shoreline and beaches to minimize E. coli contamination that leads to beach closures. Details reflect 28000 lf of shoreline at an average width of 150 feet.	96	acres	1	\$0	\$0	\$0	\$0
1.0.13	Zion, Beach Park, Waukegan, IDNR	<i>Install drainage swale improvements or other lot level / source control BMPs to capture and treat runoff from commercial and industrial land uses within Critical Subbasins #15, #74, and #76, identified as potential Pollution Hot Spot Critical Areas. Cost estimate reflects the installation of swales (10' wide) or other treatment measures along perimeter of these land uses, approximately 35,000 lf of treatment area.</i>	8	acres	1	\$0	\$0	\$0	\$0
1.1.2	Waukegan, IDNR, Lake County	<i>Restore the natural connection and habitat quality of this reach to Lake Michigan by removing the lagoons through which the reach runs and disconnecting the reach from the Dead River to the north. Since these lagoons may be a component of a remediation or clean up plan, this should be considered a long term recommendation to be implemented when the contamination issues at Johns Manville have been adequately remediated. Details reflect major channel restoration.</i>	2000	lf	2	\$0	\$0	\$0	\$0
1.1.4	Waukegan, Lake County	Address potential hazardous / toxic runoff from industrial uses to the east through filter strips and other filtration and infiltration techniques installed between the reach and these land uses, or by containing and remediating runoff on site through other means. Cost estimate reflects the installation of 2000 lf of 20' wide infiltration and filtration BMPs.	0	acre	1	\$0	\$0	\$0	\$0
1.6.1	Beach Park, Lake County	Restore stream channel and improve instream habitat by installing pools and riffles and installing boulders, large rocks, and / or rootwads.	2000	lf	1	\$0	\$0	\$0	\$0
1.6.2	Beach Park, Lake County	Restore native riparian buffer by controlling invasive species, planting native species, thinning forest and shrub canopy, and managing vegetation such as through prescribed burning.	2000	lf	2	\$0	\$0	\$0	\$0

Table J6 Multiple Jurisdictions Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
2.0.1	Zionion Beach Park	Category 1 and 2 green infrastructure areas along the western boundary of Illinois Beach State Park and bordering the Union Pacific rails to the west should be preserved as components of the green infrastructure / greenway system that includes Ophir Park, Carmel Park, and Illinois Beach State Park. These areas contain significant low lying depressional storage areas (#55, #56, and #57) that could be used for water quality improvement, wetland / hydric soil complexes, and steep slopes that are unsuitable for development.	61	acres	1	\$0	\$0	\$0	\$0
2.0.2	Zion, Beach Park	<i>Convert the depressional storage complex of #55, #56, and #57 to improve water quality for Critical Subbasin #2, identified as a potential Pollutant Loading Hotspot. Assumes runoff can be directed into this area, treated, and discharged to the Illinois Beach State Park stream and wetland system. Estimated area to be converted is 7000lf by 400ft wide.</i>	64	acres	1	\$0	\$0	\$0	\$0
2.0.4	Zion, Beach Park	<i>Reduce pollutant loading to Critical Subbasin #2, a potential pollutant loading hotspot, by improving swales and other surface stormwater drainage systems and installing stormwater filtration and infiltration BMPs to capture and treat runoff from parking lots, utilities, rooftops, storage areas, and other areas that may contribute pollutants to the stream. Cost estimate assumes 130,000 lf (approximately 30 acres) of 10 foot wide drainage swale improvements as a proxy for on-site source control BMPs.</i>	30	acre	1	\$0	\$0	\$0	\$0
3a.0.1	Zion, Beach Park	Manage and restore the wooded ravine along reaches BL25, BL26, and BL27. Average 5000' x 250' wide.	29	acre	1	\$0	\$0	\$0	\$0
3a.0.2	Zion, Beach Park	Preserve and restore wetlands along drainage channel upstream of the McClory Bike Path and the complex northwest of Lewis and 29th St., wetland #4 east of Lewis Avenue, and wetland #3 in Hermon Park (56 acres total). Regional storage area #77 and the associated wetlands (9 acres) could be restored and / or used to provide storage for this SMU if needed when the upstream area develops. Implementation details reflect wetland / hydric soils preservation and restoration.	65	acre	1	\$0	\$0	\$0	\$0
3a.0.4	Zion, Beach Park	Preserve and restore T&E habitat within the area bounded by Lebanon St., the McClory Bike Path, and 31st St.	6	acre	1	\$0	\$0	\$0	\$0
3a.0.5	Zion, Beach Park	<i>Improve any swale and other surface stormwater drainage systems and/or install source controls and lot level stormwater filtration and infiltration BMPs within the developed areas of the SMU. These practices may help reduce pollutant loading in potential pollution hotspot subbasins S1, S3, S4, and S48. In order to generate cost and pollutant load reduction estimates, road swales are used as a proxy for individual site BMPs. Details reflect 252,000 lf (approximately 58 acre) of 10 foot wide drainage swale improvements on both side of all roads.</i>	61	acre	1	\$0	\$0	\$0	\$0

Table J6 Multiple Jurisdictions Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3a.25.1	Zion, Beach Park	<i>Address Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	2000	lf	2	\$50	\$2	\$200,000	\$6,000
3a.25.2	Zion, Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning. A wider, partially forested buffer is appropriate in the lower parts of the reach.	2000	lf	2	\$0	\$0	\$0	\$0
3a.25.3	Zion, Beach Park	Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.	2000	lf	2	\$0	\$0	\$0	\$0
3a.25.5	Zion, Beach Park	Inspect hydraulic structure for possible erosion problems and stabilize using bioengineering practices if needed.	1	ea	1	\$0	\$0	\$0	\$0
3a.27st.1	Zion, Beach Park	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	4000	lf	2	\$0	\$0	\$0	\$0
3b.0.1	Beach Park, Waukegan	Preserve and restore wetlands where these resource remain along drainage channel BL15, BL16, BL17, and along the daylight portions of the Wilson Avenue Tributary. Area is 10,000 lf by 300' wide. 69		acre	1	\$0	\$0	\$0	\$0
3b.0.4	Beach Park, Waukegan	<i>Preserve greenway easements on Category 1 and 2 green infrastructure areas along BL16, which may help reduce pollution loading in potential pollution hotspot S57. Cost estimate assumes easements of 2000 lf by 100 ft wide (4.5 acres).</i>	5	acres	1	\$0	\$0	\$0	\$0
3b.0.6	Beach Park, Waukegan	<i>Depressional storage areas #32 and #43, currently undeveloped and containing current or former wetlands, could be enhanced to improve water quality of runoff from surrounding residential uses within this Critical Subbasin #57, identified as a potential pollutant loading hotspot. Depressional area #43 lies in an open Category 1 green infrastructure area that could be preserved for water quality improvement. Details reflect restoration and enhancement of both areas as wetlands.</i>	13	acres	1	\$0	\$0	\$0	\$0
3b.0.7	Beach Park, Waukegan	<i>Improve swales and other surface stormwater drainage systems and install source controls and lot level BMPs, including detention basin improvements, within the developed areas of potential pollutant loadin hotspots S57, S59, and S63. Details reflect 165,000 lf (approximately acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	38	acres	1	\$0	\$0	\$0	\$0

Table J6 Multiple Jurisdictions Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3b.15.1	Beach Park, Waukegan	Restore stream channel and improve instream habitat by enhancing pools and riffles.	2800	lf	1	\$0	\$0	\$0	\$0
3b.15.2	Beach Park, Waukegan	<i>Address High streambank erosion along entire reach using bioengineering stabilization measures.</i>	2800	lf	2	\$100	\$2	\$560,000	\$8,400
3b.15.3	Beach Park, Waukegan	Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.	2800	lf	2	\$0	\$0	\$0	\$0
3b.15.4	Beach Park, Waukegan	Inspect footbridges and armored / concrete-lined banks for impacts on the stream corridor and remediated if necessary.	1	ea	1	\$0	\$0	\$0	\$0
3b.15.5	Beach Park, Waukegan	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	2800	lf	2	\$0	\$0	\$0	\$0
3b.15.6	Beach Park, Waukegan	Inspect and, if necessary, repair the culvert under the McClory Bike Trail, which is partially collapsed. 1		ea	1	\$0	\$0	\$0	\$0
3b.15.7	Beach Park, Waukegan	<i>Remove debris obstructing flow using American Fisheries Society guidelines.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.15.8	Beach Park, Waukegan	<i>Stabilize typical 4-6 foot bank erosion using bioengineering stabilization measures. Length difficult to determine from photo; assume 100 lf and 1 side of stream for cost estimation purposes.</i>	100	lf	1	\$100	\$2	\$10,000	\$150
3b.15.9	Beach Park, Waukegan	<i>Stabilize erosion of the Beach Road steel culvert experiencing erosion around and underneath using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.15.13	Beach Park, Waukegan	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.15.14	Beach Park, Waukegan	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.15.15	Beach Park, Waukegan	<i>Stabilize erosion around clay drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.16.1	Beach Park, Waukegan	<i>Restore stream channel and improve instream habitat by enhancing pools and riffles and installing boulders, large rocks, and / or rootwads.</i>	3500	lf	1	\$0	\$0	\$0	\$0

Table J6 Multiple Jurisdictions Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in <i>italics</i>)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3b.16.2	Beach Park, Waukegan	<i>Address Moderate streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the instream silt / sedimentation load.</i>	3500	lf	2	\$50	\$2	\$350,000	\$10,500
3b.16.3	Beach Park, Waukegan	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	3500	lf	2	\$0	\$0	\$0	\$0
3b.16.4	Beach Park, Waukegan	<i>Install residential lot level stormwater BMPs, such as rain barrels or rain gardens, to reduce runoff discharge from roof or footing drains.</i>	3500	lf	2	\$0	\$0	\$0	\$0
3b.15.16	Beach Park, Waukegan	<i>Stabilize erosion around two plastic drain pipe outfalls using bioengineering stabilization measures.</i>	2	ea	1	\$0	\$0	\$0	\$0
3b.15.17	Beach Park, Waukegan	<i>Stabilize erosion around concrete drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
3b.18.1	Beach Park, Waukegan	<i>BL18 flows through and near several publicly owned, open and partially open areas on or adjacent to the Waukegan Regional Airport property southwest of the Wadsworth Rd / Lewis Ave intersection. These areas include depressional storage area #34, which could be expanded and enhanced for stormwater storage and to capture and cleanse water runoff from airport property, which lies in Critical Subbasin #69, a potential pollutant loading hotspot.</i>	7	acres	1	\$0	\$0	\$0	\$0
3b.18.2	Beach Park, Waukegan	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	700	lf	2	\$50	\$2	\$70,000	\$2,100
3b.18.3	Beach Park, Waukegan	<i>The culvert draining Waukegan Airport is covered with wire fencing, presumably for security or to prevent animal invasion. However, investigate source and necessity, and remove if fencing impedes flow. It appears that strong flows exit the Airport property in this location.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.0.2	Beach Park, Zion	<i>Manage and restore the wooded ravine along reaches BL07, BL08, BL09, BL10, BL11, BL19, BL20, BL21. Assumes 18,600 lf of stream by average 250' wide.</i>	107	acres	1	\$0	\$0	\$0	\$0
3c.0.4	Beach Park, Zion	<i>Preserve and restore wetlands along drainage channels BL21, BL22, BL23, BL24. Assumes 10,300 lf by 350' wide.</i>	83	acres	1	\$0	\$0	\$0	\$0

Table J6 Multiple Jurisdictions Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.0.5	Beach Park, Zion	Preserve Category 1 green infrastructure area bounded by the McClory Bike Path, Clover, Wadsworth, and 34th St. that borders the stream channel to the north. Also preserve three separate areas through which the stream corridor runs: one along BL07 within the ravine, the second at the confluence of BL08, BL09, and BL19, and the third just upstream of this confluence along BL09.	11	acres	1	\$0	\$0	\$0	\$0
3c.0.6	Beach Park, Zion, Waukegan	<i>Install filtration BMPs for commercial, industrial, and institutional uses along Sheridan Road, Wadsworth, and Lewis Avenue, which will help reduce pollutant loading in potential pollution hotspot subbasin #64. Details reflect 12,000 lf of road frontage along these uses to be treated with improved, 10' swales (approximately 2.75 acres.)</i>	3	acres	1	\$0	\$0	\$0	\$0
3c.0.7	Beach Park, Zion, Waukegan	<i>Install lot level filtration and infiltration BMPs within potential pollution hotspot subbasin #64. Details reflect 208,000 lf (approximately 48 acre) of 10 foot wide drainage swale improvements / lot level / source control BMPs on each side of all roads.</i>	48	acres	1	\$0	\$0	\$0	\$0
3c.0.8	Beach Park, IDNR	Preserve the Category 1 open green infrastructure area that contains depressional storage area #45 along the west side of the Union Pacific rails.	5	acres	1	\$0	\$0	\$0	\$0
3c.7.1	Beach Park, IDNR	<i>Stabilize High streambank erosion along approximately 25% of this reach not included in the previous stabilization project, some threatening homes and property, using bioengineering stabilization measures.</i>	500	lf	2	\$100	\$2	\$100,000	\$1,500
3c.7.2	Beach Park, IDNR	<i>Manage native riparian plant communities within this reach: control invasive species, plant native species, and manage vegetation such as through prescribed burning.</i>	1800	lf	2	\$0	\$0	\$0	\$0
3c.21.1	Beach Park, Zion	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures.</i>	3500	lf	2	\$50	\$2	\$350,000	\$10,500
3c.21.2	Beach Park, Zion	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	3500	lf	2	\$0	\$0	\$0	\$0
3c.21.3	Beach Park, Zion	<i>Repair the discharge point / failed headwall approximately 200' upstream of the McClory Bike Path.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.21.4	Beach Park, Zion	<i>Stabilize channel erosion at outfall, and consider replacing rip rap control measure with bioengineering stabilization practices.</i>	1	ea	1	\$0	\$0	\$0	\$0
3c.21.5	Beach Park, Zion	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0

Table J6 Multiple Jurisdictions Plan Implementation Cost Estimate (continued)

ID# (SMU.reach.ID)	Jurisdiction	Recommendation Description (those addressing critical areas in italics)	Quantity	Unit	# of sides	Initial Unit Cost (\$)	Annual Unit Cost (\$)	Estimated Total Initial Cost (\$)	Estimated Total Annual Cost (\$)
3c.21.6	Beach Park, Zion	<i>Stabilize erosion around plastic drain pipe outfall using bioengineering stabilization measures.</i>	1	ea	1	\$0	\$0	\$0	\$0
4.0.2	Waukegan, Beach Park	Manage and restore the woodland ravine along reach BL05. Assumes 5000' by 500' area for cost estimation purposes.	58	acre	1	\$0	\$0	\$0	\$0
4.0.4	Waukegan, Beach Park	Preserve and restore the wetland complex within the open, Category 1 green infrastructure area along the eastern boundary of SMU 4 west of the Union Pacific rail line. This area creates a physical land connection between Lyons Woods and Illinois Beach State Park, and would also preserve regional storage area #17.	37	acres	1	\$0	\$0	\$0	\$0
4.05.1	Waukegan, Beach Park	<i>Stabilize Moderate streambank erosion along entire reach using bioengineering stabilization measures, which may help reduce the silt / sediment accumulation.</i>	3000	lf	2	\$50	\$2	\$300,000	\$9,000
4.05.2	Waukegan, Beach Park	<i>Restore and manage the native riparian buffer plant communities along this reach by controlling invasive species, planting native species, thinning forest and shrub vegetation to allow more ground vegetation, and managing vegetation such as through prescribed burning.</i>	3000	lf	2	\$0	\$0	\$0	\$0
6.0.2	Waukegan, IDNR, Lake County	<i>Remediate, cap, or otherwise contain contaminated areas, materials, waste piles, waste ponds, etc. to prevent contaminants from becoming mobilized (via air or water) and entering water resources or sensitive natural areas in Illinois Beach State Park. This may help address potential pollutant loading hotspot S75</i>	A/R	-	-	-	-	-	-

appendix J - implementation plan cost estimate

Table J7 Unit Cost information for Dead River Watershed Management Plan

Category	Action Recommendations	Details	Initial Cost	Annual Cost	Unit	Admin / Tech Support	Comment
Natural Resource Restoration and Management	Wooded bank burn management		\$10	\$1.50	lf	M	
	Initial clearing and herbiciding (2-year cycle)						
	Assume 30 feet on each side of stream						
	Annual fre ~ 30 ft buffer (0.0007 ac/ft)						
	Woodland management		\$8,000	\$1,700.00	acre	M	
	Initial clearing and herbiciding (2-year cycle)						
	Annual burning						
	Wetland Management and Restoration		\$5,000	\$200.00	acre	M	
	Invasive species control						
	Natural Area Management and Restoration		\$7,500	\$1,700.00	acre	M	
	Clearing and burning						
	Lake / Pond / Shoreline Management and Restoration		\$2,500	\$500	acre	M	
Native Riparian Buffers	Establish, restore, and manage native riparian buffer		\$25	\$1.50	lf	L	
	Initial clearing and herbiciding (2-year cycle)						
	Seeding and plugging						
	Annual fre ~ 30 ft buffer (0.0007 ac/ft)						
	Riparian buffer management		\$7	\$1.50	lf	L	

Table J7 Unit Cost information for Kellogg Creek and Dead River Watershed Management Plan (continued)

Category	Action Recommendations	Details	Initial Cost	Annual Cost	Unit	Admin / Tech Support	Comment
Category	Action Recommendations	Details	Initial Cost	Annual Cost	Unit	Admin / Tech Support	Comment
Natural Resource Restoration and Management	Wooded bank burn management		\$10	\$1.50	lf	M	
	Initial clearing and herbiciding (2-year cycle)						
	Assume 30 feet on each side of stream						
	Annual fire ~ 30 ft buffer (0.0007 ac/ft)						
	Woodland management		\$8,000	\$1,700.00	acre	M	
	Initial clearing and herbiciding (2-year cycle)						
	Annual burning						
	Wetland Management and Restoration		\$5,000	\$200.00	acre	M	
	Invasive species control						
	Natural Area Management and Restoration		\$7,500	\$1,700.00	acre	M	
	Clearing and burning						
	Lake / Pond / Shoreline Management and Restoration		\$2,500	\$500	acre	M	
Native Riparian Buffers	Establish, restore, and manage native riparian buffer		\$25	\$1.50	lf	L	
	Initial clearing and herbiciding (2-year cycle)						
	Seeding and plugging						
	Annual fire ~ 30 ft buffer (0.0007 ac/ft)						
	Riparian buffer management		\$7	\$1.50	lf	L	
	Native buffer (5' width) within lawns / golf courses along shoreline		\$1	\$0.10	lf	L	

appendix J - implementation plan cost estimate

Table J7 Unit Cost information for Kellogg Creek and Dead River Watershed Management Plan (continued)

Category	Action Recommendations	Details	Initial Cost	Annual Cost	Unit	Admin / Tech Support	Comment
Streambank Stabilization	Minor regrading (assumes 2' high bank)		\$40	\$1.50	lf	H	
	Regrading, seed, blanket						
	Annual f re ~ 30 ft buffer (0.0007 ac/ft)						
	Detention Basin Retrof ts					H	
	Create wet / wetland basin		NA	NA	ft cu		
	Stabilize / regrade shoreline		\$100	\$1.50	lf		
	Plant banks / buffer with native vegetation		\$25	\$1.50	lf		
	Inlet / outlet remediation		NA	NA	ea		
	Algae control		\$2,500	\$250.00	ea		
	Turbidity control		NA	NA	ft cu		
	Debris removal		NA	NA	ea		
Green Infrastructure Protection	Protect Green Infrastructure Parcels		\$10,000	\$500	acre	M	
	purchase / easement						
	Conversion of depressional areas to storage and water quality enhancement		\$3,500	\$500	acre	H	
Discharge Point Remediation	Point Discharge Erosion / Stabilization		\$3,000	\$500	ea	M	
	Assumes 20lf of severe streambank erosion						
	Point Discharge Repair (major headwall or pipe failure)		\$6,000	\$500	ea	H	
	Plastic Drain Remediation (redirection, BMP installation, f ow attenuation)		\$1,000	\$150	ea	L	

Table J7 Unit Cost information for Kellogg Creek and Dead River Watershed Management Plan (continued)

Category	Action Recommendations	Details	Initial Cost	Annual Cost	Unit	Admin / Tech Support	Comment
Culvert Remediation	Culvert Repair / Stabilization		\$5,000	\$0	ea	H	
Debris & Sediment Removal	Sediment / debris removal from culvert / outfall (annual cost reflects single inspection per year)		\$450	\$50	ea	M	
	Sediment removal from channel		\$20	\$0	lf	M	
	Debris removal / clean up (annual monitoring)		\$1,500	\$50	ea	L	
Monitoring	Annual monitoring / inspection, single stream point		\$125	\$75	ea	L	
	Annual monitoring inspection, reach		\$750	\$600	ea	L	
	Inspect / inventory detention basin		\$350	\$0	ea	L	
Administrative / Planning						M	

appendix J - implementation plan cost estimate