



# Indian Springs Metropark Stormwater Management Plan

September 2019



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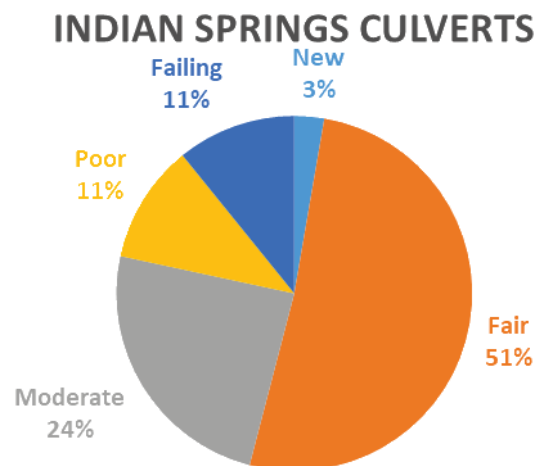
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## Indian Springs Metropark Stormwater Structure Recommendations

**Table 1.** Summary of Indian Springs Culvert Inspection and Maintenance Needs

Culvert Rating	Number of Culverts	Culverts Needing Immediate Cleanout	Culverts Needing Future Cleanout	Culverts Needing Replacement or Repair
New	1	0	0	0
Fair	19	1	1	0
Moderate	9	1	1	0
Poor	4	0	1*	4
Failing	4	3*	1*	4
<b>Total:</b>	37	5*	4*	8
<b>Repair Cost:</b>		<b>\$154</b>	<b>\$2,824</b>	<b>\$29,897</b>

*\*Culvert may be replaced before it can be cleaned out.*



*Left: Failing culvert in Indian Springs Metropark. Right: Proportion of culverts in each condition category.*

**Table 2.** Individual Culvert Replacement Costs

Culvert ID	Diameter (in)	Length (ft)	Condition	Maintenance Need	Cost Opinion
<b>CUL-IND-002</b>	40	9	Moderate	Immediate Cleanout	\$84
<b>CUL-IND-005</b>	66	12	Moderate	Future Cleanout	\$396
<b>CUL-IND-015*</b>	6	16	Failing	Replacement	\$1,602
<b>CUL-IND-016*</b>	6	25	Failing	Replacement	\$2,467
<b>CUL-IND-018*</b>	6	15	Failing	Replacement	\$1,474
<b>CUL-IND-019*</b>	6	35	Failing	Replacement	\$3,519
<b>CUL-IND-020</b>	15	20	Fair	Future Cleanout	\$69
<b>CUL-IND-022</b>	12	31	Poor	Replacement	\$3,817
<b>CUL-IND-029*</b>	12	21	Poor	Replacement	\$2,592
<b>CUL-IND-033</b>	60	97	Fair	Future Cleanout	\$2,428
<b>CUL-IND-034</b>	12	74	Poor	Replacement	\$9,306
<b>CUL-IND-036</b>	60	9	Poor	Replacement	\$5,120
<b>Total:</b>					<b>\$32,874</b>

*\*Culvert may be replaced before it needs to be cleaned out.*

**Table 3.** Individual Stormwater Gravity Main Replacement Costs

Stormwater Gravity Main ID	Diameter (in)	Length (ft)	Maintenance Need	Cost Opinion
<b>STG-IND-0018^</b>	6	88	Partial Replacement, Re-inspection	\$29,339
<b>STG-IND-0020^</b>	15	5	Re-inspection	\$8
<b>Total:</b>				<b>\$29,347</b>

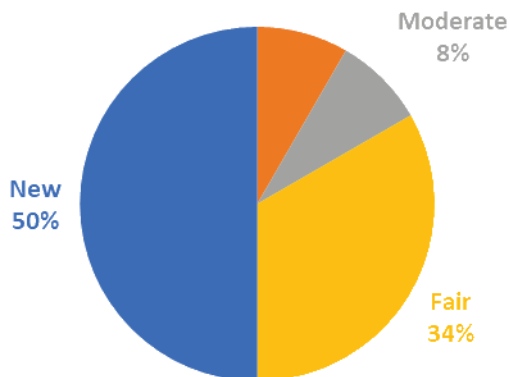
*^Televised*

Table 4. Summary of Indian Springs Outfall Inspection and Maintenance Needs

Outfall Rating	Number of Outfalls	Outfalls Needing Immediate Cleanout	Outfalls Needing Future Cleanout	Outfalls Needing Replacement or Repair
New	6	0	0	0
Fair	4	0	0	0
Good	1	0	0	0
Poor	1	0	1*	1
Failing	0	0	0	0
<b>Total:</b>	12	0	1*	1
<b>Repair Cost:</b>		<b>\$0</b>	<b>\$0</b>	<b>\$5,000</b>

\*Outfall may be replaced before it needs to be cleaned out.

### INDIAN SPRINGS OUTFALLS



Left: Proportion of outfalls in each condition category. Right: Outfall in poor condition in Indian Springs Metropark.

Table 5. Individual Outfall Replacement Costs

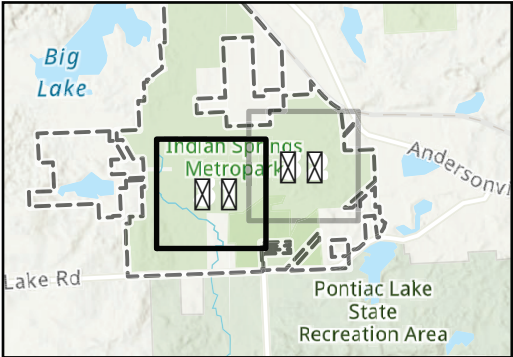
Outfall ID	Diameter (in)	Condition	Maintenance Need	Cost Opinion
SDC-IND-009*	8	Poor	Replacement	\$5,000
<b>Total:</b>				<b>\$5,000</b>

\*Outfall may be replaced before it needs to be cleaned out.

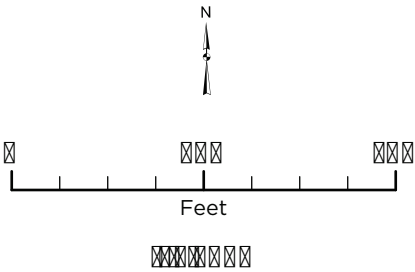
# Stormwater Structure Ratings

Indian Springs

Map Sheet: 31 of 48



Outfalls (Field Rating)	Gravity Main (Pipe Rating Index)
<div>Failing</div>	<div>1</div>
<div>Poor</div>	<div>2</div>
<div>Moderate</div>	<div>3</div>
<div>Fair</div>	<div>4</div>
<div>New</div>	<div>5</div>
	<div>Gravity Main (Other)</div>
	<div>Culvert (Other)</div>
Culverts (Field Rating)	Roads
<div>Failing</div>	<div>Roads</div>
<div>Poor</div>	<div>Park Boundary</div>
<div>Moderate</div>	
<div>Fair</div>	
<div>New</div>	
<div>(Not Rated)</div>	



Source: Data provided by Huron-Clinton Metroparks, State of Michigan, OHM Advisors, NearMap and ESRI. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl.

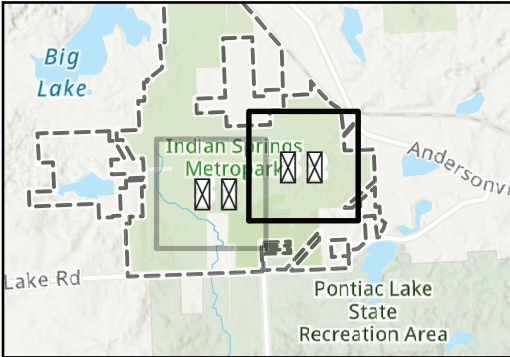
Map Published: October 23, 2019



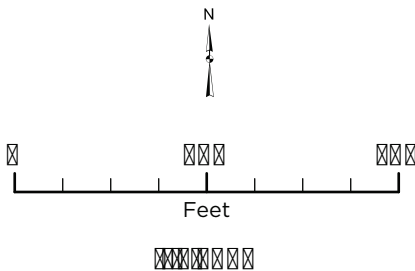
# Stormwater Structure Ratings

Indian Springs

Map Sheet: 32 of 48



Outfalls (Field Rating)	Gravity Main (Pipe Rating Index)
Failing	1
Poor	2
Moderate	3
Fair	4
New	5
	Gravity Main (Other)
Culverts (Field Rating)	Roads
Failing	Roads
Poor	Park Boundary
Moderate	
Fair	
New	
(Not Rated)	



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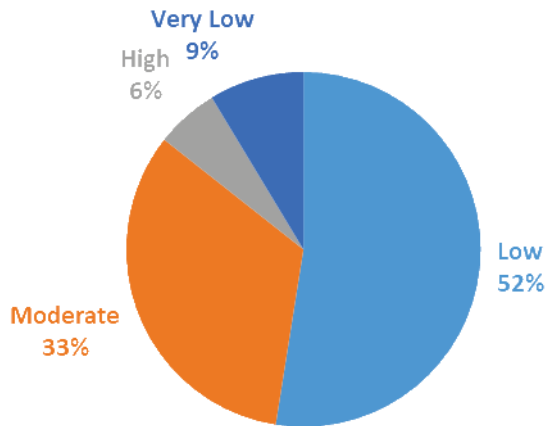
Map Published: October 23, 2019

## Indian Springs Metropark Streambank Summary and Recommendations

Table 6. Indian Springs Erosion Severity Summary

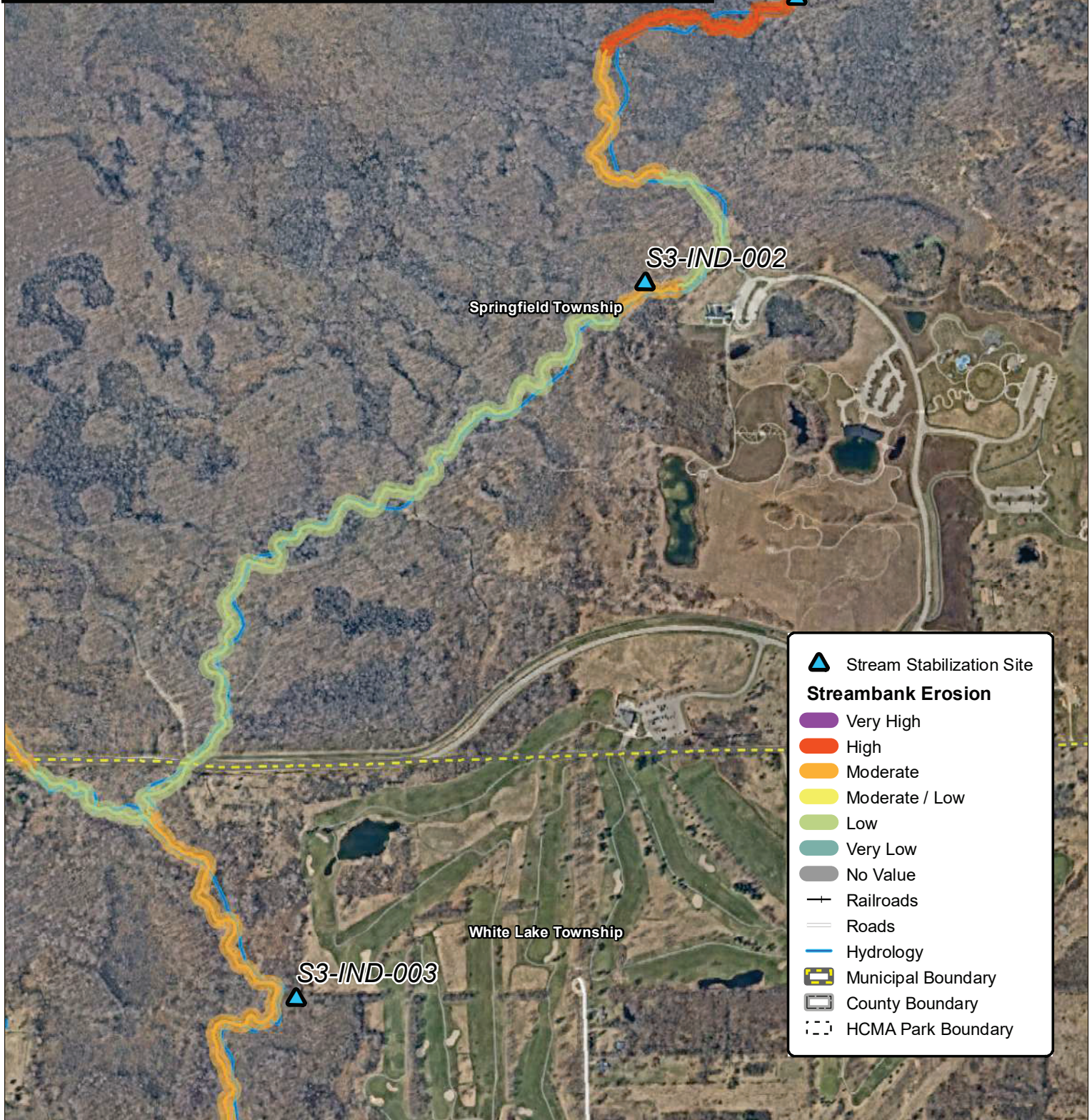
Erosion Condition	Feet of Streambank (miles)	Cost of Restoration
Very High	0.0 (0.0)	
High	2,059 (0.39)	\$355,000
Moderate	11,912 (2.26)	\$608,000
Low	18,892 (3.58)	
Very Low	3,115 (0.59)	
<b>Total:</b>	<b>35,977 (6.81)</b>	<b>\$963,000</b>

### INDIAN SPRINGS EROSION SEVERITY



Left: Proportion of stream in each erosion severity category. Right: Moderate erosion on a stream in Indian Springs Metropark.

Indian Springs Metropark - Recommended Streambank Stabilization					
Site	Length, ft	Streambank Erosion	Rec Treatment	Unit Price, \$/ft	Cost
001	2,058.73	High	Coir Block with Live Stakes	172	\$355,000.00
002	444.61	Moderate	Coir Block with Live Stakes	172	\$77,000.00
003	3,082.55	Moderate	Coir Block with Live Stakes	172	\$531,000.00
Note: Includes cost to stabilize both banks					\$963,000.00

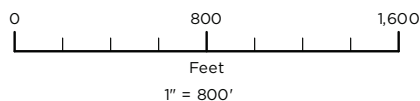


## Indian Springs Metropark Streambank Stabilization Siting

Source: Data provided by OHM Advisors, Huron Clinton Metroparks and Near Map. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl

Map Published: June 27, 2019



### S3-IND-001

Length: 2,058.73 ft

Recommended Treatment: Coir Blocks with Live Stakes

Construction Cost: \$355,000



Springfield Township

S3-IND-001

### S3-IND-001

▲ Stream Stabilization Site

HCMA Park Boundary

#### Streambank Erosion

Very High

High

Moderate

Moderate / Low

Low

Very Low

No Value

Roads

Municipal Boundary

Hydrology

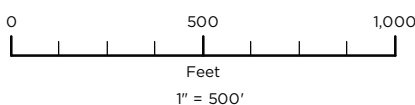
002

## Indian Springs Metropark Streambank Stabilization Siting

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Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl

Map Published: June 25, 2019



### S3-IND-002

Length: 444.61 ft

Recommended Treatment: Coir Block with Live Stakes

Construction Cost: \$77,000

Springfield Township

**S3-IND-002**

### S3-IND-002

▲ Stream Stabilization Site

HCMA Park Boundary

#### Streambank Erosion

Very High

High

Moderate

Moderate / Low

Low

Very Low

No Value

Roads

Municipal Boundary

Hydrology



Indian Springs Park Bike Path

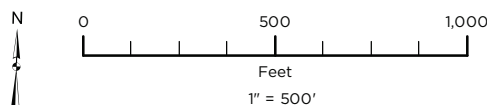
Indian Springs Metropark

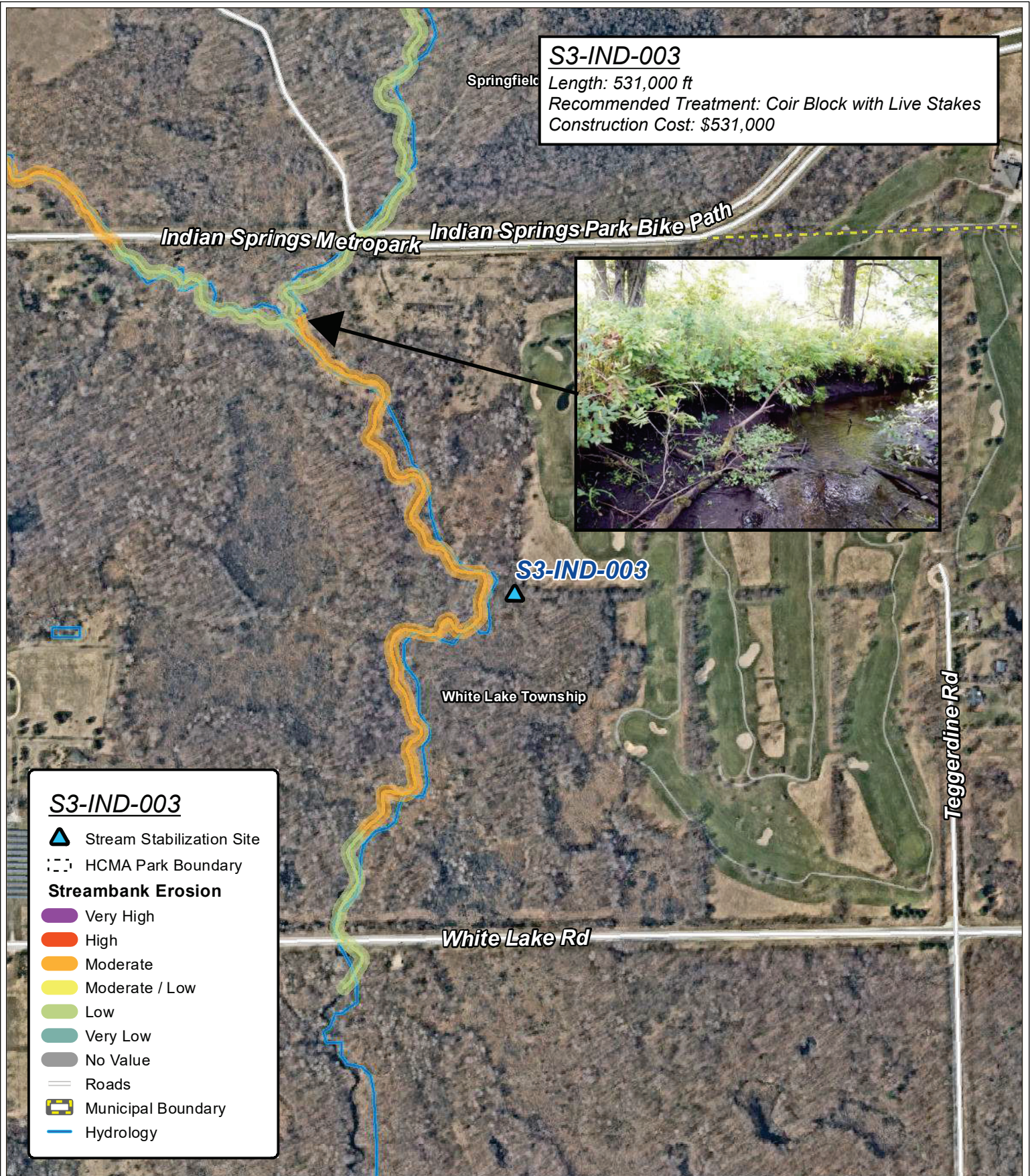
## Indian Springs Metropark Streambank Stabilization Siting

Source: Data provided by OHM Advisors, Huron Clinton Metroparks and Near Map. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

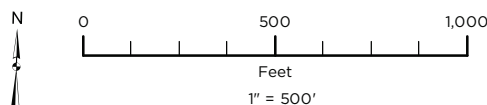
Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl

Map Published: June 25, 2019





## Indian Springs Metropark Streambank Stabilization Siting



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Map Published: June 25, 2019



## Indian Springs Metropark Shoreline Summary and Recommendations



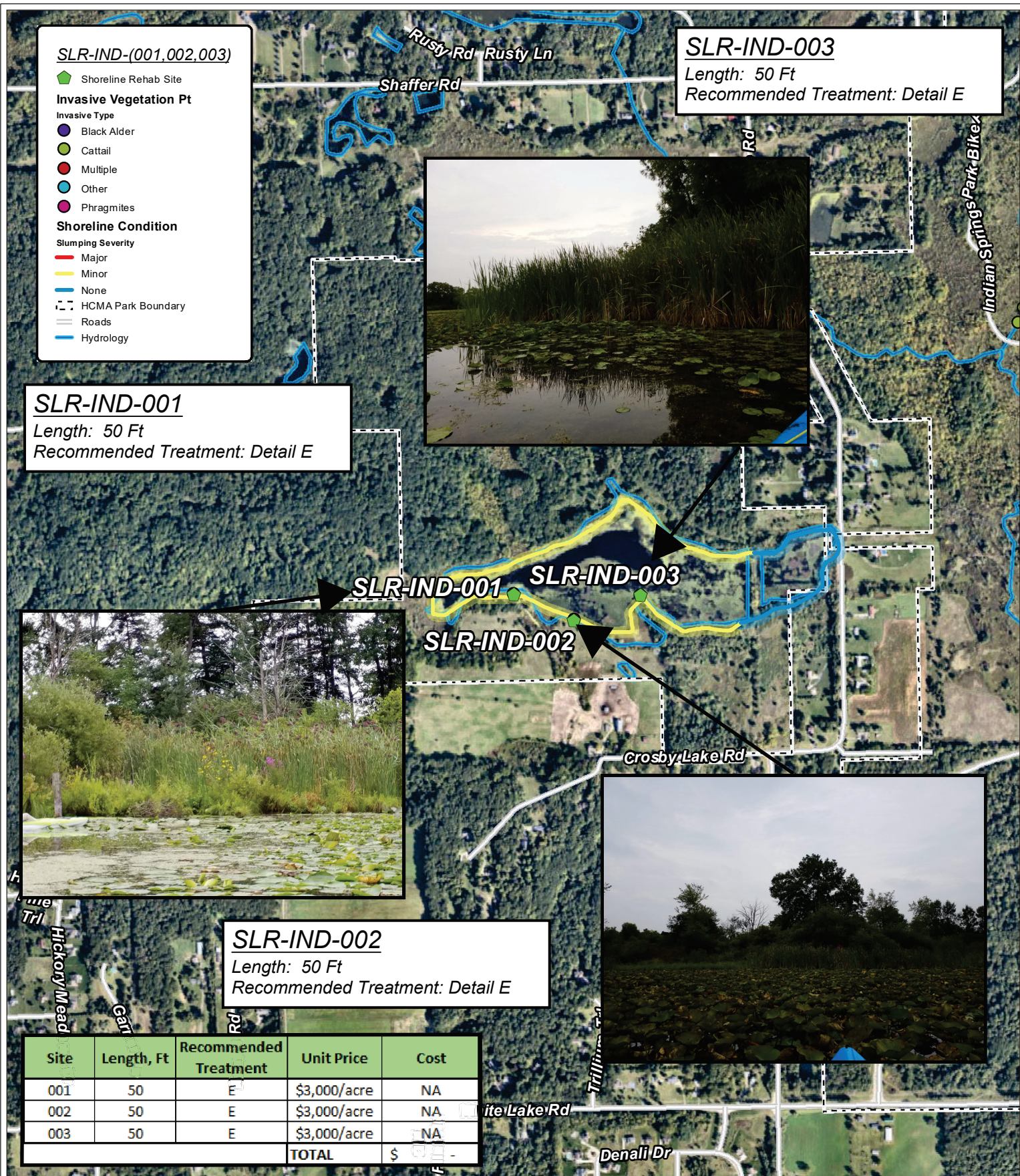
*Minor slumping in Indian Springs Metropark.*

Table 7. Shoreline Inspection Summary

Erosion Condition	Length of Shoreline (ft)
Major	0.0
Minor	5,869.4
None	5,411.2
<b>Total:</b>	<b>11,280.6</b>
<b>Restoration Cost:</b>	<b>NA</b>

The shoreline in Indian Springs Metropark is composed of several small lakes and ponds. All recommended restoration activity will take place on Schmitt Lake.

All shoreline in Indian Springs Metropark consists of vegetated low banks.

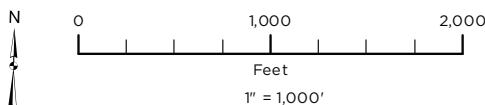


## Indian Springs Metropark Shoreline Rehabilitation Siting

Source: Data provided by OHM Advisors, Huron Clinton Metroparks and Near Map. OHM Advisors does not warrant the accuracy of the data and/or the map. This document is intended to depict the approximate spatial location of the mapped features within the Community and all use is strictly at the user's own risk.

Coordinate System: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl

Map Published: October 22, 2019



## Indian Springs Metropark Green Infrastructure Recommendations

In Indian Springs, the green infrastructure practices listed in Table 1 are recommended to improve water quality and ameliorate flooding issues in the park where feasible. These practices are also outlined on the attached green infrastructure maps.

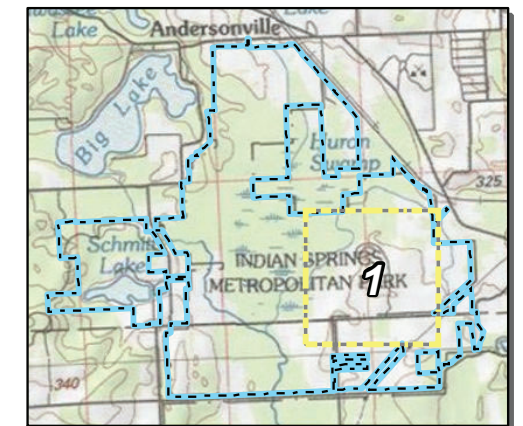
**Table 8.** Indian Springs Green Infrastructure Recommendations

Site ID	Site	Practice Type	Treatment Surface Area (ft <sup>2</sup> )	Cost Opinion	Cost per sq ft of Treatment Area (\$/ft <sup>2</sup> )
<b>GI-IND-01</b>	Golf Course	Stormwater Treatment Wetland	14,600	\$161,576	\$11.07
<b>GI-IND-02</b>	Indian Trail	Naturalized Swale	9,826	\$16,704	\$1.70
<b>GI-IND-03</b>	Indian Trail	Naturalized Swale	11,650	\$19,805	\$1.70
<b>GI-IND-04</b>	Meadowlark	Bioswale	2,760	\$21,927	\$7.94
<b>GI-IND-05</b>	Shelter B	Bioswale	4,820	\$38,292	\$7.94
<b>GI-IND-06</b>	Park Office	Pavement Removal	15,842	\$82,188	\$5.19
<b>Total:</b>			<b>59,498</b>	<b>\$340,492</b>	

# Indian Springs Metropark

Green Infrastructure  
Recommendation Areas

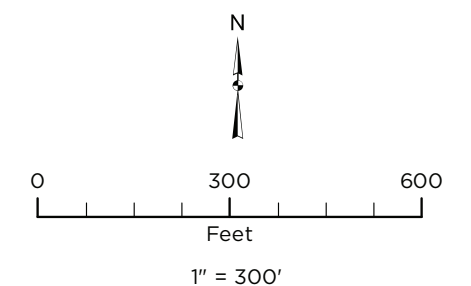
Area: 1 of 1



## Recommendation Area

### GSI Type

-  Bioswale (2)
-  Naturalized Swale (2)
-  Stormwater Treatment Wetland (1)
-  Pavement Removal (1)
-  Stormwater Gravity Main
-  Culvert (18)
-  HCMA Park Boundary
-  Roads



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**Coordinate System:** NAD 1983 StatePlane Michigan South FIPS 2113 IntlFeet

**Map Published:** October 1, 2019



## Indian Springs Metropark Recommendation Prioritization

Each table in this section is prioritized, with the most urgent projects listed first. Projects with **red** Site IDs need immediate attention. Projects with **green** Site IDs can be accomplished by HCMA staff. **Bold** projects may be eligible for grant funding. Underlined projects may be good volunteer or education opportunities. All other projects will likely require annual budget allocations to complete.

Table 9. Indian Springs Culvert Repair Priorities

Culvert ID	Diameter (in)	Length (ft)	Condition	Maintenance Need	Cost Opinion
CUL-IND-019	6	35	Failing	Replacement	\$3,519
CUL-IND-016	6	25	Failing	Replacement	\$2,467
CUL-IND-015	6	16	Failing	Replacement	\$1,602
CUL-IND-018	6	15	Failing	Replacement	\$1,474
CUL-IND-036	60	9	Poor	Replacement	\$5,120
CUL-IND-034	12	74	Poor	Replacement	\$9,306
CUL-IND-022	12	31	Poor	Replacement	\$3,817
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CUL-IND-033	60	97	Fair	Future Cleanout	\$2,428
CUL-IND-002	40	9	Moderate	Immediate Cleanout	\$84
CUL-IND-005	66	12	Moderate	Future Cleanout	\$396
CUL-IND-020	15	20	Fair	Future Cleanout	\$69
<b>Total:</b>					<b>\$32,874</b>

Table 10. Indian Springs Outfall Repair Priorities

Outfall ID	Diameter (in)	Condition	Maintenance Need	Cost Opinion
SDC-IND-009	8	Poor	Replacement	\$5,000
<b>Total:</b>				<b>\$5,000</b>

Table 11. Indian Springs Stormwater Gravity Main Repair Priorities

Stormwater Gravity Main ID	Diameter (in)	Length (ft)	Maintenance Need	Cost Opinion
STG-IND-0018	6	88	Partial Replacement, Re-inspection	\$29,339
STG-IND-0020	15	5	Re-inspection	\$8
<b>Total:</b>				<b>\$29,347</b>

Table 12. Indian Springs Green Infrastructure Installation Priorities

Site ID	Site	Practice Type	Treatment Surface Area (ft <sup>2</sup> )	Cost Opinion	Cost per sq ft of Treatment Area (\$/ft <sup>2</sup> )
<b>GI-IND-03</b>	Indian Trail	Naturalized Swale	11,650	\$19,805	\$1.70
<b>GI-IND-02</b>	Indian Trail	Naturalized Swale	9,826	\$16,704	\$1.70
<b>GI-IND-05</b>	Shelter B	Bioswale	4,820	\$38,292	\$7.94
<b>GI-IND-04</b>	Meadowlark	Bioswale	2,760	\$21,927	\$7.94
<b>GI-IND-06</b>	Park Office	Pavement Removal	15,842	\$82,188	\$5.19
<b>GI-IND-01</b>	Golf Course	Stormwater Treatment Wetland	14,600	\$161,576	\$11.07
<b>Total:</b>			<b>59,498</b>	<b>\$340,492</b>	

Table 13. Indian Springs Stream Restoration Priorities

Stream Stabilization Site ID	Length (ft)	Erosion Severity	Recommended Treatment	Unit Cost (\$/ft)	Cost Opinion
<b>S3-IND-001</b>	<b>2,058.73</b>	<b>High</b>	<b>Coir Block with Live Stakes</b>	<b>172</b>	<b>\$355,000</b>
<b>S3-IND-003</b>	<b>3,082.55</b>	<b>Moderate</b>	<b>Coir Block with Live Stakes</b>	<b>172</b>	<b>\$531,000</b>
<b>S3-IND-002</b>	<b>444.61</b>	<b>Moderate</b>	<b>Coir Block with Live Stakes</b>	<b>172</b>	<b>\$77,000</b>
<b>Total:</b>					<b>\$963,000</b>

Table 14. Indian Springs Shoreline Rehabilitation Priorities

Shoreline Restoration Site ID	Length (ft)	Recommended Treatment	Unit Cost (\$/acre)	Cost Opinion
<b>SLR-IND-001</b>	<b>50</b>	<b>E (Invasive Species Removal)</b>	<b>\$3,000</b>	<b>NA</b>
<b>SLR-IND-002</b>	<b>50</b>	<b>E (Invasive Species Removal)</b>	<b>\$3,000</b>	<b>NA</b>
<b>SLR-IND-003</b>	<b>50</b>	<b>E (Invasive Species Removal)</b>	<b>\$3,000</b>	<b>NA</b>