

Existing Conditions Report

BUFFALO COLOR PENINSULA

Buffalo, NY



AUGUST 2016

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1 INTRODUCTION

1.1 Background

This project is designed to restore and improve shoreline habitat at the Buffalo Color Peninsula site. Ecological restoration at this site will contribute to the Buffalo Area of Concern (AOC) objective to improve approximately 2,645 linear feet of shoreline habitat and approximately 1.5 acres of riparian buffer habitat.

1.1.1 The Project Area and Site Description

The Buffalo Color Peninsula project area, is located on the Buffalo River in the City of Buffalo, Erie County, New York. The site is located off of South Park Avenue on the right descending bank of the Buffalo River, approximately 4.25 miles upstream of the river's mouth. The site is bounded to the north by an abandoned railroad right-of-way owned by the Niagara Frontier Transit Authority and to the west by an active CSX Transportation rail corridor. The site is owned and managed by South Buffalo Development, LCC.

The 19-acre site (also referred to as 'Buffalo Color Area D') was a former industrial facility used for the production of dyestuff. The Area D peninsula is underlain by contaminated soil and groundwater which were remediated and contained in 1997 through the NY State Superfund Program. Remediation and containment activities included capping the upland portion of the site, constructing a bentonite slurry wall around the entire perimeter of the peninsula, constructing an extraction well network and treatment plant for the treatment of contaminated groundwater, installing erosion control along the riverbanks and installing perimeter monitoring wells. The upland capped portion of the site was planted with grasses and other low growing plant species and is maintained as a grassy meadow. Mowing takes place once per year in the fall.

The project area consists of a 25-foot wide shoreline buffer surrounding the peninsula. The surface in this area is covered in rip-rap, underlain by a woven synthetic geotextile fabric which, in turn, is underlain by unclassified fill material. In 1998, there was an effort to vegetate the rip-rap. Topsoil was used to fill the voids between the stones and planted with native shrub species including dogwoods (*Cornus spp.*), willows (*Salix spp.*), speckled alder (*Alnus incana*), and buttonbush (*Cephalanthus occidentalis*). Periodic monitoring occurred after this restoration effort, and were initially deemed successful (Parsons, 1999 as cited by Raybuck, n.d.). Over time, large gaps in the vegetative cover emerged, and a number of non-native and invasive species, including European black alder (*Alnus glutinosa*), tree of heaven (*Ailanthus altissima*), and Japanese knotweed (*Reynoutria japonica*) have colonized the site. In many places, the topsoil fill installed in the interstitial spaces of the rip-rap has settled or washed away, leaving empty spaces among the rip-rap. The original plantings are now seen as only partially successful.

In 2015, emergent and submerged aquatic vegetation was planted around the Buffalo Color Peninsula as part of the Great Lakes Legacy Act. These plantings will contribute to riverine habitat for fish, amphibians, reptiles, mammals, and birds. The monitoring plan for these plantings are outlined in Severson Environmental's monitoring plans (Severson, 2016a and 2016b). The emergent and submerged aquatic plantings are not maintained or monitored by RIVERKEEPER and will not be disturbed by this project.

1.1.2 Project Goals

This project will build on the previous planting efforts completed in the late 1990s and the emergent restoration efforts made more recently as part of the Great Lakes Legacy Act, to create valuable habitat for native plants and wildlife. The project goal is to create a resilient, adaptable native plant community. The natural community created by this effort will contribute to populations of native shrubs and herbs, as

well as insects, birds, and reptiles and amphibians by enhancing a minimum of 2,645 linear feet of shoreline habitat and approximately 1.5 acres of riparian buffer habitat. This amounts to roughly 13.3% of the shoreline restoration goal for the AOC. Restoration efforts will allow for the creation of valuable habitat without compromising the integrity of the site's environmental contamination protection features.

Success will be reached if native plant species richness and areal percent cover increase between the initial inventory and the end of the three-year monitoring period in the 25-foot wide project area. An additional measure of success will be evidence of a decrease in the invasive plant species richness and percent cover.

In addition to restoration in the project area, the project will develop meadow management guidelines for the capped Area D. The guidelines will provide the property owner, South Buffalo Development, LLC direction on how to manage the grassy area in a way that most benefits native insects and birds, without risking any harm to the cap and bentonite clay slurry wall.

2 DATA GENERATION AND ACQUISITION

2.1 Ecological and General Site Condition Data Collection Methods

A complete description of the ecological sampling methods is given in the Quality Assurance Project Plan for the project (Gomez and Sullivan, 2016). Prior to fieldwork, background data, including digital imagery, ecological information about Buffalo River shoreline communities as well as historical information about land use at the Buffalo Color Peninsula site, particularly related documents provided to RIVERKEEPER by the New York State Department of Environmental Conservation, were gathered.

Gomez and Sullivan Field Ecologists gathered data on plant communities in the project area. Field Ecologists established 10 permanent 5-meter by 5-meter quadrats). The following data were collected for each quadrat:

- A description of the plant community, based on the ecological communities described in Ecological Communities of New York State (Edinger *et al.*, 2014);
- All plant species rooted within the quadrat;
- Total areal percent cover of all the plant species together;
- Areal percent cover of invasive plant species;
- If non-native species appear to be interfering with native ecosystem function (yes or no);
- If the shoreline nearby appears stable (unstable, moderately unstable, moderately stable, or stable);
- Signs of erosion (e.g., exposed roots or undercutting);
- Additional site challenges; and
- 1 photograph, taken facing north.

For shoreline stability, field crews will use the bank stability definitions from the National Water and Climate Center *Stream Visual Assessment Protocol* (USDA, 1998):

- **Unstable:** Banks may be low, but typically are high; some straight reaches and inside edges of bends are actively eroding as well as outside bends (overhanging vegetation at top of bare bank, numerous mature trees falling into stream annually, numerous slope failures apparent).
- **Moderately Unstable:** banks may be low, but typically are high (flooding occurs 1 year out of 5 or less frequently); outside bends are actively eroding (overhanging vegetation at top of bank, some mature trees falling into steam annually, some slope failures apparent).
- **Moderately Stable:** banks are low (at elevation of active flood plain); less than 33% of eroding surface area of banks in outside bends is protected by roots that extend to the baseflow elevation.
- **Stable:** banks are low (at elevation of active flood plain); 33% or more of eroding surface area of banks in outside bends is protected by roots that extend to the base-flow elevation.

The nature of rip rap was characterized at each quadrat. Categories included:

- Light stone with soil matrix,
- Light stone with voids,

- Medium stone with soil matrix,
- Medium stone with voids,
- Heavy stone with soil matrix, or
- Heavy stone with voids.

Photographs were taken on the south side of each plot, looking north.

3 DATA ANALYSIS, IDENTIFICATION OF PROBLEMS AND OPPORTUNITIES

3.1 Summary of Field Findings

3.1.1 Field Findings in the Study Area

Vegetation

Gomez and Sullivan and RIVERKEEPER staff visited the project area on July 22 and 26, 2016. The location of ten 5-meter by 5-meter plots along the 25-foot wide project area were recorded using a GPS unit (Figure 3.1.1-1, Plots 1-10). Table 3.1.1-1 shows a summary of the data collected at all of the plots. The plant species identified in each plot are shown in Table 3.1.1-2 and photos taken on the south side of each plot are shown as photo monitoring photographs in Appendix A.

Several of the plots spanned the top of the rip-rap and included areas of bare or sparsely vegetated rock. Where the rip-rap was no longer visible, there was a clear shift in vegetation. At a higher elevation and inland from the rip-rap, the plots were dominated by grasses and herbs such as spotted knapweed (*Centaurea stoebe*) with no shrub growth. Soils in this area appeared to be shallow and fast-draining. More shrubs and small trees, including staghorn sumac (*Rhus typhina*), European black alder, dogwoods (*Cornus spp.*), and tree of heaven were present closer to the shoreline.

Overall, there were 39 plant species identified within sample quadrats on the site. According to the New York Flora Atlas (Weldy *et al.*, 2016), 18 of these species are native to New York State, and at least 14 are non-native. The iris that was seen in plot 8 could not be identified due to a lack of inflorescence or seed; however, it was probably yellow iris (*Iris pseudoacorus*), which is non-native. At least five of the non-native species are on the 6 NYCRR Part 575 list of prohibited plants (NYSDEC, 2016). Yellow iris is also on this list and would bring the total of invasive species to six.

Ten one-meter by one-meter plots were also established in the upland meadow area (Figure 3.1.1-1, Plots 11-20). Twelve plant species were present within these sampling plots (Table 3.1.1-3). The only native species was common milkweed (*Asclepias syriaca*). There were only three milkweed plants present within meadow plots. Both were exceptionally small for the species and neither had flowered in 2016. Photos from the meadow sampling plots are shown in Appendix B.

Exposed rip-rap on the site varies in stone size. Figure 3.1.1-2 shows examples of typical stone sizes within the sampling plots. The photos in this figure also show the lack of sediment covering much of the rip-rap.

Field ecologists also took notes on areas outside of sampling plots with potential for restoration. Figure 3.1.1-3 shows areas along the shoreline where black alder are less abundant.

Breeding Bird Survey

Gomez and Sullivan and RIVERKEEPER staff returned to the project area on August 5 to perform a breeding bird survey. Bird species that were seen or heard from the site were noted. The Field Ecologists stood at two permanent locations for fifteen minutes each. Each bird seen and each call or song heard was considered an observation, even if the same species was seen or heard multiple times. The type of observation (visual or audial) was noted for each observation. Observations were grouped by five minute intervals (0-5 minutes, 5-10 minutes, and 10-15 minutes). In addition to the species observed during the survey periods, Baltimore Oriole, Eastern Wood-Pewee, Red-Tailed Hawk, and Yellow Warbler were also at the site.

Table 3.1.1-1. Data Summary for Vegetation Plots 1-10

	Plot Number									
	1	2	3	4	5	6	7	8	9	10
Plant community description from data sheet	Brush cover	Brush cover	Brush cover	Brush cover	Grasses and herbs, with brush cover closer to river	Grasses and herbs, with brush cover closer to river	Grasses with brush cover closer to river	Brush cover	Bare rock with sparse herbs and shrubs lower in the plot. Grasses cover higher elev.	Bare rock with sparse herbs and shrubs lower in the plot. Grasses and spotted knapweed cover higher elev.
Plant community from Edinger <i>et al</i>	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore	Rip-rap artificial lake shore
Total cover of all species (%)	60	75	90	100	50	70	100	60	60	70
Total cover of non-native herbs and shrubs (%)	20	20	10	20	30	25	5	30	5	10
Are non-natives affecting functions?	No	No	No	No	Yes	Yes	No	Yes	No	Yes
Shoreline stability	Stable	Stable	Stable	Moderately stable	Stable	Stable	Stable	Stable	Stable	Stable

Table 3.1.1-1. Data Summary for Vegetation Plots 1-10

	Plot Number									
	1	2	3	4	5	6	7	8	9	10
Signs of erosion	None	None	None	Rock is in place, but this location has a steeper slope near the water and bare soil near shoreline.	None	None	None	None	None	None
Rip-rap matrix	Medium stone with soil matrix	Medium stone with soil matrix	Light and medium stone with soil matrix	Light stone with soil matrix	Light and medium stone with soil matrix	Light and medium stone with soil matrix	Medium stone with fill and voids	Medium stone with fill and voids	Medium stone with voids	Medium stone with voids

Table 3.1.1-2 Species Found in Project Area Plots 1-10

Species	Common Name	NY status	Plot Number									
			1	2	3	4	5	6	7	8	9	10
<i>Acer negundo</i>	box elder	native	x	x								
<i>Ailanthus altissima</i>	tree of heaven	non-native	x	x	x						x	
<i>Alnus glutinosa</i>	black alder	non-native				x					x	x
<i>Apocynum cannabinum</i>	dogbane	native								x		
<i>Artemisia vulgaris</i>	mugwort	invasive	x	x				x				x
<i>Asclepius syriaca</i>	common milkweed	native		x	x	x	x	x		x	x	x
<i>Centaurea stoebe</i>	spotted knapweed	invasive					x	x	x	x		x
<i>Cornus amomum</i>	silky dogwood	native		x					x			
<i>Cornus sericea</i>	red osier dogwood	native	x	x	x		x	x	x	x	x	
<i>Daucus carota</i>	Queen Anne's lace	non-native	x				x		x			
<i>Eutrochium maculatum</i>	Joe-pye weed	native							x	x		
<i>Frangula alnus</i>	glossy buckthorn	invasive								x		
<i>Fraxinus pennsylvanica</i>	green ash	native							x			
<i>Heliopsis helianthoides</i>	ox-eye sunflower	native				x						
<i>Hypericum perforatum</i>	common St. John's wort	non-native		x					x	x		x
<i>Iris sp.</i>	Iris (likely yellow iris)	unknown								x		
<i>Juglans nigra</i>	black walnut	native	x	x								
<i>Leucanthemum vulgare</i>	ox-eye daisy	non-native	x									
<i>Linaria vulgaris</i>	butter and eggs	non-native										x
<i>Lonicera spp.</i>	honeysuckle shrub	invasive	x	x				x	x		x	x
<i>Lotus corniculatus</i>	bird's foot trefoil	non-native						x	x		x	x
<i>Lythrum salicaria</i>	purple loosestrife	invasive									x	
<i>Melilotus alba</i>	white sweet clover	native	x							x	x	x
<i>Oxalis stricta</i>	yellow wood sorrel	native									x	
<i>Parthenocisus quinquefolia</i>	Virginia creeper	native			x							

Table 3.1.1-2 Species Found in Project Area Plots 1-10

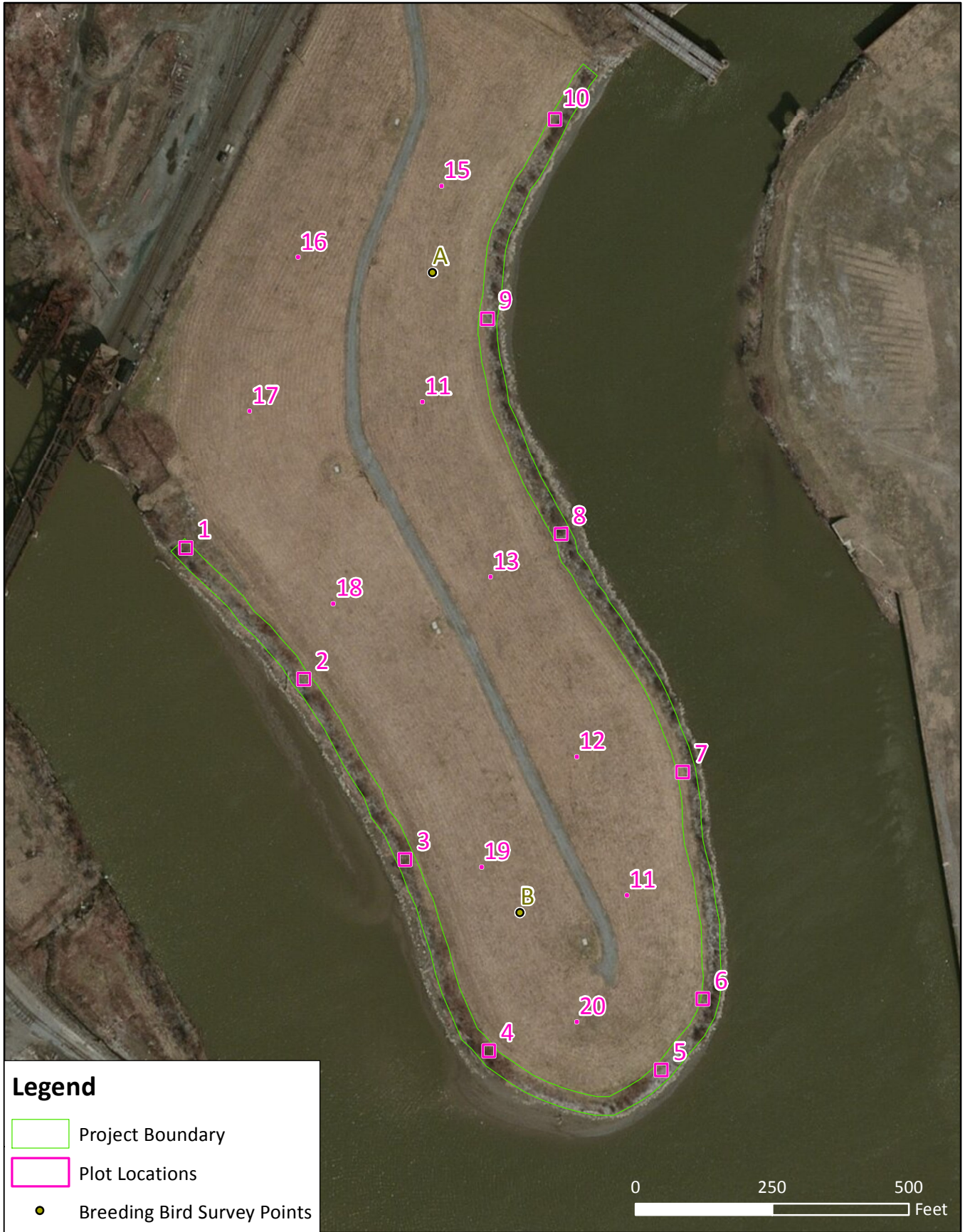
Species	Common Name	NY status	Plot Number										
			1	2	3	4	5	6	7	8	9	10	
<i>Prunus virginiana</i>	choke cherry	native			x								
<i>Reynoutria japonica</i>	Japanese knotweed	non-native			x	x							
<i>Rhus typhina</i>	staghorn sumac	native		x	x						x		
<i>Rubus alleghenienses</i>	blackberry	native	x		x	x	x	x	x				
<i>Rubus ideaus</i>	raspberry	native									x		
<i>Salix purpurea</i>	purple osier willow	non-native								x	x		
<i>Securigera varia</i>	crown vetch	non-native	x	x	x	x	x						
<i>Solidago canadensis</i>	Canada goldenrod	native	x	x	x	x	x		x	x	x		
<i>Urtica dioica</i>	stinging nettle	non-native									x		
<i>Verbascum blattaria</i>	moth mullein	non-native	x	x									
<i>Verbascum thapsus</i>	common mullein	non-native	x										
<i>Vitis riparia</i>	river grape	native	x	x						x			
	grass	unknown	x	x	x			x	x		x	x	x
	unidentified herbaceous plant	unknown	x					x					

Table 3.1.1-3 Species Found in Meadow Plots 11-20

Species	Common Name	NY status	Plot Number									
			11	12	13	14	15	16	17	18	19	20
bird's foot trefoil	<i>Lotus corniculatus</i>	non-native		x	x	x	x	x	x	x		
butter and eggs	<i>Linaria vulgaris</i>	non-native								x		
Canada thistle	<i>Cirsium arvense</i>	invasive	x	x				x				x
common milkweed	<i>Asclepias syriaca</i>	native							x	x		x
Canada goldenrod	<i>Solidago canadensis</i>	non-native		x	x	x						
fescue	<i>Festuca filiformis</i>	non-native	x		x	x	x	x	x	x	x	x
Queen Anne's lace	<i>Daucus carota</i>	non-native								x		x
sulphur cinquefoil	<i>Potentilla recta</i>	non-native						x				
vetch	<i>Vicia sp.</i>	non-native									x	x
white sweet clover	<i>Melilotus alba</i>	non-native	x	x		x	x			x		x
unidentified grass 1					x				x			
unidentified grass 2										x	x	x

Table 3.1.1-4. Bird Species at the Buffalo Color Peninsula

Site	Minute	Species	Number Heard	Number Seen	On-site or Over
Site A	0-5	Common Tern		1	over
		European Starling		1	over
		Field Sparrow		1	on
		Ring-billed Gull	1	2	over
		Savannah Sparrow		1	on
	5-10	American Robin		2	on/over
		Common Tern		1	over
		Ring-billed Gull		1	over
		Rock Pigeon		1	over
		Song Sparrow		1	on/over
		Tree Swallow		1	over
	10-15	American Crow		1	over
		American Goldfinch		1	over
		Common Tern		1	over
		Ring-billed Gull		1	over
		Ring-billed Gull (juvenile)		1	over
		Rock Pigeon		2	over
Site B	0-5	American Goldfinch	1	1	on
		Brown-headed Cowbird		1	on
		Common Grackle		1	on
		Ring-billed Gull		1	over
		Red-winged Blackbird	x		on
		Rock Pigeon		12	on/over
		Song Sparrow	3	1	on
	5-10	Canada Goose		1	water
		European Starling		1	over
		Mallard		1	over
		Ring-billed Gull		8	over
		Tree Swallow		1	over
	10-15	American Goldfinch	1		on
		American Robin		1	on
		Eastern Kingbird		1	on
		European Starling		1	over
		Ring-billed Gull		1	on
		Rock Pigeon		2	over
		Song Sparrow	1		on
		Tree Swallow		2	over



Legend

- Project Boundary
- Plot Locations
- Breeding Bird Survey Points



Map Index

**Buffalo Color Peninsula
Sampling Plot Locations**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community






Elevation is presented in North American Vertical Datum 88.



Legend

- Project Boundary
- Plot Locations
- 1 ft Topographic Lines



Map 1




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 2




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 3




**Buffalo Color Peninsula
Sampling Plot Locations**

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community





Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 4




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 5




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 6




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 7




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 8




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 9




**Buffalo Color Peninsula
Sampling Plot Locations**

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Legend

-  Project Boundary
-  Plot Locations
-  1 ft Topographic Lines



Map 10

**Buffalo Color Peninsula
Sampling Plot Locations**

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Figure 3.1.1-2. Typical Rip-rap Stone Sizes in Sampling Quadrats

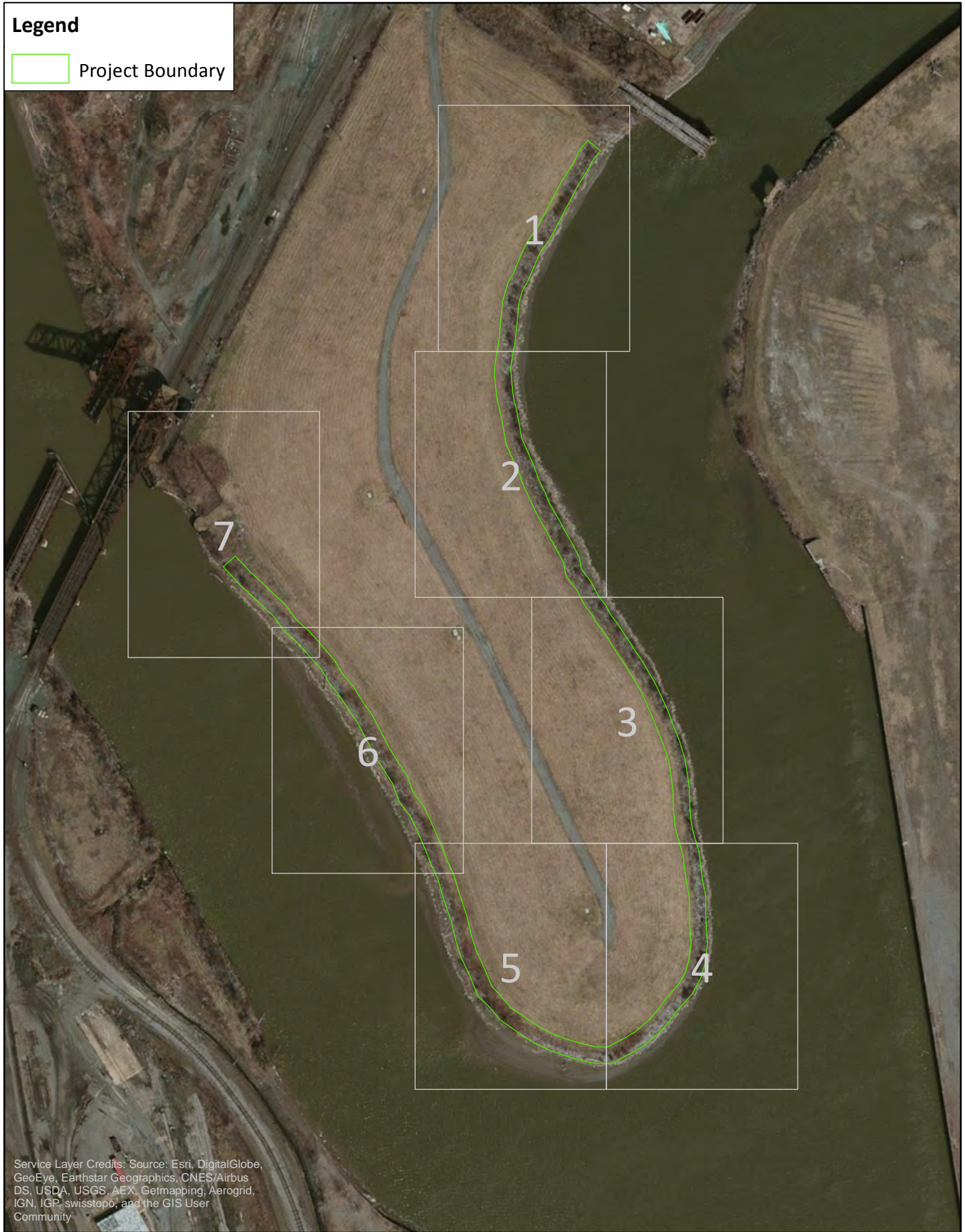


Figure 3.1.1-2. Typical Rip-rap Stone Sizes in Sampling Quadrats



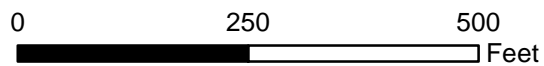
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 Project Boundary






Map Index

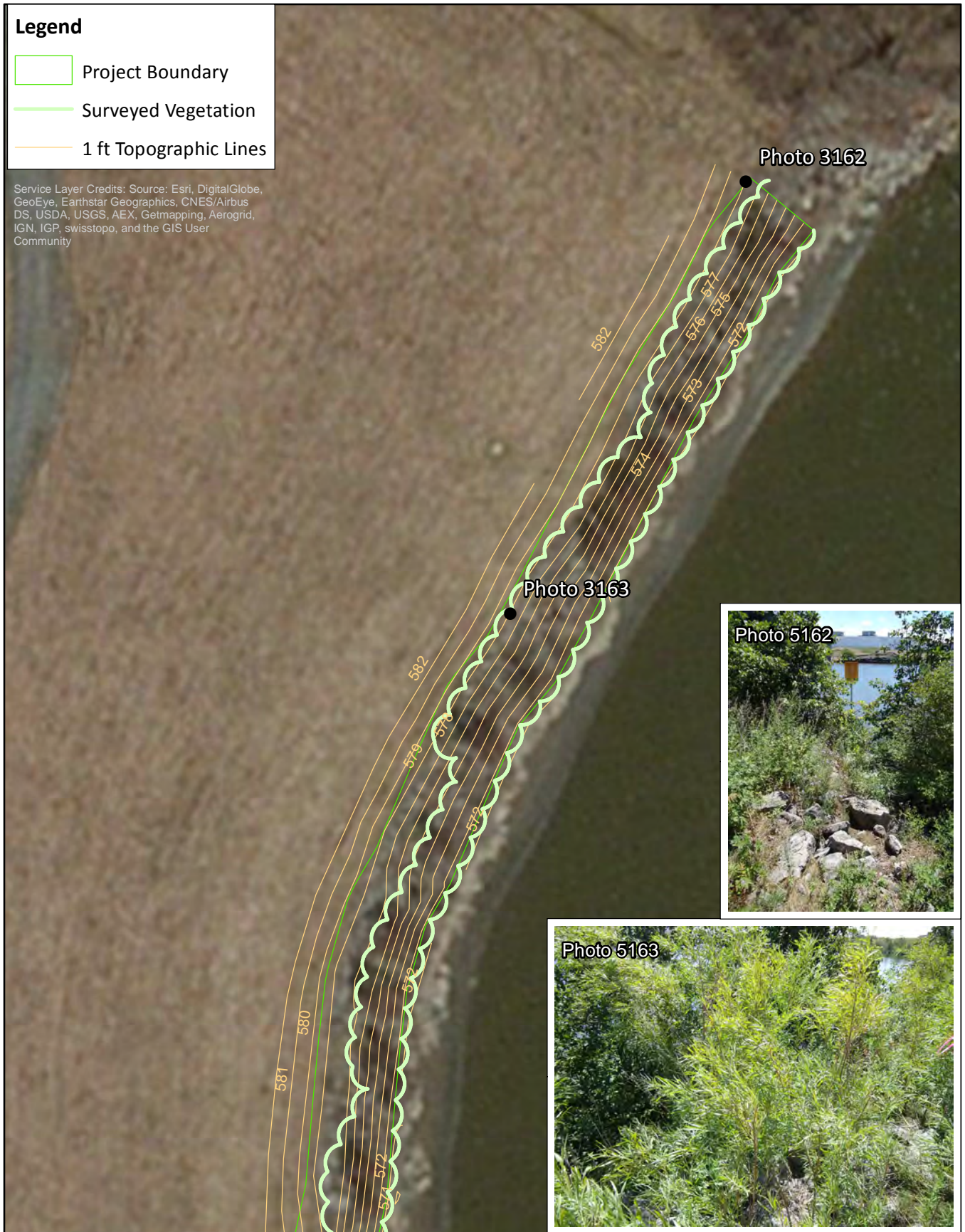
**Buffalo Color Peninsula
Existing Conditions**



Legend

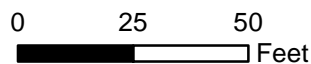
-  Project Boundary
-  Surveyed Vegetation
-  1 ft Topographic Lines

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Map 1

**Buffalo Color Peninsula
Existing Conditions**



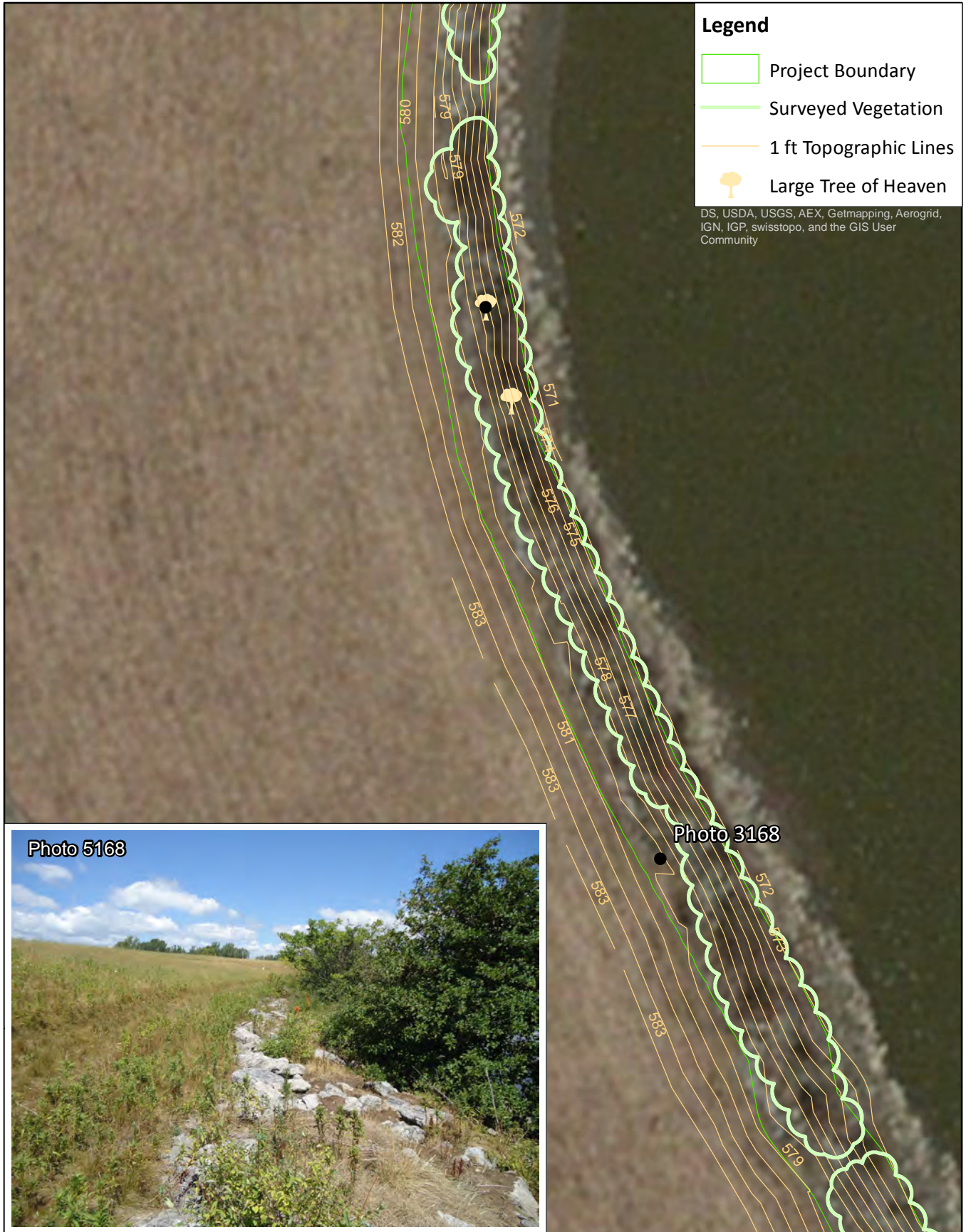


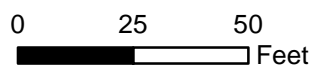
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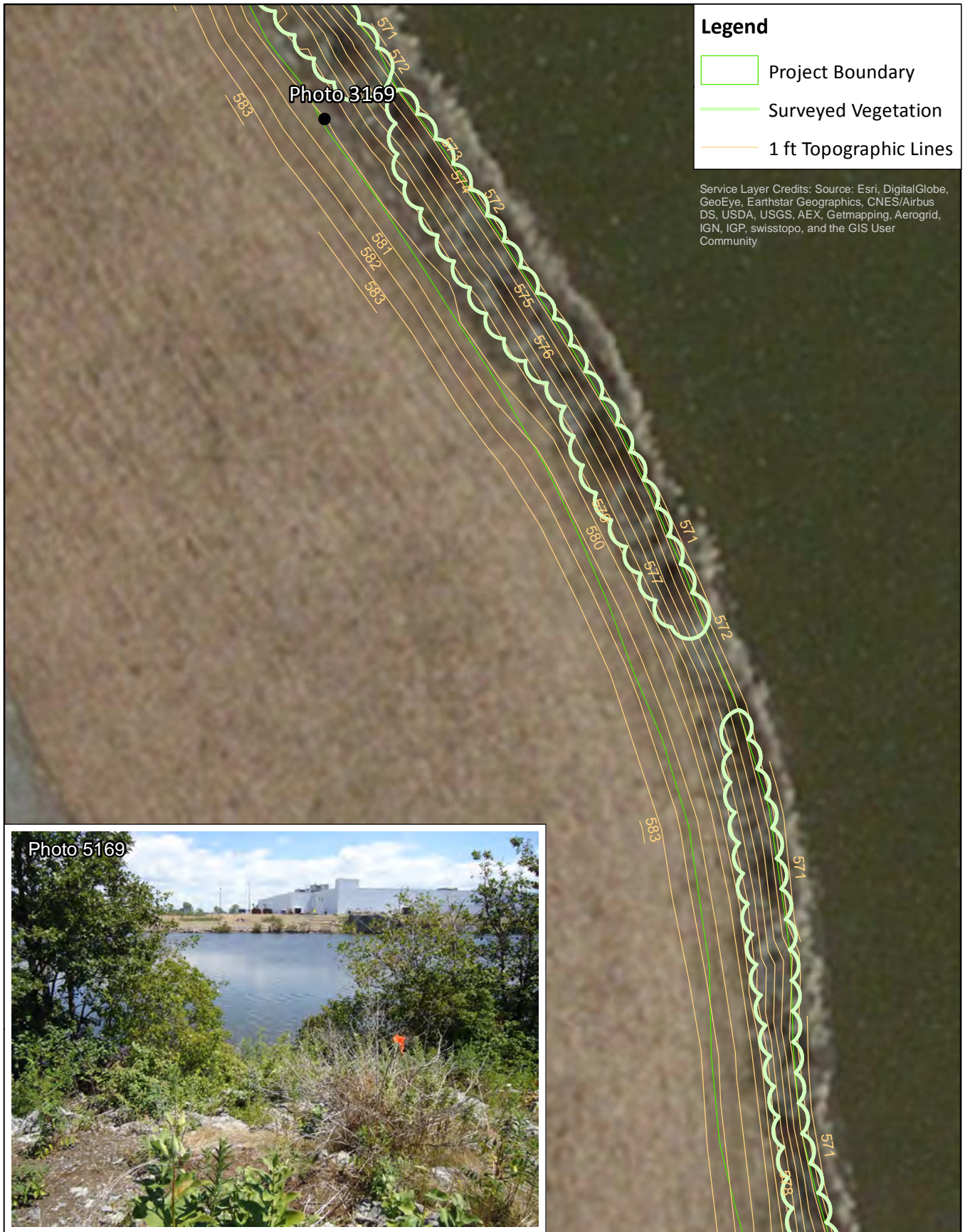
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

Map 2

Buffalo Color Peninsula
Existing Conditions





Legend

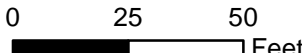
-  Project Boundary
-  Surveyed Vegetation
-  1 ft Topographic Lines

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community






Map 3

**Buffalo Color Peninsula
Existing Conditions**





Legend

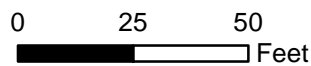
-  Project Boundary
-  Surveyed Vegetation
-  1 ft Topographic Lines

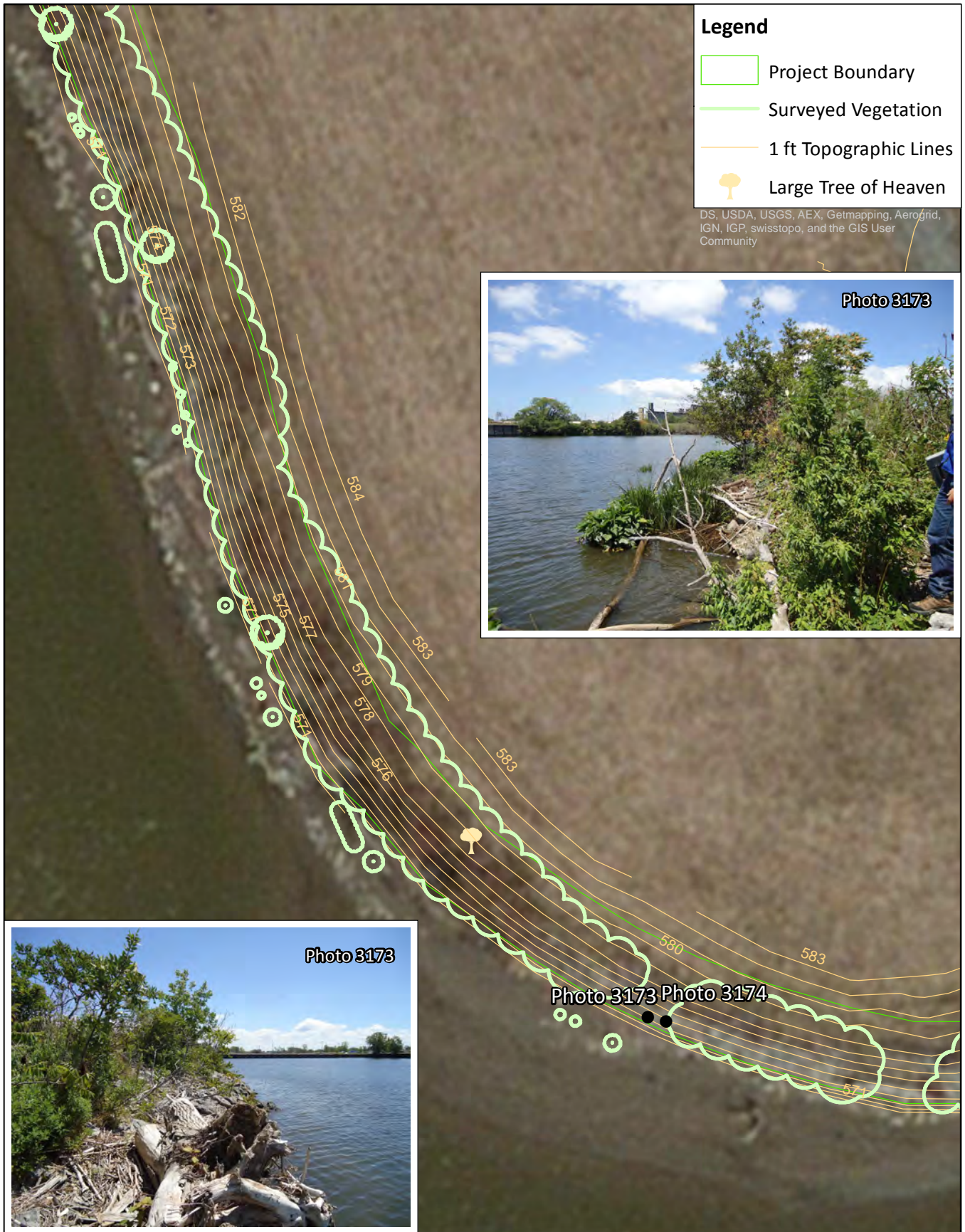
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Map 4

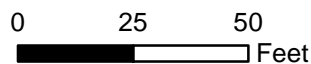
**Buffalo Color Peninsula
Existing Conditions**





Map 5

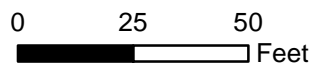
**Buffalo Color Peninsula
Existing Conditions**








Map 6

**Buffalo Color Peninsula
Existing Conditions**





Legend

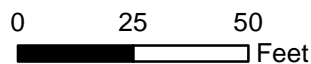
-  Project Boundary
-  Surveyed Vegetation
-  1 ft Topographic Lines

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Map 7

**Buffalo Color Peninsula
Existing Conditions**



3.1.2 Problem Identification

The primary issue at the Buffalo Color Peninsula is the lack of native plant richness and plant cover, particularly at the higher elevations in the rip-rap perimeter. Exposed rip-rap is lacking the soil necessary for abundant plant growth.

Additionally, the majority of European black alders will not be removed from the site during restoration, therefore restoration activities will need to focus on areas where native plants will not be out-competed by the mature alder trees. Alder trees may be removed if they are growing in areas with sufficient existing soil matrix to support native plant growth.

3.1.3 Restoration Opportunities

There are several areas along the perimeter of Buffalo Color Peninsula with potential for habitat enhancements. Due to the restrictions on moving existing rip-rap, an appropriate soil mixture will need to be brought in to fill the voids between rip-rap stones as well as create a layer of soil above some of the rip-rap. Additional tools such as Bio-D blocks made of coir fiber blocks and natural fabric or jute matting will also be used. Native shrubs, vines, and herbaceous plants can be planted in areas of the shoreline where vegetation is currently sparse. This vegetation will eventually grow to shade the rocks and the water, providing habitat for fish as well as migratory and resident birds. At elevations closer to the top of the rip-rap at the upland edge of the project area, restoration efforts can focus on perennial herbaceous plant species such as milkweeds, bee balm, and asters, which are beneficial to native insects.

4 REFERENCES

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APPENDIX A. PHOTOGRAPHS FROM STUDY AREA PLOTS 1-10

Plot 1
Photo Monitoring



Plot 1



Plot 1



Plot 1



Plot 2
Photo Monitoring



Plot 2



Plot 2



Shoreline near Plot 2



Shoreline near Plot 2



Plot 3
Photo Monitoring



Plot 3



Plot 3



Plot 4
Photo Monitoring



Plot 4



Plot 4



Shoreline near Plot 4



Shoreline near Plot 4



Plot 5
Photo Monitoring



Plot 5



Shoreline near Plot 5



Plot 6
Photo Monitoring



Plot 6



Plot 6



Plot 6



Plot 7
Photo Monitoring



Plot 7



Plot 7



Plot 7



Plot 8
Photo Monitoring



Plot 8



Plot 8



Shoreline in and near Plot 8



Shoreline in and near Plot 8



Plot 9
Photo Monitoring



Plot 9



Plot 9



Plot 9



Shoreline near Plot 9



Plot 10
Photo Monitoring



Plot 10



APPENDIX B. PHOTOGRAPHS FROM MEADOW PLOTS 11-15

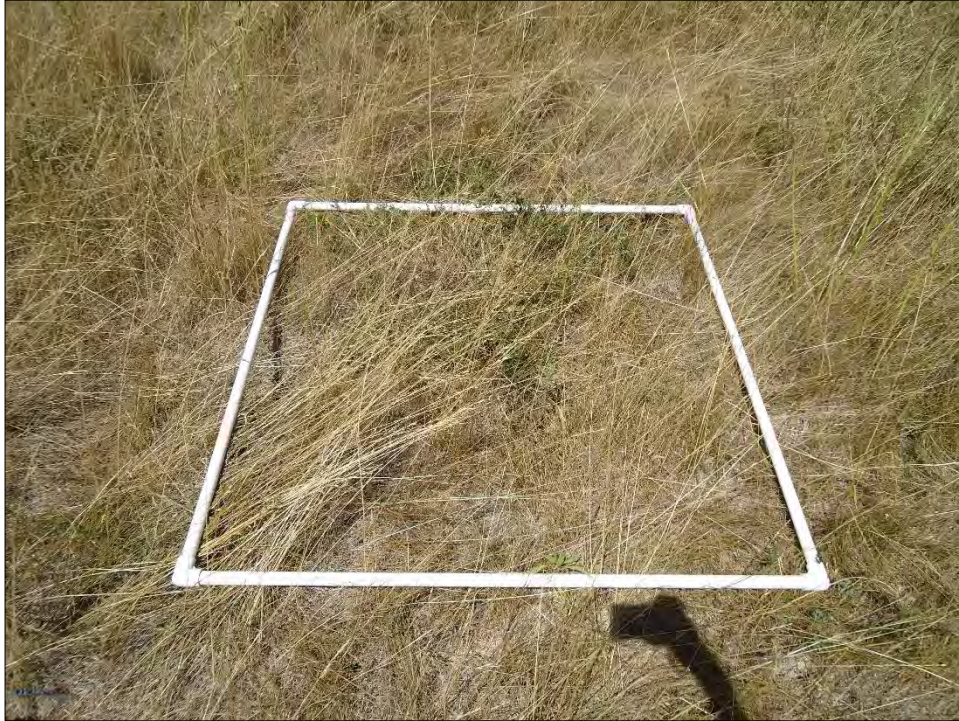
Plot 11
Photo Monitoring



Plot 12
Photo Monitoring



Plot 13
Photo Monitoring



Plot 14
Photo Monitoring



Plot 15
Photo Monitoring



Plot 16
Photo Monitoring



Plot 17
Photo Monitoring



Plot 18
Photo Monitoring



Plot 19
Photo Monitoring



Plot 20
Photo Monitoring

