



Lower Columbia
Estuary
Partnership

Level 3

Site Sampling Plan Design

CEERP Level 3 Action Effectiveness

Monitoring Workshop

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Overview

- Elements of a Level 3 Action Effectiveness Plan
- Monitoring Matrix/Plan
- Placement of post-restoration action effectiveness monitoring

Elements of a Level 3 Action Effectiveness Plan

- Limiting Factor(s)
 - Regional condition that limits ecosystem productivity for out migrating juvenile salmonids
- Restoration Actions
 - Actions chosen to address the limiting factors

Elements of a Level 3 Action Effectiveness Plan

- Goal(s)
 - The overall purpose of the restoration actions
- Objective(s)
 - Desired and measurable outcome(s) of a project
- Monitored Indicator(s)
 - value used to indicate status or trend of a resource or process

Monitoring Matrix/Plan

Site	Limiting Factor	Restoration Actions	Goals	Objectives	Metrics	Level 3 Metrics	Level 2 Metrics
Thousand Acres	Access	Reconnect floodplain wetland to Columbia River through removal of tide gate and water control structure	Restore hydrologic connection and fish access to the disconnected floodplain channel and wetland system	28 acres of wetland habitat inundated at the 23 foot elevation	1. Water Surface Elevation/Water Depth 2. Sediment Accretion	Water Surface Elevation	Channel Cross Sections
				Water temperatures will be suitable for juvenile salmonids during salmonid outmigration periods	1. Water Temperature		
	Habitat	Install large woody debris	Enhance the capacity of the site for juvenile salmonid rearing and high flow refuge habitat	Large woody debris will increase channel complexity and wetland complexity	1. Channel Cross Sections	Sediment Accretion	Vegetation Planting Monitoring
		Restore riparian and wetland plant communities		Restore 75 acres of native wetland riparian and floodplain forest	1. Photo Points 2. Plant Species and Composition		
					75% plant survival after three years	1. Vegetation Planting Monitoring	

Monitoring Matrix/Plan

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Pre-Project Design Monitoring

- Water-surface elevation
- Water Temperature



Level 3 Action Effectiveness

Monitoring goals and objectives



Pre-project design or baseline
monitoring



Placement of post-restoration
monitoring

Level 3 AEM

- Water-surface elevation
- Water Temperature
 - The primary site for data loggers at restoration sites is near the mouth of the tidal reconnection site, but within the hydrological constriction (Roegner et al 2009).
- Photo Points
 - Photo points should be located at vantage points offering views of expected areas of change (Roegner et al 2009).
- Sediment Accretion
 - Sediment accretion stakes should be set prior to restoration in an area likely to be inundated and should be measured once before hydrological reconnection (Roegner et al 2009).

Questions

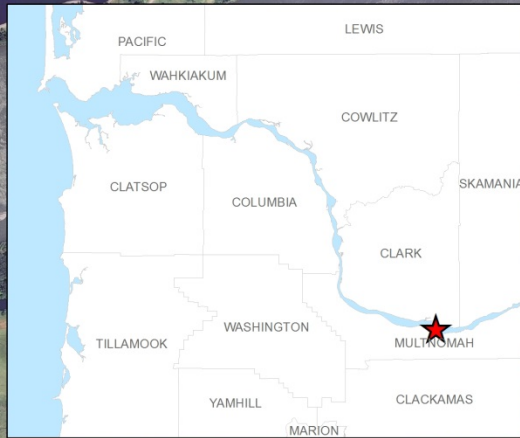


Thousand Acres Level 3 Site Sampling Plan

**CEERP Level 3 Action Effectiveness
Monitoring Workshop**



Site Overview

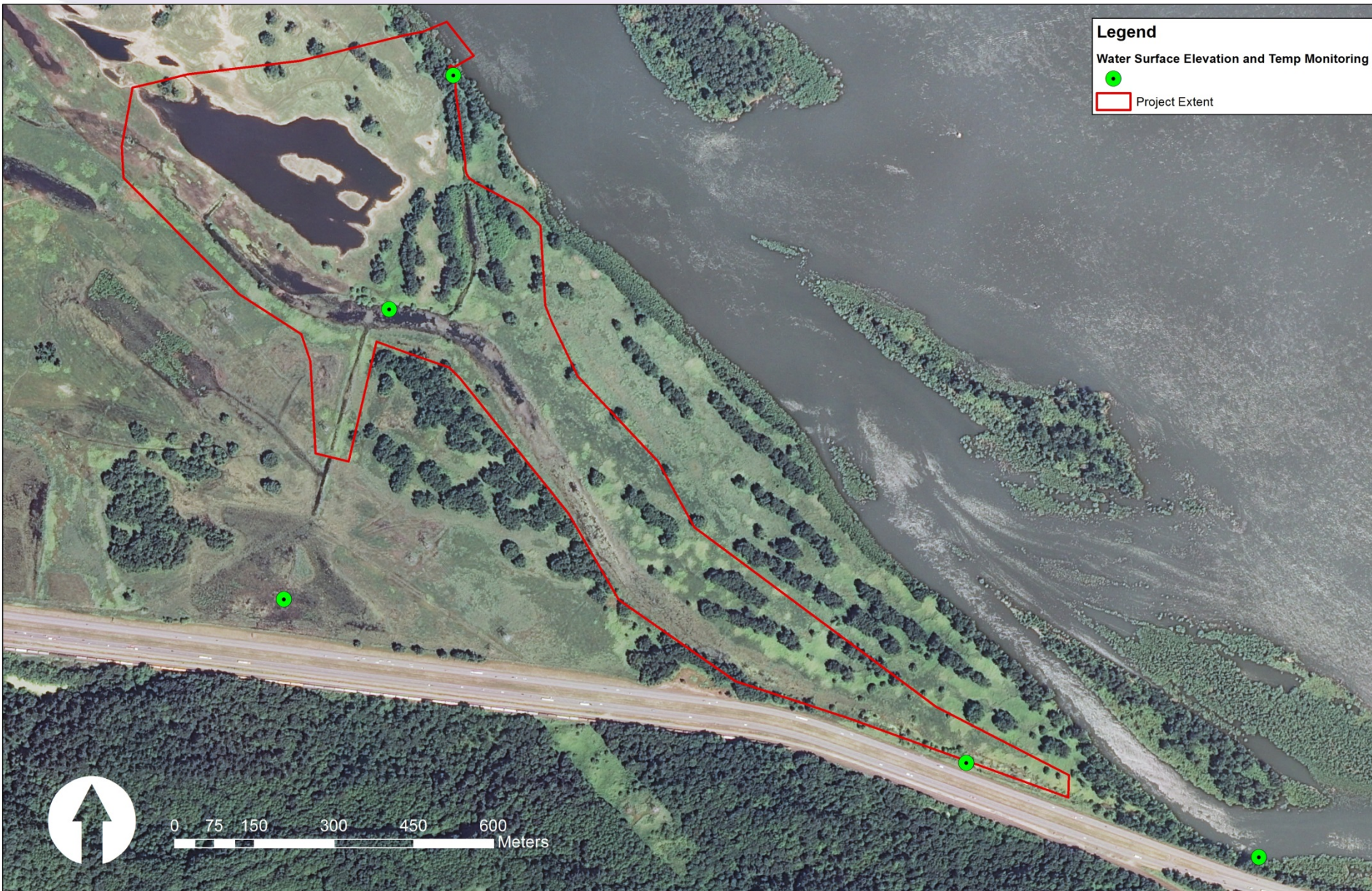


Legend

- ★ Project Location
- Study Area
- Highway
- Railroad



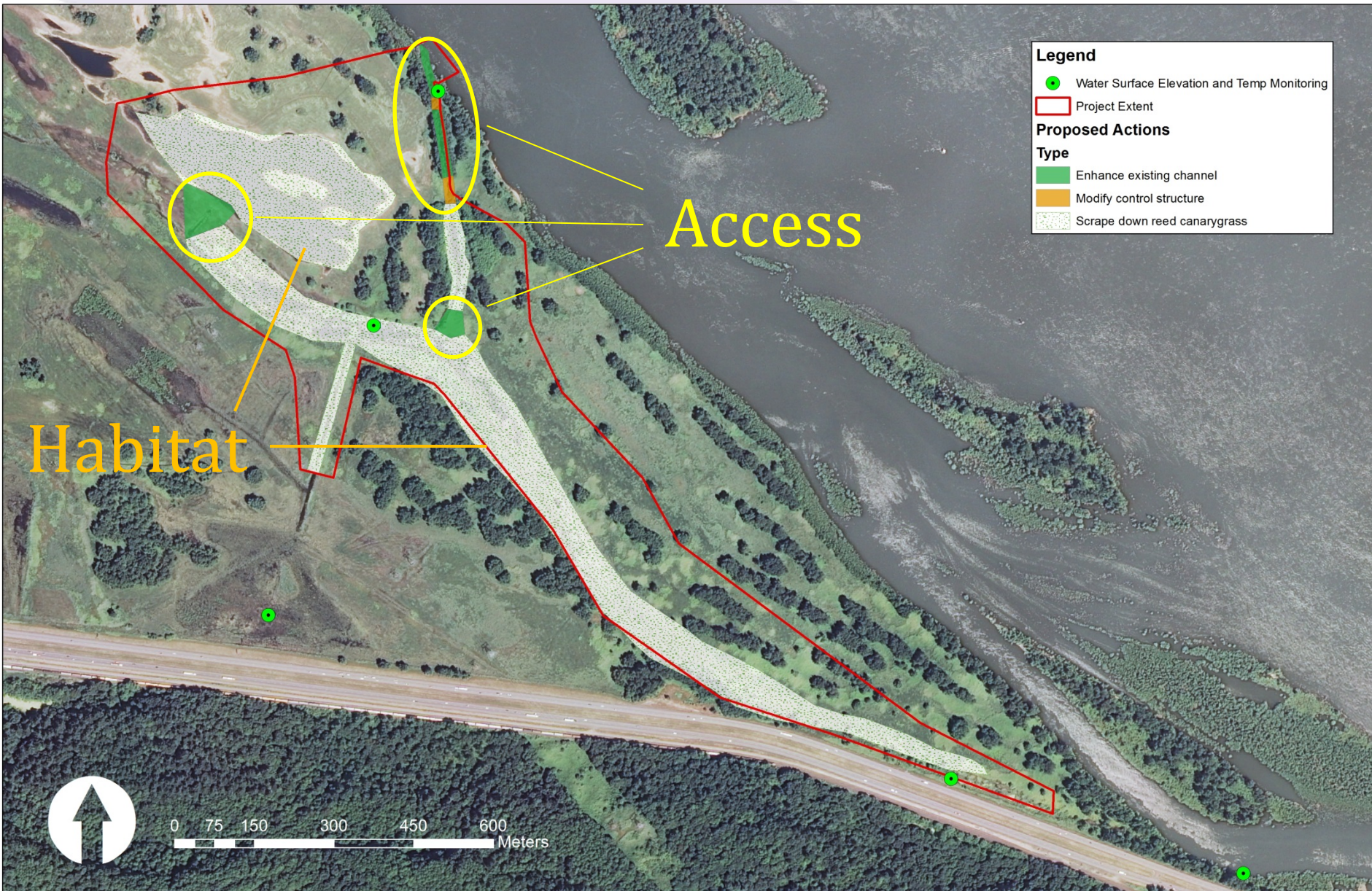
Baseline Monitoring



Restoration Actions & Goals

Limiting Factor	Restoration Actions	Goals
Access	Reconnect floodplain wetland to Columbia River through removal of tide gate and water control structure	Restore hydrologic connection and fish access to the disconnected floodplain channel and wetland system
Habitat	Install large woody debris	Enhance the capacity of the site for juvenile salmonid rearing and high flow refuge habitat
	Restore riparian and wetland plant communities through planting and soil scrape down	

Baseline Monitoring & Proposed Actions



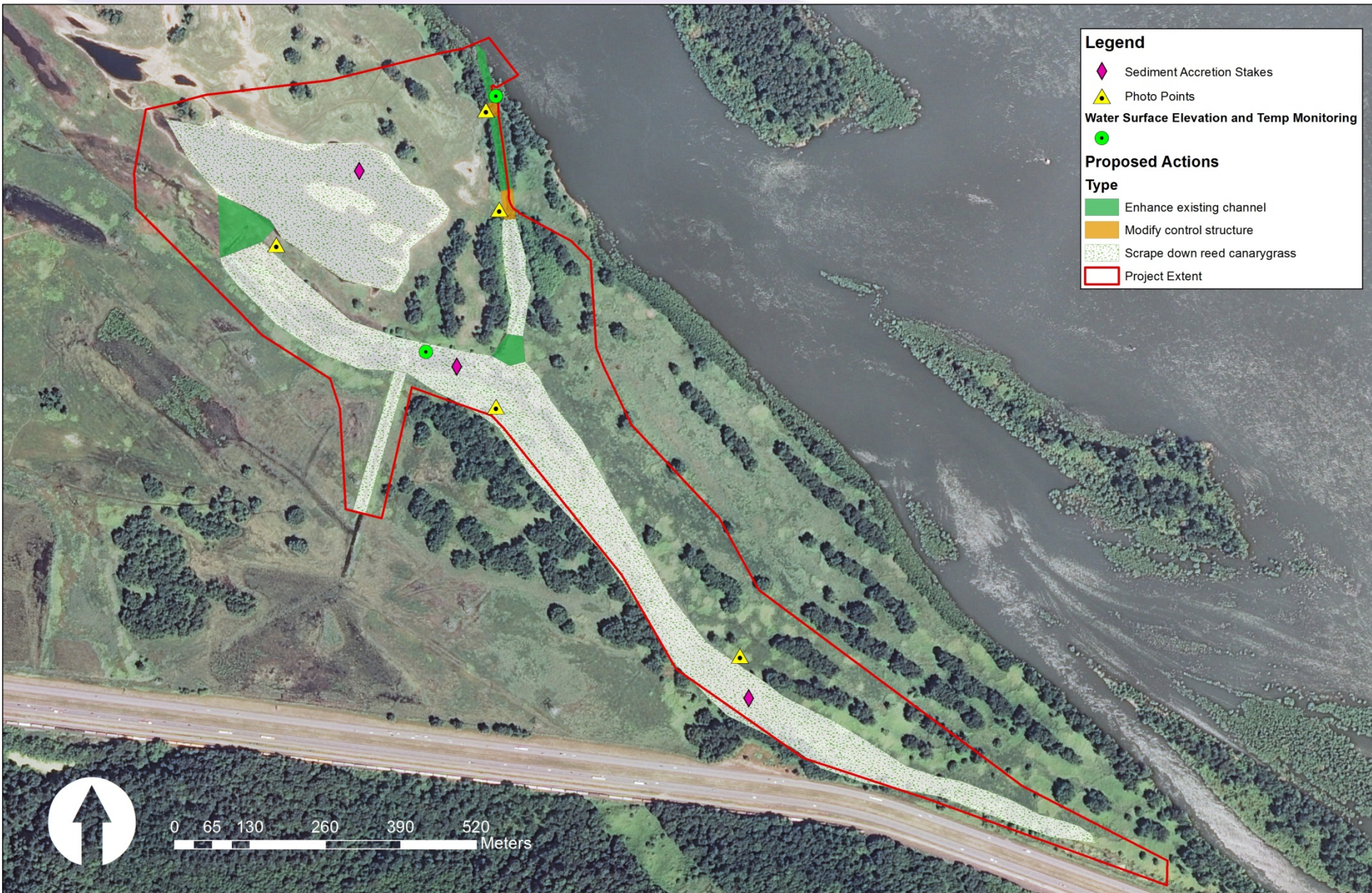
Goals & Objectives

Goals	Objectives
Restore hydrologic connection and fish access to the disconnected floodplain channel and wetland system	➤ 28 acres of wetland habitat inundated at the 23 foot elevation
	➤ Water temperatures will be suitable for juvenile salmonids during outmigration periods
Enhance the capacity of the site for juvenile salmonid rearing and high flow refuge habitat	➤ Large woody debris will increase channel complexity and wetland complexity
	➤ Restore 75 acres of native wetland riparian and floodplain forest
	➤ 75% survival of plantings after three years

Objectives & Metrics

Objectives	Metrics
➤ 28 acres of wetland habitat inundated at the 23 foot elevation	1. Water Surface Elevation/Water Depth 2. Sediment Accretion
➤ Water temperatures will be suitable for juvenile salmonids during salmonid outmigration periods	1. Water Temperature
➤ Large woody debris will increase channel complexity and wetland complexity	1. Channel Cross Sections 2. Photo Points
➤ Restore 75 acres of native wetland riparian and floodplain forest	1. Photo Points 2. Plant Species and Composition
➤ 75% plant survival after three years	1. Vegetation Planting Monitoring

Post Restoration Monitoring & Proposed Actions



Post Restoration Monitoring Totals

Metric	Pre-Restoration	Post Restoration
Water Surface Elevation and Temperature	5	2
Photo Points	5	5
Sediment Accretion	0	3