



UO MILLRACE RESTORATION & ENHANCEMENT PROJECT MILLPOND SECTION

CONCEPT DESIGN

2/25/2022



PLACE

PRESENTATION OUTLINE

- Project Purpose
- Existing Conditions
- Proposed Design
- Permitting Timeline
- Design & Construction Timeline
- ROM Costs
- Next Steps



PROJECT PURPOSE & GOALS

Develop a Concept Design for the Millpond that...

- Improves **water quality**
- Improves/increases **habitat**
- Provides **recreation**
- Provides opportunities for **learning** and research
- Improves site **aesthetics**



EXISTING CONDITIONS

Invasive Plant Species

- Himalayan blackberry (*Rubus discolor*)
- English Ivy (*Hedera helix*)
- European holly (*Ilex aquifolium*)
- Tree of Heaven (*Ailanthus altissima*)
 - Concentrated on the western edge of site
- Poison hemlock (*Conium maculatum*)
- Fennel (*Foeniculum vulgare*)
- Bittersweet nightshade (*Solanum dulcamara*)

Native Plant Species

- Few existing herbaceous wetland species, including slough sedge (*Carex obnupta*)
- Mature trees including bigleaf maple (*Acer macrophyllum*), black cottonwood (*Populus trichocarpa*), Oregon ash (*Fraxinus latifolia*), red alder (*Alnus rubra*), douglas-fir (*Pseudotsuga menziesii*), and vine maple (*Acer circinatum*)
- Shrubs including red-osier dogwood (*Cornus sericea*), oceanspray (*Holodiscus discolor*), Oregon grape (*Mahonia aquifolium*), snowberry (*Symphoricarpus albus*), willow (*salix sp.*), red flowering currant (*Ribes sanguineum*), and Nootka rose (*Rosa nutkana*)



EXISTING CONDITIONS

Invasive & Nuisance Wildlife

- Nutria (*Myocastor coypus*)
- Bullfrog (*Lithobates catesbeianus*)
- Chinese Mystery Snail (*Cipangopaludina chinensis*)
- Canada geese (*Branta canadensis*), native but should migrate

Desirable Wildlife

- Mallard duck (*Anas platyrhynchos*)
- Wood duck (*Aix sponsa*)
- Belted kingfisher (*Megaceryle alcyon*)
- Great blue heron (*Ardea herodias*)
- Redtail hawk (*Buteo jamaicensis*)



EXISTING CONDITIONS

Stormwater Inputs

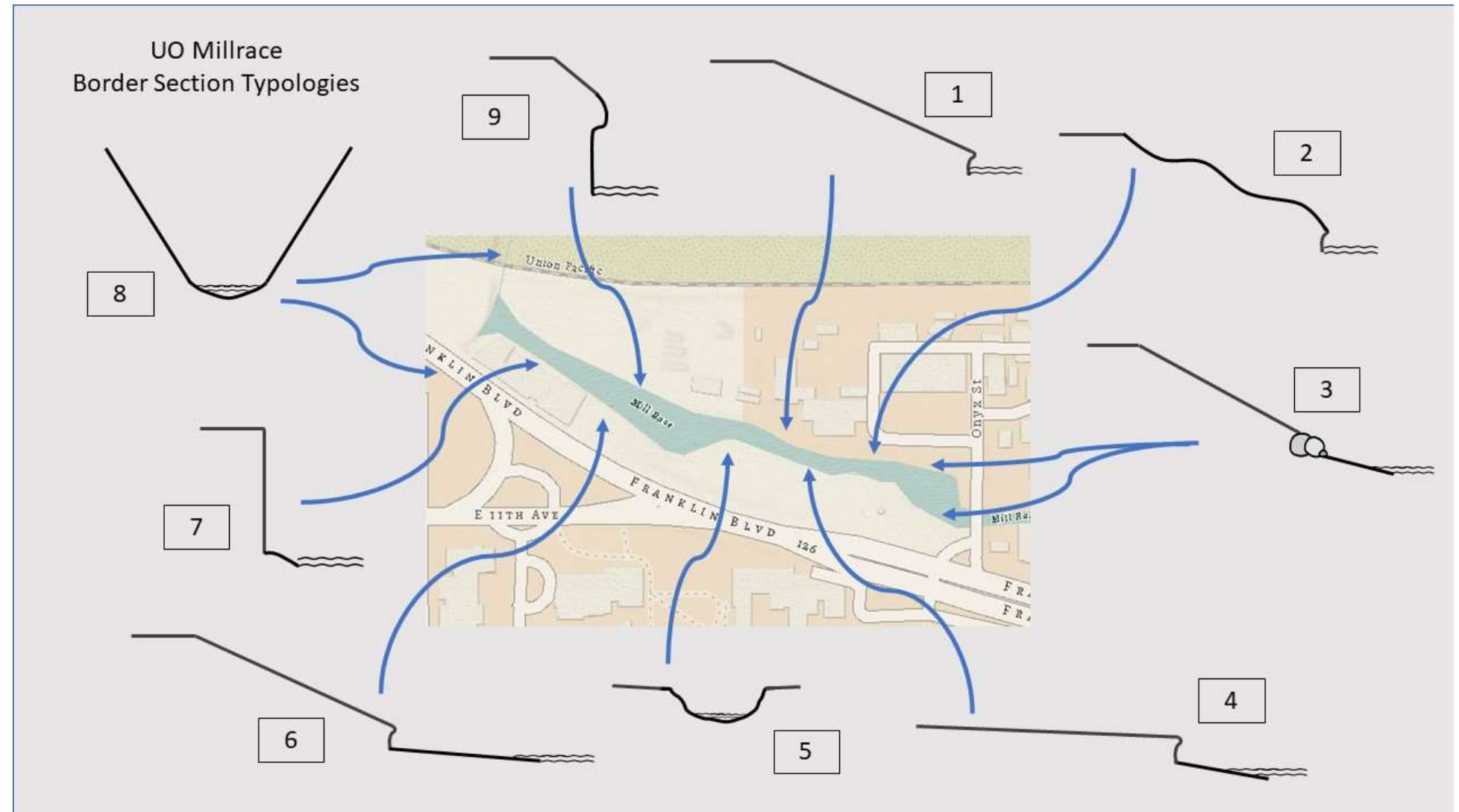
- Millrace for stormwater conveyance
- Existing outfalls
 - City and UO outfalls throughout site



EXISTING CONDITIONS

Eroding/Unstable Bank Conditions

- North bank
 - Nearly vertical, blackberry covered
- South bank
 - Some unvegetated sections
 - Variety of conditions

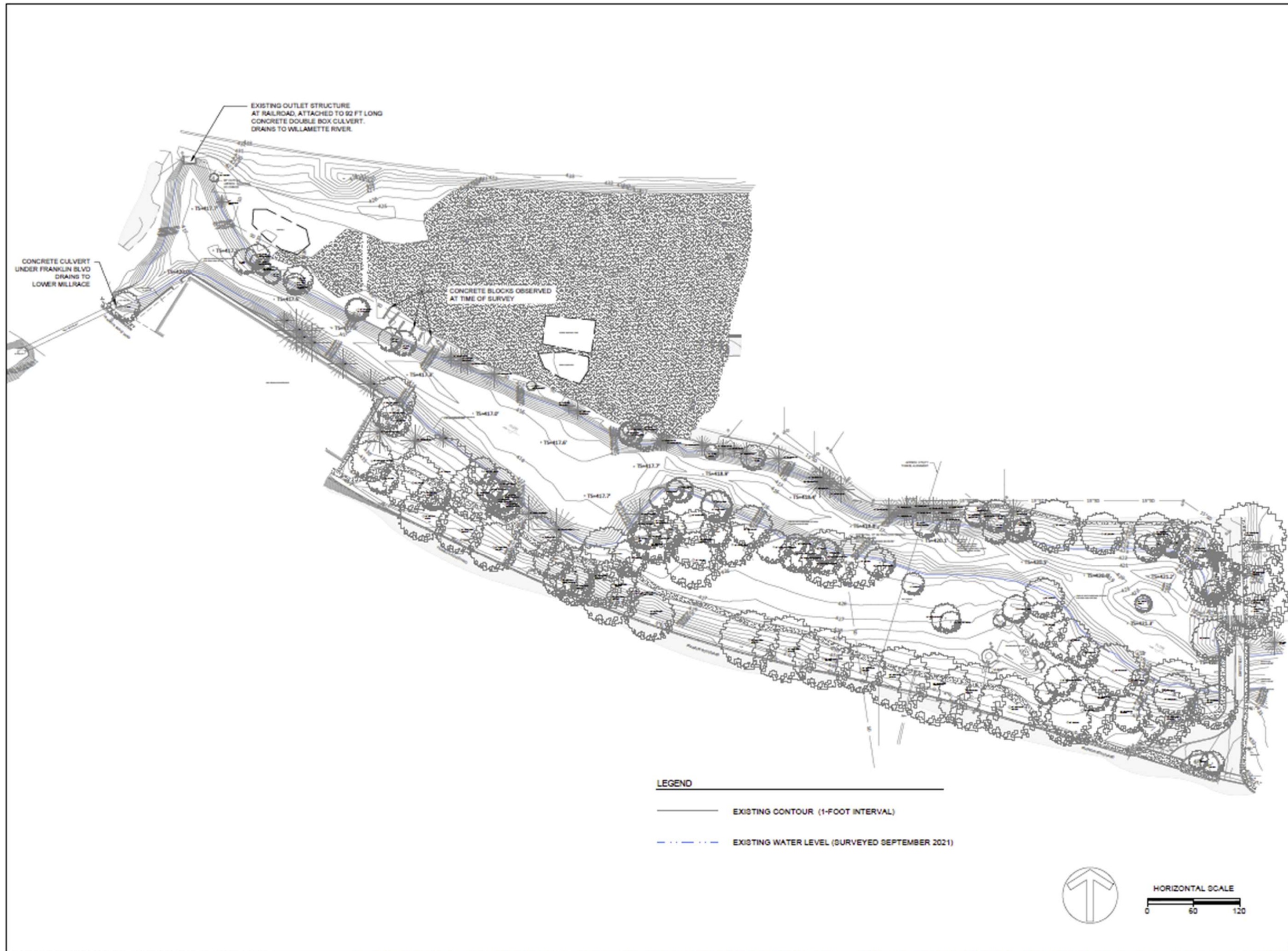


EXISTING CONDITIONS

Downstream Outlets

- Railroad Outlet
 - Drains to the Willamette River
 - Limited adjustments (only blue outlet pipe)
 - Not remotely operable
- Franklin Culvert
 - Drains to Lower Millrace
 - Bathymetry shows high spot before the culvert, Millpond drains to north before going out this culvert





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DATE ISSUES / REVISIONS

kpff

PLACE

UO MILLPOND
ENHANCEMENT
CONCEPT PLAN

EXISTING
CONDITIONS

PROJECT NO.: 21515.01 SCALE: 1"=60'

REV. NO. 01 CD CHECK ML

1 OF 4

2/18/2022

PROPOSED CONDITIONS – GRADING & UTILITY PLAN

Grading

- Dredging to remove accumulated sediment and provide deeper water
- Create a distinct wetland bench along the water's edge, the wetland vegetation will improve water quality

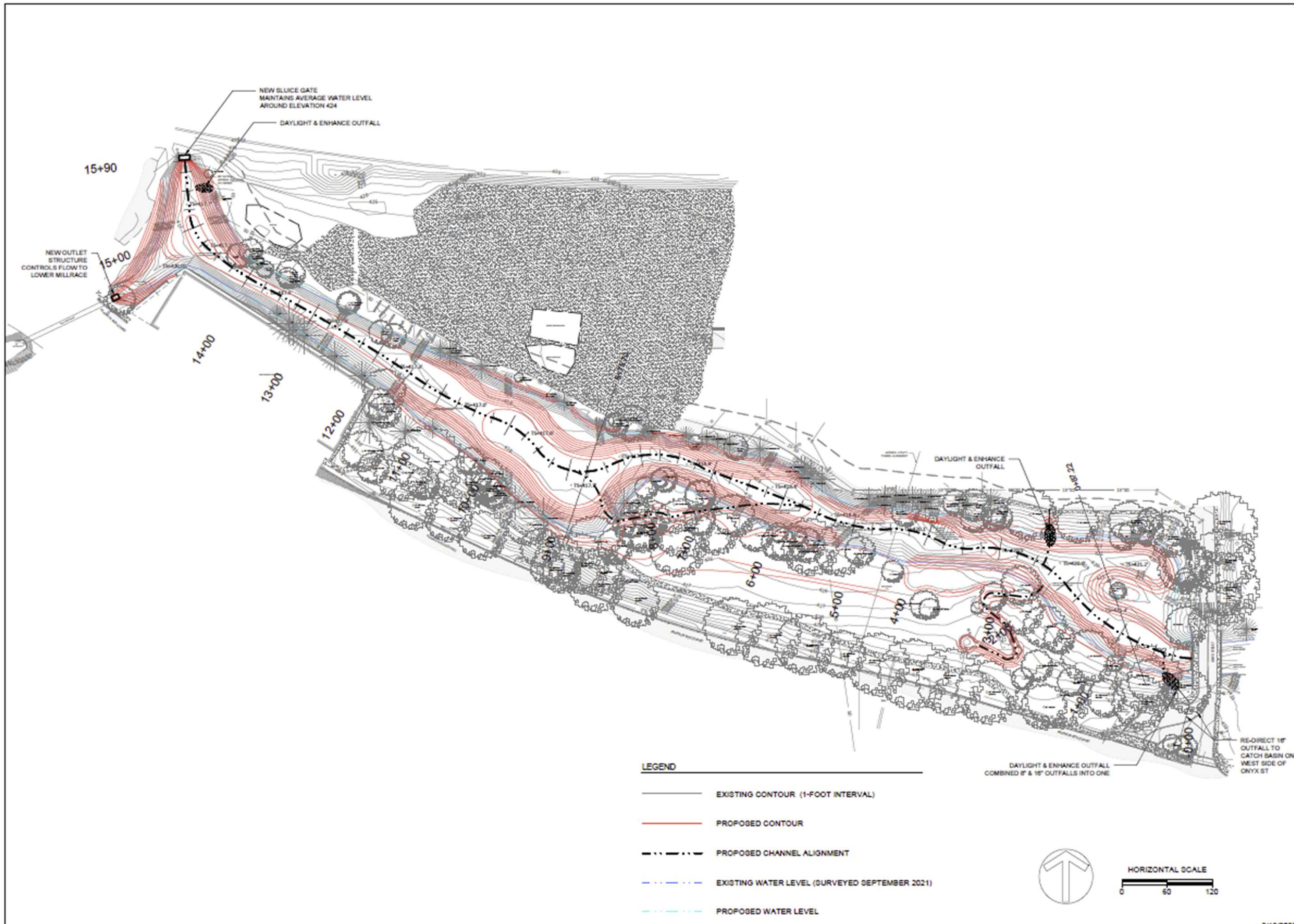
Stormwater Outfall Improvements

- Daylight outlets where possible to provide sediment deposition BEFORE flowing into the Millpond
- Repair the existing design-build bioswale and remove existing seating structure

New Downstream Control Structures

- Improve flexibility in operation





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DATE: 05/24/2022



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**UO MILLPOND
 ENHANCEMENT
 CONCEPT PLAN**

**PROPOSED
 GRADING &
 UTILITIES**

PROJECT NO.:	21018.01	SCALE:	1"=60'
REV.:		BY:	CG
		CHECK:	ML
		DRAWN BY:	

PROPOSED CONDITIONS – PLANTING & HABITAT FEATURES

Emergent Wetland Community

- Diverse combination of obligate wetland species
- No new woody species

Meadow/Prairie Community

- Occupies the area between the wetland community and lawn
- Low-growing species to maintain visual access to water
- No new woody species

Coniferous/Deciduous Tree & Shrub Community

- Located on the north edge of the Millpond
- Provides visual screen of the stockpile areas west of the Central Plant
- Provides filtration of stormwater runoff

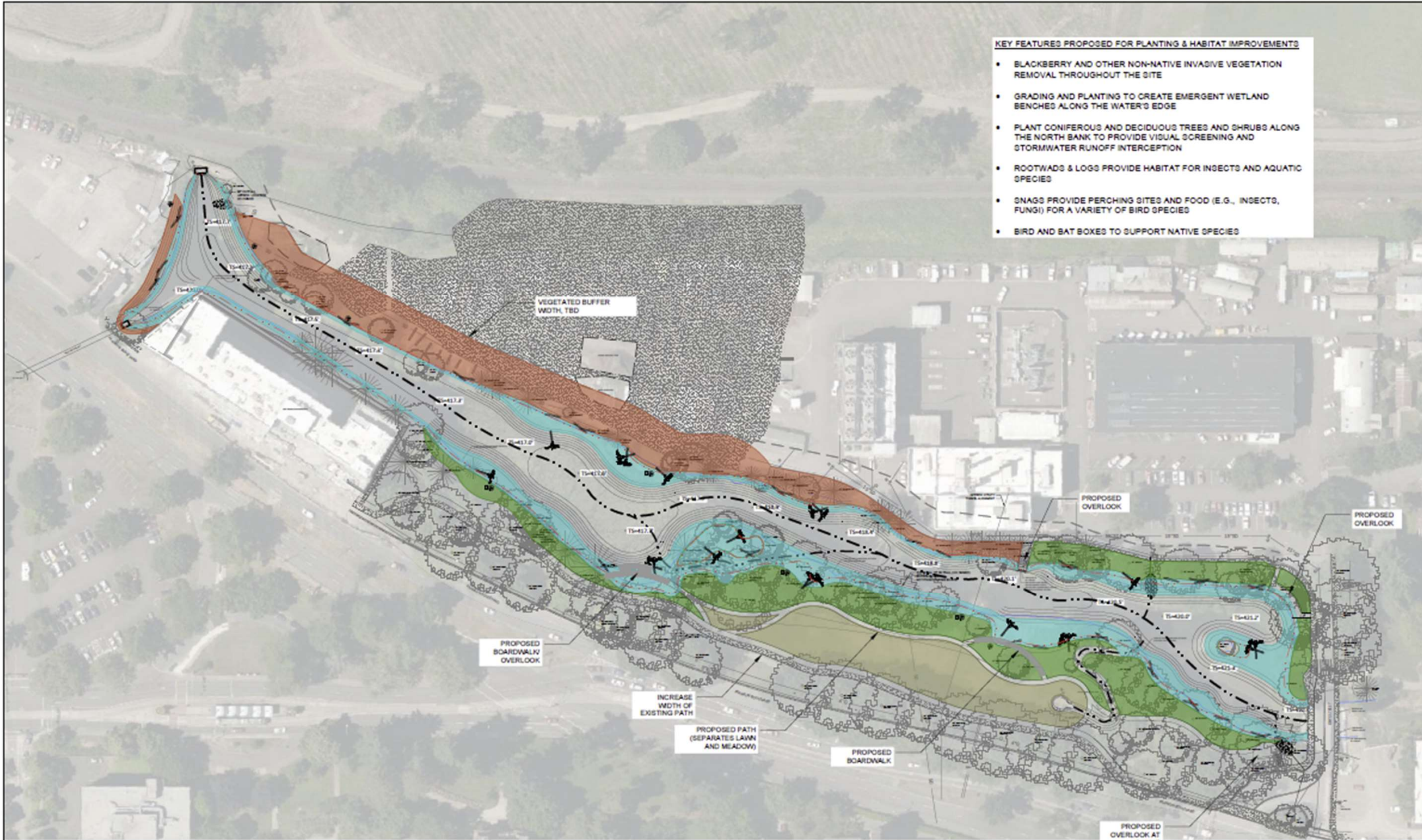
Lawn

- Slightly raise and rehabilitate lawn
- New path creates a separation between the prairie and lawn

Rootwads, logs, snags and bird/bat boxes

- Increase site habitat support, biodiversity
- Contributes to a complex food web





- KEY FEATURES PROPOSED FOR PLANTING & HABITAT IMPROVEMENTS**
- BLACKBERRY AND OTHER NON-NATIVE INVASIVE VEGETATION REMOVAL THROUGHOUT THE SITE
 - GRADING AND PLANTING TO CREATE EMERGENT WETLAND BENCHES ALONG THE WATER'S EDGE
 - PLANT CONIFEROUS AND DECIDUOUS TREES AND SHRUBS ALONG THE NORTH BANK TO PROVIDE VISUAL SCREENING AND STORMWATER RUNOFF INTERCEPTION
 - ROOTWADS & LOGS PROVIDE HABITAT FOR INSECTS AND AQUATIC SPECIES
 - SNAGS PROVIDE PERCHING SITES AND FOOD (E.G., INSECTS, FUNGI) FOR A VARIETY OF BIRD SPECIES
 - BIRD AND BAT BOXES TO SUPPORT NATIVE SPECIES

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DATE: 08/25/2022
 REVISIONS:
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**UO MILLPOND
 ENHANCEMENT
 CONCEPT PLAN**

**PROPOSED
 PLANTING &
 HABITAT**
 PROJECT NO.: 21016.01 SCALE: 1"=50'
 REV: CG CHECK: ML
 DATE: 01/28/2022
 3 OF 4

LEGEND

	EXISTING CONTOUR (1-FOOT INTERVAL)
	PROPOSED CONTOUR
	PROPOSED CHANNEL ALIGNMENT
	EXISTING WATER LEVEL (SURVEYED SEPTEMBER 2021)
	PROPOSED WATER LEVEL

PROPOSED PLANTING LEGEND

	EMERGENT WETLAND COMMUNITY
	TREES AND SHRUBS
	UPLAND MEADOW / PRAIRIE
	ECO-LAWN

PROPOSED HABITAT FEATURES

	ROOTWADS
	LOGS
	WILDLIFE SNAG
	BIRD BOX / BAT BOX



PROPOSED CONDITIONS – VISITOR AMENITIES

Paths

- Widen existing paved path to better support increased traffic through site
- New path closer to the water

Boardwalks

- Allows visitors to observe the biodiversity at the water's edge

Overlooks

- Views at 3 key locations
- Seating

Footbridge

- At existing design-build bioswale

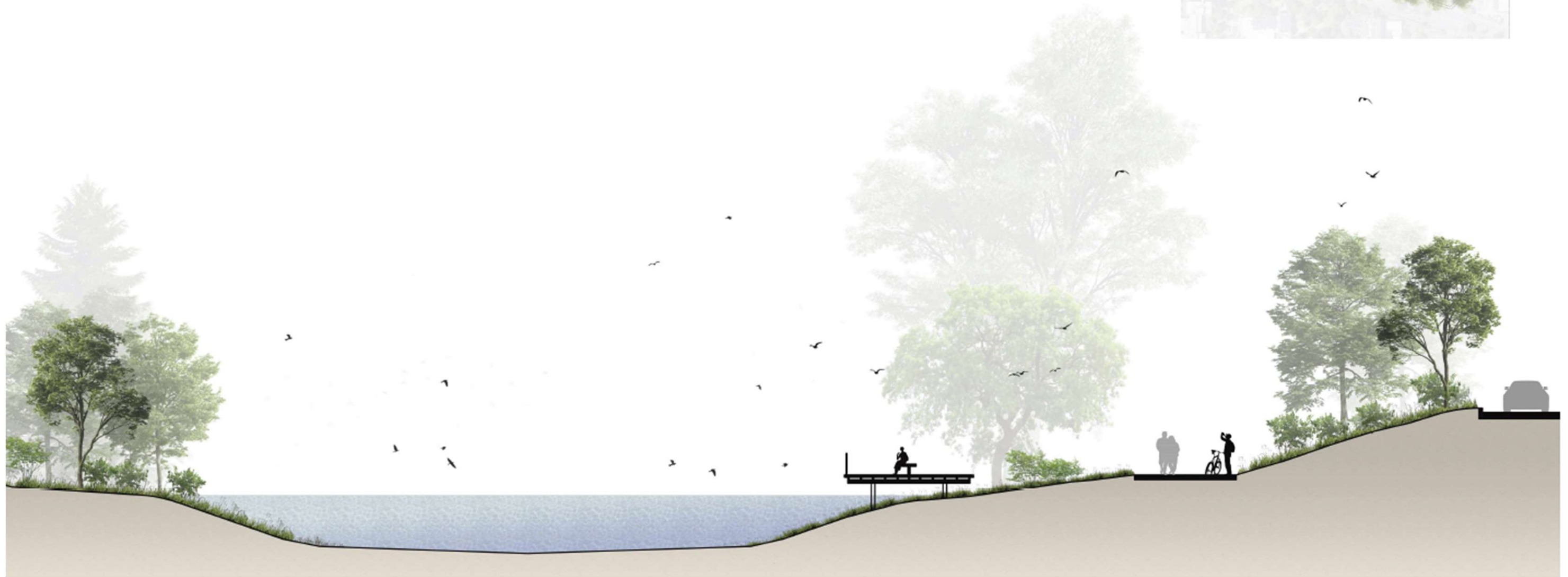
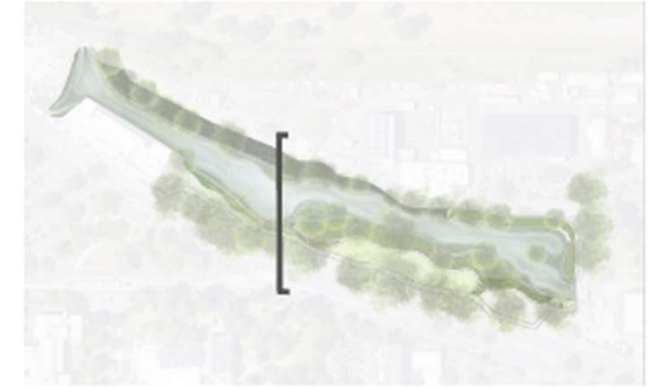


PLAN



- 1. EXPANDED WALK + BIKE PATH
- 2. OVERLOOK
- 3. NEW PATH
- 4. BOARD WALK
- 5. IMPROVED LAWN
- 6. RESTORED MILLRACE POND
- 7. EXISTING TREE
- 8. NEW FOOT BRIDGE

SECTION



WETLAND

POND

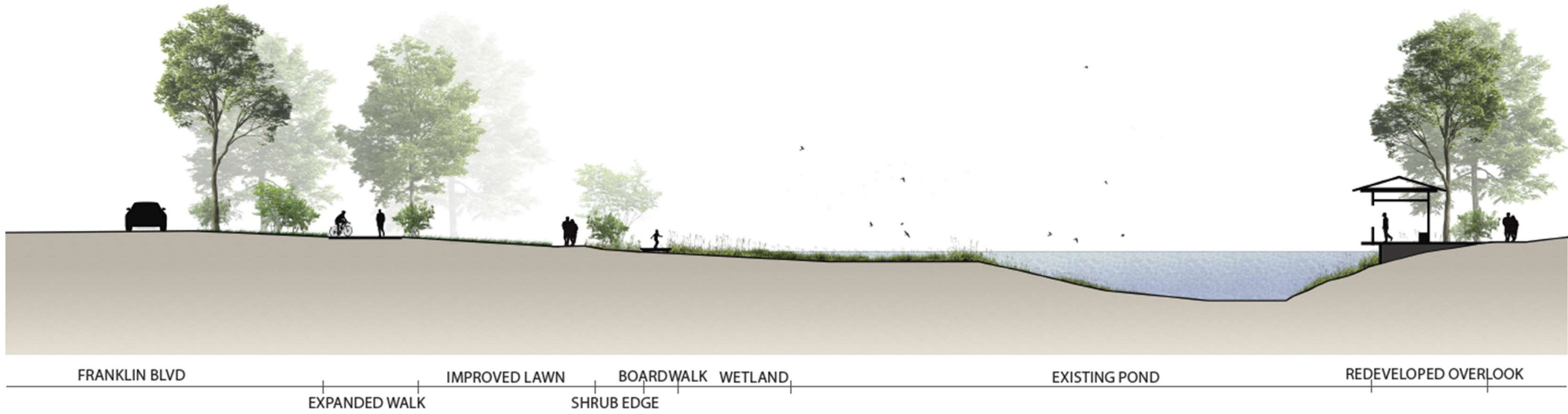
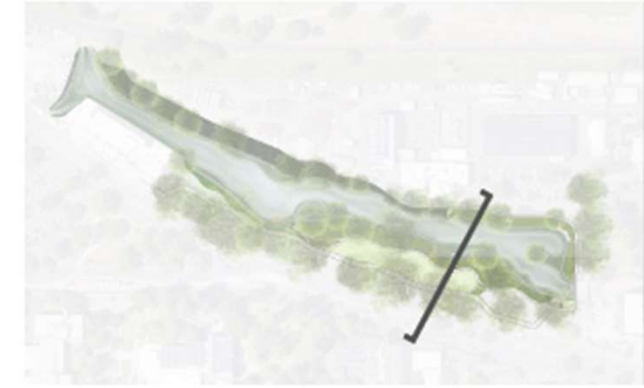
BOARDWALK IN WETLAND

EXPANDED WALK

FRANKLIN
BLVD

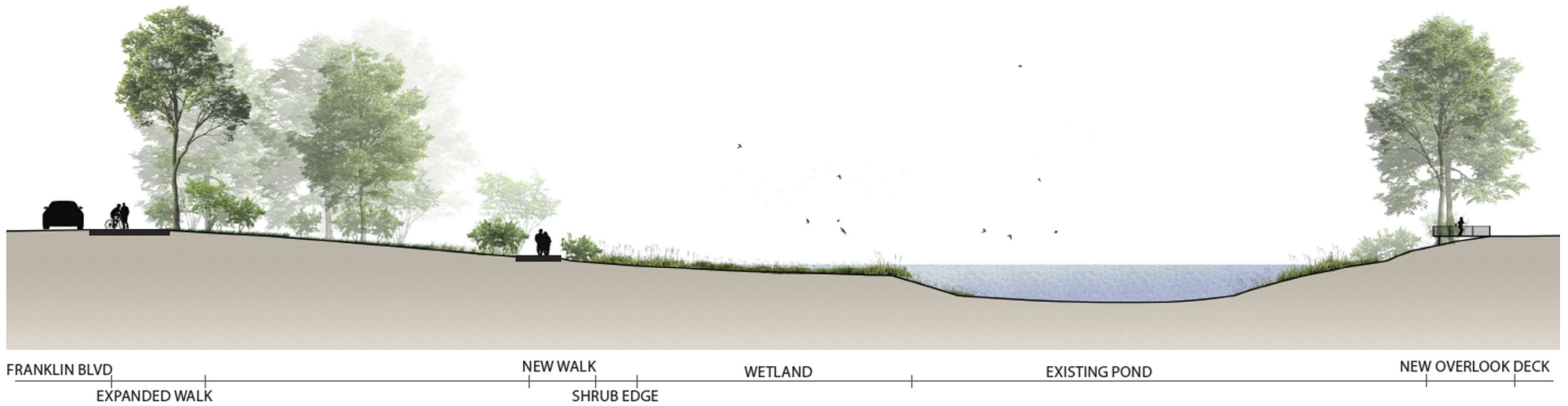
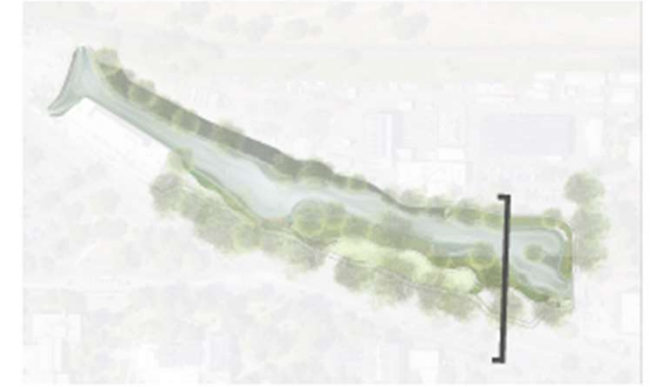
WEST BOARDWALK SECTION 1

SECTION



CENTRAL SECTION

SECTION



CENTRAL SECTION 2

SECTION



INCISED OVERLOOK WITH
STORMWATER SPLASH PAD

REVISED ONYX
INTERSECTION

SPLASH PAD OVERLOOK SECTION



OVERLOOK DECK WITH BIRD
WATCHING SCREEN

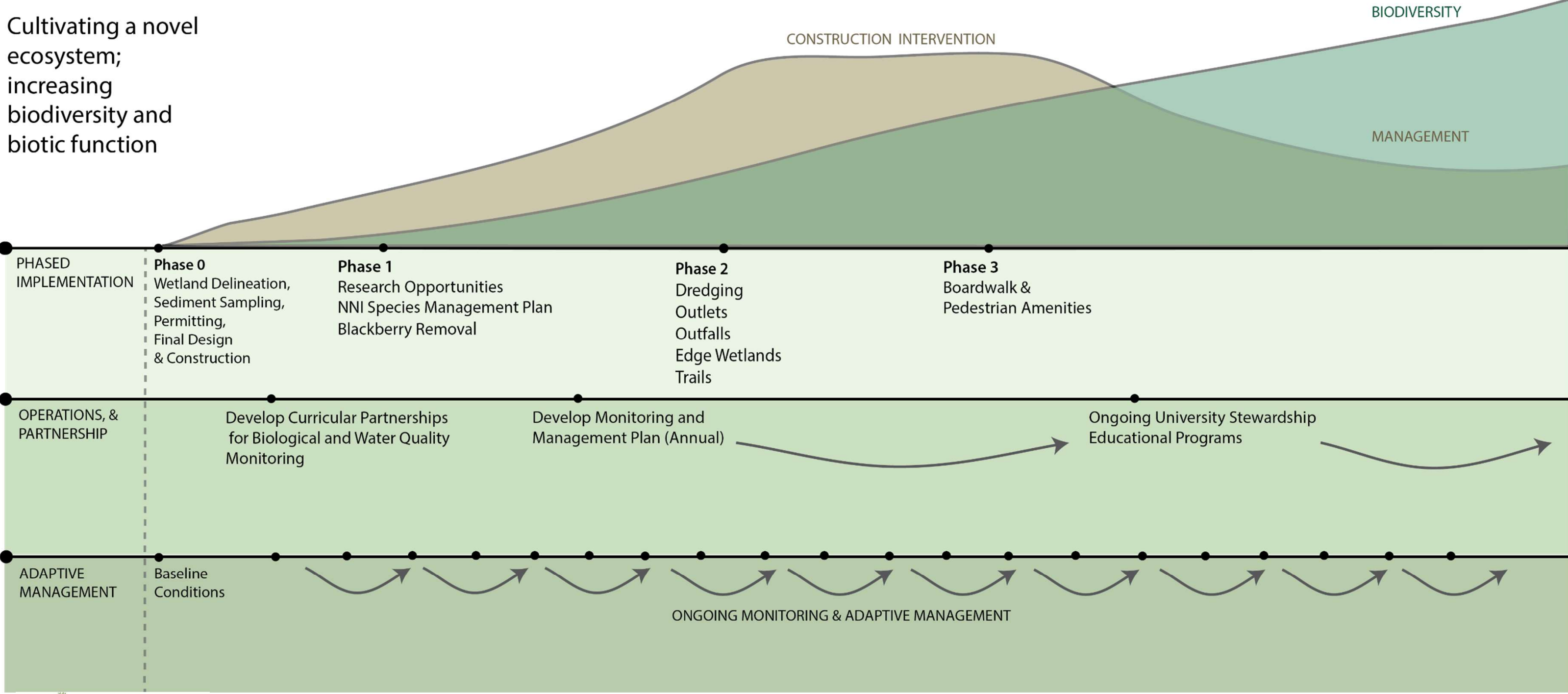
RAMP

ONYX ST AND
SIDEWALK

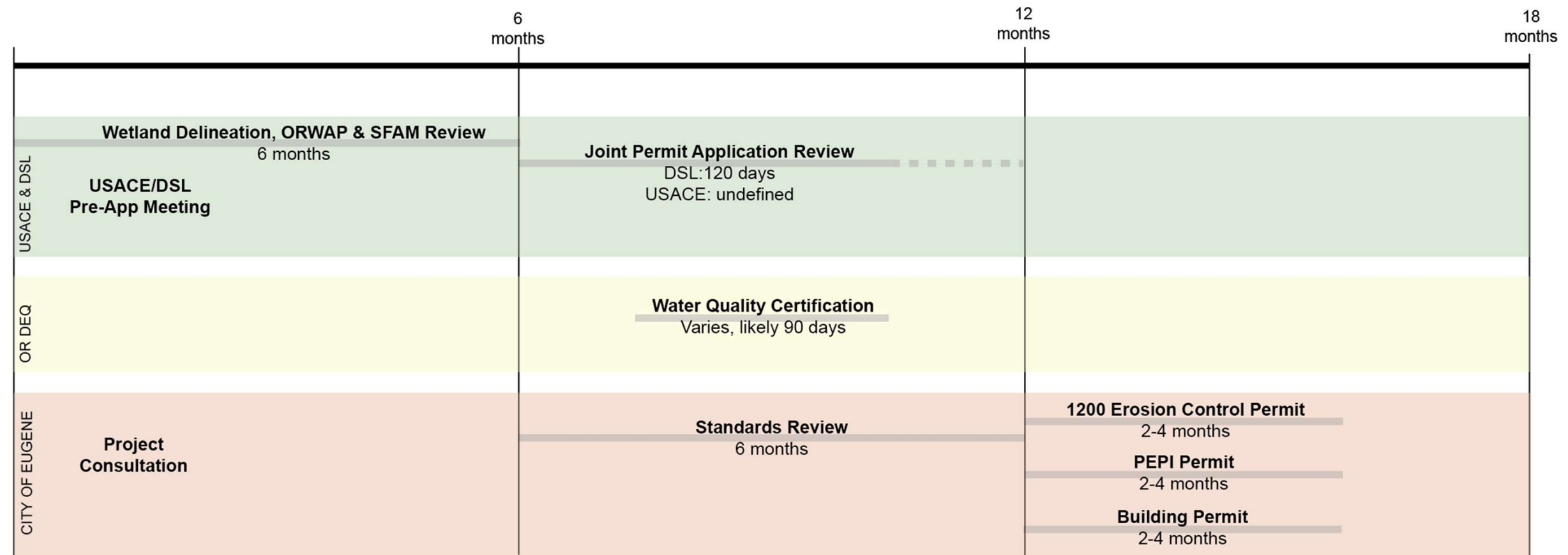
WOOD DUCK OVERLOOK SECTION

UO MILLRACE RESTORATION ECOLOGICAL TRAJECTORY & PHASING

Cultivating a novel ecosystem; increasing biodiversity and biotic function



PERMITTING TIMELINE



ROUGH ORDER OF MAGNITUDE (ROM) COST ESTIMATE

UO Millrace Restoration & Enhancement - Millpond Section		
CONCEPT DESIGN		3/7/2022
Rough order of Magnitude Cost Estimate		
All costs reflect 2022 \$USD and assume a 6-month construction/planting duration (June through November)		
Site Preparation & Earthwork		Assumptions
Mobilization, Clearing, Erosion & Sediment Control, Hydroseeding	\$ 350,000	Summer earthwork, includes survey stakeout, fish salvage. Excludes blackberry/invasives removal.
Diversion & De-watering	\$ 200,000	Includes reconfiguration for replacing outlet structures
Excavation & Imported fill	\$ 600,000	Excludes special handling/disposal if contaminants are present
	\$ 1,150,000	
Stormwater Outfalls		
Daylighting and outfall protection/conveyance at (3) locations	\$ 45,000	Excavation, pipe modifications, rock & cobble, excludes mechanical treatment
Re-grade swale, repair weirs at existing bioswale	\$ 15,000	
	\$ 60,000	
Water Control Structures		
Railroad structure, Sluice Gate	\$ 90,000	Includes gate system & concrete structure replacement/retrofit, excludes screen
Outlet Control Structure at Franklin Culvert	\$ 40,000	Assumes \$20k structure/\$20k for earthwork
	\$ 130,000	
Willamette Intake Pump Replacement		
Replace pumps in-kind, equipment only	\$ 480,000	Excludes modifications to the intake sump
Estimated installation cost, pipes & fittings, markup	\$ 250,000	
	\$ 730,000	
Habitat & Revegetation		
Rootwads, snags, logs & bat/bird boxes	\$ 80,000	
Wetland, meadow/prairie, and tree/shrub communities, & lawn	\$ 150,000	Includes plant protection, excludes maintenance & irrigation
	\$ 230,000	
Site Amenities		
Concrete Walk widening	\$ 100,000	
Trails	\$ 40,000	
Boardwalks and foot bridges	\$ 130,000	
Overlook NW - Vault Top	\$ 30,000	
Overlook NW - Edge of Parking Lot	\$ 30,000	
Overlook NE - Onyx St.	\$ 40,000	
Overlook SE - Splash Pad / Franklin Blvd	\$ 30,000	
	\$ 400,000	
TOTALS		
	CONSTRUCTION SUBTOTAL	\$ 2,700,000
	ROM Contingency %	30%
	Contingency	\$ 810,000
	ROM CONSTRUCTION TOTAL WITH CONTINGENCY	\$ 3,510,000
	Design & Engineering as % of Construction Cost	15% Typically 10-15%, excludes public outreach (unknown frequency)
	Design & Engineering	\$ 526,500
	Wetland Delineation	\$ 20,000 Includes survey of delineation
	Permitting	\$ 40,000 Joint Permit, DEQ, City
	DESIGN, ENGINEERING & PERMITTING	\$ 586,500
	University Costs as a % of Construction Cost	15% Typically 10-15%
	University Soft Costs	\$ 526,500
	ROM DESIGN, PERMITTING & CONSTRUCTION TOTAL	\$ 4,096,500



NEXT STEPS

Wetland Delineation

- Both City & ACOE/DSL permitting require an approved delineation before they can be reviewed
- An approved delineation will help refine the buffer locations (distance from delineated OHW)

Blackberry/NNI Removal

- Clearing invasives before design is finalized may help refine final grading opportunities

Sediment Sampling

- Will support final design/engineering

Water Level Monitoring

- Will support final design/engineering