Boyd, John

From: Roberta Schwarz <roberta.schwarz@comcast.net>
Sent: Wednesday, July 31, 2019 9:50 AM
To: Planning Commission (Public)
Cc: Gary Walvatne
Subject: Testimony and Supporting Documents for August 7th 2019 P.C. Meeting
Attachments: Testimony for the August 7th, 2019 Planning Commission Meeting.pdf

Dear Chair Walvatne and West Linn Planning Commission,

Our Testimony for the August 7th Planning Commission meeting is attached and the supporting documents are all included in the link below. We want to make sure that this gets to you a week in advance so that you will all have time to read the testimony and each of the supporting documents before the August 7th P.C. meeting.

https://drive.google.com/file/d/1zKCvD95B6KKk20MhjZYGXI2fDvMMohxQ/view?usp=sharing

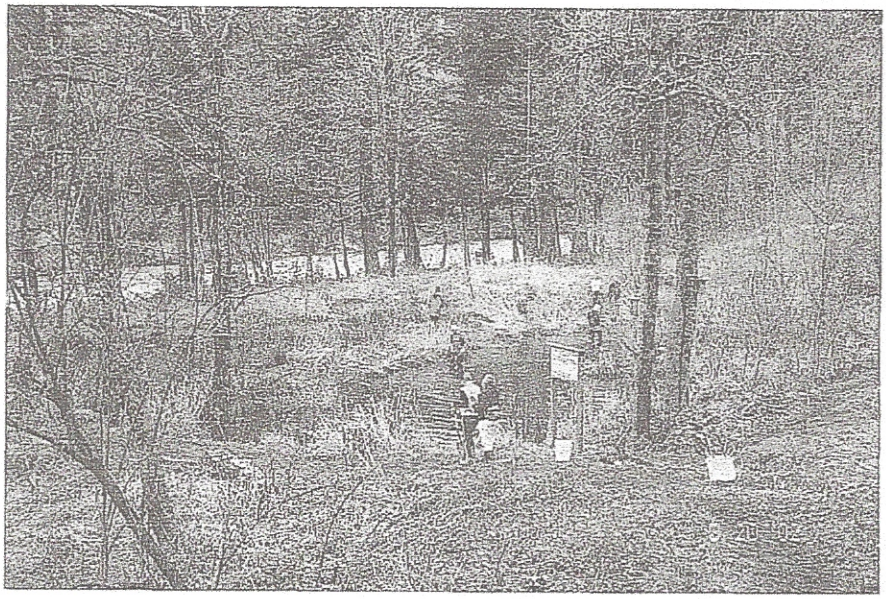
Chair Walvatne, will you please email us to let us know when you have received this email.

Thank you very much,

Ed and Roberta Schwarz
President and Secretary, Savanna Oaks N.A.

City of West Linn

Wetland, Riparian and Wildlife Habitat Inventory



Prepared by

WINTER BROOK
COMMUNITY RESOURCE PLANNING

APPROVED WETLANDS INVENTORY
Oregon Department of State Lands

Meets LWI standards
Date 4/05 Approved by D. Hobbs

Winterbrook Planning

with

Ecotrust
Loverna Wilson and Esther Lev,
Environmental Consultants

February 2003

Topography

The City is situated on a series of terraces and foothills rising west from the banks of the Willamette River and east from the Tualatin River. Ground elevations within the study area vary between 5 feet (mean sea level) along the lower reach of the Willamette River to 760 feet at the top of the hills.

The lowest terrace, which occurs primarily in the Willamette Neighborhood and north of the Interstate 205 bridge, defines the Willamette River floodplain. A series of smaller forested foothills and ravines rise above the floodplain to an elevation of approximately 130 feet (170 feet to the south). A second terrace shelf extends inland to the base of the West Linn hills, which parallels the Highway 43 and Interstate 205 corridors. The hills rise steeply, crossed by numerous small ravines, to an elevation of 400 to 600 feet. Above this elevation, the hills become more rolling in character before reaching the summit along Rosemont Road.

Moderate to steep slopes (greater than 10 percent) make up about 58 percent of the study area, while slopes of 10 percent or less represent only 42 percent. Approximately 15 percent of the study area is comprised of slopes exceeding 25 percent. These slopes are generally located along the steep eastern face of the West Linn ridgeline as well as along some of the city's southern and west-facing slopes.

Hydrology

The Willamette and Tualatin Rivers create the two primary hydrologic basins within the study area. The Willamette River along the eastern edge of the City is the dominant hydrological feature in the study area. The Willamette basin is 11,500 square miles in area and all of the study area is contained within it. The Tualatin River, a tributary to the Willamette, is a prominent feature in the southwestern portion of the study area. The Tualatin River basin is 166 square miles in area, of which approximately 700 acres is located within the West Linn study area. These two rivers join at the southern tip of the study area and together form more than 60 percent of the study area boundary. A significant division of the Willamette River system, into the "Upper" and "Lower" Willamette River, occurs at West Linn's Willamette Falls three miles downstream of the Tualatin River.

Numerous small, perennial streams traverse the slopes of West Linn and discharge to the Willamette and Tualatin Rivers. There are 13 Willamette subwatersheds, each with a stream name designated by the City. They are (listed in order from north to south): Fern Creek, Trillium Creek, Heron Creek, Turkey Creek, Mary S Young Creek, Barlow Creek, Bolton Creek, Maddax Creek, Cascade Springs Pond Creek, McLean Creek, Camassia, Sunset Creek, Tanner Creek, and Bernert Creek.

The streams typically emerge from springs and seeps on the upland terraces and slopes, descending the West Linn hills through steep-gradient ravines before traversing the lowland

terraces and discharging to the River. One additional stream (Fritchie Creek), located in the southwest part of town, is a tributary to the Tualatin River. Approximately 393 acres of Fritchie Creek's 670-acre basin are located within the study area.

Subwatersheds and their sizes within the study area are shown in Table 1.

Table 1. West Linn Subwatersheds and Basin Areas

Subwatershed	Basin Area (acres)
Barlow Creek	201
Bernert Creek	412
Bolton Creek	117
Camassia	219
Cascade Springs Pond Creek	52
Fern Creek	555
Fritchie Creek	393
Heron Creek	123
Maddax Creek	106
Mary S Young Creek	269
McLean Creek	38
Sunset Creek	77
Tanner Creek	659
Trillium Creek	543
Turkey Creek	20
Tualatin River (remaining area)	309
Willamette River (remaining area)	1165
Total	**5258**

The existing drainage system is a combination of natural streams, roadside ditches, culverts, and underground storm drain conduits. The total length of the drainage system is approximately 93 miles, of which approximately 54 percent is piped. Numerous ponds are part of the drainage system, serving a variety of functions. Some ponds were constructed for water quality or quantity benefits, others as aesthetic amenities, and several are naturally occurring wetlands. Although not directly part of the drainage system, two large (14 and 20 acre) aerated settling basins for the West Linn and Blue Heron Paper Companies are prominent water features along the Willamette riverbank in the southern part of the study area.

Geology

Geologic events leading to the formation of the West Linn hills began 16 million years ago during the Miocene period. Volcanic fissures far to the east began discharging hundreds of cubic miles of molten lava that flowed through an ancient Columbia River Gorge, flooding the Willamette River valley. The solidified lava, Columbia River Basalt, covered the Scappoose

The consultant team and City planners also contacted and coordinated with other agencies throughout the Goal 5 process, including:

- City of West Linn (e.g., Planning, Parks, Engineering);
- Clackamas County;
- Metro;
- Oregon Department of Environmental Quality (DEQ);
- Oregon Department of Fish and Wildlife (ODFW);
- Oregon Department of Forestry (DOF);
- Oregon Department of Land Conservation and Development (DLCD);
- State Historic Preservation Office (SHPO);
- The Oregon Natural Heritage Program (ORNHP);
- The Nature Conservancy (TNC);
- U.S. Fish and Wildlife Service (USFWS); and
- West Linn - Wilsonville School District.

Definitions

This section provides a definition of each of the resources addressed in this report (wetlands, riparian corridors, and wildlife habitat) followed by definitions of associated terms, inventory methods and state Goal 5 requirements.

Resource Definitions (from Goal 5 Administrative Rule, Ch. 660, Division 23)

Riparian Corridor – an area along a river, lake, or stream which includes the water areas, fish habitat, wetlands, and adjacent riparian areas that mark the transition from an aquatic ecosystem to a terrestrial ecosystem.

Wetland – an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wildlife Habitat – an area upon which wildlife depend in order to meet their requirements for food, water, shelter, and reproduction.

Other Terms

Basin – a topographical entity within which all the surface water draining to a single point falls; some of the surface water may have come from groundwater fed by geological strata outside the basin.

Mapping Procedures

Field maps were prepared using Year 2001 digital color ortho-photographs at a scale of 1 inch = 200 feet. All data was geo-referenced and registered with the City parcel data in GIS. Information shown on the field maps included property boundaries, rights-of-way with street names, designated open space areas and public lands, map number (and corresponding City Atlas number), hydrologic basin boundaries, topography, hydric soils, streams and City storm system data (detention basins, ponds, ditches, etc), existing wetland data (including digitized DSL and City wetland determinations, NWI wetlands, Wetland Visual Sites (City point data), and 1988 Wetland Study (digitized point data)), and photo-interpreted potential wetland sites.

Wetlands and sample plots were mapped on the field maps. A combination of reference points was used to establish the location and perimeter of each wetland polygon and the location of sample plots. These references included property lines (e.g., survey corner markers), topography (4-foot contours, or less where available), building lines, streets, utilities, trees and other mapped physical features that could be used to determine location and distances on the ground.

Wetland boundaries and sample plots were digitized and registered with the base map in GIS. Inventory maps meeting the requirements of OAR 141-086-0210 and the Digital Map Standards of OAR 141-086-0225 were provided to the City and DSL.

Inventory Results

Forty-four wetlands were identified as part of the Local Wetland Inventory. Wetlands varied in size between 5,000 square feet and 15.5 acres, with a total combined acreage of 72.8 acres. Wetlands were distributed within 10 subwatersheds: Bernert Creek, Camassia, Cascade Springs Pond Creek, Fern Creek, Fritchie Creek, Tanner Creek, Trillium Creek, Turkey Creek, and the remaining portions of the Tualatin and Willamette River basins. Several additional subwatersheds were identified in the study area but did not contain wetlands. Table 3 summarizes the distribution and relative size of wetlands by subwatershed.

Table 3. Wetland Size by Subwatershed

Hydrologic Basin	Basin Area (acres)	Wetland (acres)	Percent wetland in basin
Barlow Creek	201	0.00	0
Bernert Creek	412	0.65	0.2%
Bolton Creek	117	0.00	0.0%
Camassia	219	2.55	1.2%
Cascade Springs Pond Creek	52	1.09	2.1%
Fern Creek	555	4.14	0.7%
Fritchie Creek	393	2.34	0.6%
Heron Creek	123	0.00	0
Maddax Creek	106	0.00	0

Table 6. Wetland Size and Class by Subwatershed

Sub-Watershed	Wetland code	Area (acres)	Cowardin Class			
			PEM	PSS	PFO	POW
Bernert Creek (BE)	BE-01	0.34	0.20		0.14	
	BE-02	0.32	0.15		0.16	
		0.66	**0.35**	**0.00**	**0.30**	**0.00**
Camassia (CA)	CA-01	0.71		0.54		0.18
	CA-02	0.89		0.89		
	CA-03P	0.35	0.35			
	CA-04	0.04*		0.04		
	CA-05	0.14		0.14		
	CA-06	0.42	0.42			
		2.55	**0.77**	**1.61**	**0.00**	**0.18**
Cascade Springs Pond Creek (CS)	CS-01	1.09	1.09			
		1.09	**1.09**	**0.00**	**0.00**	**0.00**
Fern Creek (FE) (incl. Robinwood-RO-tributary)	FE-01	1.52	1.52			
	FE-02	2.33	.26	2.07		
	RO-01	0.29	.05		0.24	
		3.17	**1.83**	**2.07**	**0.24**	**0.00**
Fritchie Creek (FR)	FR-01	1.42	1.42			
	FR-02	0.16	0.13		0.03	
	FR-03	0.35			0.35	
	FR-04	0.41	0.41			
		2.34	**1.96**	**0.00**	**0.38**	**0.00**
Tanner Creek (TA)	TA-01	0.37	0.37			
	TA-02	0.59		0.49	0.10	
	TA-03	0.48		0.48		
	TA-04	0.25		0.25		
	TA-05	1.34	0.53		0.69	0.15
	TA-06	0.18	0.18			
	TA-07	0.69			0.69	
	TA-08	0.39			0.39	
	TA-09	1.58		0.28	1.27	0.03
		5.87	**1.08**	**1.50**	**3.14**	**0.18**
Trillium Creek (TR) (incl. Hidden Springs-HI-tributary)	TR-01	1.59	0.16		1.43	
	TR-02	0.61		0.54	0.07	
	TR-03	2.06	0.30	0.20	1.56	
	TR-04	0.93		0.93		
	HI-01	0.33		0.33		
		5.52	**0.46**	**2.00**	**3.06**	**0.00**
Tualatin River (TU)	TU-01	1.14	1.14			
	TU-02	0.30	0.30			
	TU-03	1.89			1.89	
	TU-04	0.13	0.13			
	TU-05	3.83	3.39		0.44	

Bernert Creek (BE)

Table 7. OFWAM Wetland Assessment Results

Wetland code	Area (acres)	Wildlife Habitat	Fish Habitat	Water Quality	Hydrologic Control	Sensitivity to Impact	Enhancement Potential	Education	Recreation	Aesthetic Quality
BE-01	0.337	some	impacted degraded	intact	impacted degraded	potentially sensitive	high opportunities	not appropriate	potential	moderately pleasing
BE-02	0.316	some	impacted degraded	intact	impacted degraded	potentially sensitive	high opportunities	not appropriate	potential	moderately pleasing
CA-01	0.714	diverse	N/A	impacted degraded	impacted degraded	potentially sensitive	N/A	educational	recreational	moderately pleasing
CA-02	0.887	some	N/A	not present	intact	potentially sensitive	moderate	educational	recreational	moderately pleasing
CA-03P	0.346	some	N/A	impacted degraded	impacted degraded	potentially sensitive	little	educational	recreational	pleasing
CA-04	0.041	some	N/A	not present	intact	potentially sensitive	moderate	educational	recreational	pleasing
CA-05	0.141	some	N/A	not present	intact	potentially sensitive	moderate	potential	recreational	pleasing
CA-06	0.421	some	impacted degraded	impacted degraded	impacted degraded	potentially sensitive	high opportunities	potential	not appropriate	pleasing
CS-01	1.09	some	impacted degraded	impacted degraded	impacted degraded	potentially sensitive	high opportunities	not appropriate	potential	moderately pleasing
FE-01	1.518	some	impacted degraded	not present	lost	potentially sensitive	moderate	not appropriate	not appropriate	moderately pleasing
FE-02	2.332	diverse	intact	impacted degraded	impacted degraded	potentially sensitive	N/A	potential	potential	moderately pleasing
FR-01	1.424	some	intact	impacted degraded	impacted degraded	potentially sensitive	high opportunities	not appropriate	not appropriate	not pleasing
FR-02	0.162	some	impacted degraded	impacted degraded	intact	potentially sensitive	high opportunities	not appropriate	not appropriate	pleasing
FR-03	0.349	some	impacted degraded	impacted degraded	impacted degraded	potentially sensitive	high opportunities	not appropriate	not appropriate	moderately pleasing
FR-04	0.409	some	impacted degraded	impacted degraded	intact	potentially sensitive	high opportunities	not appropriate	not appropriate	not pleasing

Table 8 summarizes the relative distribution of assessments for each function and condition, with the percentage of total wetlands ranking high in each category.

Table 8. Wetland Assessment Results for the Study Area

Function / Condition	High	Moderate	Low	N/A	% Wetlands Assessed High
Wildlife habitat	6	38	0		14%
Fish habitat	8	26	0	10	18%
Water quality	3	35	6		7%
Hydrologic control	20	21	3		45%
Sensitivity to impact	2	41	1		5%
Enhancement potential	26	11	1	6	59%
Education	14	10	20		32%
Recreation	18	14	12		41%
Aesthetic quality	7	28	9		16%

Each wetland was assessed to determine whether it should be considered a Wetland of Special Interest for Protection (WSIP). The questions in the WSIP category cover the presence of federal or state listed species and habitats, existing local, state or federal protections, and existing management plans. The following wetlands were found to be WSIP wetlands: TU-01 (red-legged frog breeding site) and CA-01 through CA-05 (part of Nature Conservancy's Camassia Preserve).

During field investigations, no vacant, former wetlands of five acres or larger in size were identified. Therefore, no potential wetland mitigation or restoration sites were noted in the LWI.

Significant Wetlands Determination

In Oregon, local government planning responsibilities include the determination, designation, and protection of significant wetlands. Wetlands are considered significant if the OFWAM evaluation determines that they:

1. provide diverse wildlife habitat, intact fish habitat, intact water quality function, or intact hydrologic control function;
2. are located within 1/4-mile of a "water quality limited stream" and have "intact" or "impacted or degraded" water quality function;
3. contain rare plant communities or federal or state-listed species; or
4. have a surface water connection to a stream that is habitat for indigenous anadromous salmonids and have "intact" or "impacted or degraded" fish habitat function.

As noted above, the City of West Linn chose to apply the two optional significance criteria:

1. wetlands that represent a locally unique native plant community; or
2. wetlands that are publicly owned and have educational uses.

A total of 38 wetlands met the criteria and were determined to be significant. These wetlands generally had 1) high wildlife or fish habitat, water quality, or hydrologic control function, 2) a surface water connection to a salmonid stream, or 3) were located within 1/4-mile of a water quality limited stream. Approximately one-half (20) of the significant wetlands were less than one-half acre in size. The six wetlands not meeting the criteria were:

- FE-01
- HI-01
- TA-06
- TA-07
- TA-08
- TU-04 (stormwater swale created from upland, excluded)

need access to water, and all species need some amount of cover while drinking at a water source. However, habitat assessments are also intended to reflect the needs of the types of species that would be expected to occur within the habitat site. Thus, an upland habitat site without on-site water may outscore a riparian site in some cases, by providing highly rated forage or nesting habitat for certain species, or the presence of rare species or habitats (e.g., a remnant oak savanna). The proposed WHA method, as adapted for West Linn, provides an assessment approach that adds greater emphasis on the value of natural communities, particularly those that are rare or threatened.

Significance Determination

Wildlife habitat significance was determined based on several factors, including the WHA rating and the presence of listed or rare species. A habitat site is significant if it:

- Receives a Wildlife Habitat Assessment score of 45 points or more;
- Receives a Wildlife Habitat Assessment score of 30 to 44 points and provides a linkage between other significant Habitat Sites, Riparian Corridors, or Wetlands;
- Provides habitat for a wildlife species listed by the federal government as a threatened or endangered species or by the state of Oregon as a threatened, endangered, or sensitive species;
- Supports locally rare species or habitats (e.g., remnant Oak Savanna habitat);
- Is documented (by a state or local resource agency) as a sensitive bird nesting, roosting, or watering resource site for osprey, great blue herons, or other species;
- Is documented to be essential to achieving policies or population objectives specified in a wildlife species management plan adopted by the Oregon Fish and Wildlife Commission; or
- Is identified and mapped by the Oregon Fish and Wildlife Department as habitat for a wildlife species of concern and/or as a habitat of concern.

Inventory Results

Twelve habitat sites ranging in size from 39 to 323 acres were identified during the wildlife habitat inventory. Most sites were associated with streams or rivers and included riparian corridors and/or wetlands.

Table 11 summarizes the size, general boundaries, and associated wetland and riparian sites for habitat sites within the West Linn study area. The sites are organized alphabetically by site name.

Table 11. Summary of Wildlife Habitat Sites

Habitat Site	Habitat Code	Acres	Site boundaries	Wetland Sites	Riparian Reaches
Camassia/ Wilderness Park	CA-H-1	135	I-205 and Maple Ave (south), Prospect St (west), Skyline Dr (north), and West A St (east)	CA-01 – CA-06	CA-R-1
Fritchie Creek	FR-H-1	68	Interstate 205 north to study limits (UGB) and east to vicinity of Bland Circle; includes 2 sub-areas	FR-01	FR-R-1 FR-R-2
Lower Fern Creek	FE-H-1	49	N. City limits south to Lower Fern Creek along old River Dr. – Willamette River west to Hwy 43.	FE-02	AR-R-1 RO-R-1 FE-R-1
Lower Trillium Creek	TR-H-1	70	Bordered to east by Willamette River and Calaroga Dr., west by Hwy. 43, south by Mapleton Dr., north by city limits	TR-04 TR-03	GA-R-1 RN-R-1 TR-R-1
Mary S. Young / Willamette Lowlands	MA-H-1	323	Willamette near Calaroga Dr. south to lower MS Young Cr. – Willamette River west to Hwy 43.	WI-04 WI-05 WI-06 TY-01	HE-R-1 MA-R-1 TY-R-1 WI-R-1 WI-R-2
Mary S. Young/ Upper Trillium Ridge	MA-H-2	150	Hidden Springs Rd, south to Webb St. – Hwy 43 west to Rosemont Rd.	TR-01 TR-02 HI-01	TR-R-2 HE-R-2 MA-R-2 BA-R-2
Tanner Creek	TA-H-1	110	Rosemont Rd. (north), Interstate 205 (south), Summit and Sussex Streets (east); west boundary near Salamo Rd.	TA-1 – TA-09	SA-R-1 TA-R-1 TA-R-2
Tualatin River	TU-H-1	137	Confluence of Willamette and Tualatin north west to Fritchie Cr.	TU-01 through TU-05, FR-02, FR-03, FR-04	TU-R-1 TU-R-2 FR-R-1 FR-R-2
Upper Bernert Creek	BE-H-1	39	Tannler Drive (west), Haskins Road (north), and I-205 south		BE-R-1
Upper Fern/ Skyline Ridge	FE-H-2	165	North city limits south to Hidden Springs Rd., Hwy. 43 west to city limits	RO-01, FE-01	AR-R-1 RO-R-1 FE-R-2 RN-R-2
Upper Willamette / Wetland Complex	WI-H-2	265	Bordered on the east by Willamette River, west by I-205, south by Tualatin River (Willamette Park), north by Willamette Falls.	WI-01, WI-01a, WI-02, WI-03, BE-01, BE-02	BE-R-1 TA-R-1 WI-R-3 WI-R-4
Willamette Falls / Clackamas Confluence	WI-H-1	247	Lower Barlow Creek south to Willamette Falls, south of Interstate 205 and east of Hwy 43; includes Goat Island	CS-01, WI-07	BA-R-1 BO-R-1 CS-R-1 MC-R-1 MX-R-1 WI-R-2

Of Which the White Oak Savanna is approximately 20 acres

Upper Bernert Creek

This is a relatively small site in the upper Bernert Creek basin distinguished by having a small remnant oak savanna/grassland habitat. A mixed Douglas fir/bigleaf maple forest is located northeast of the oak community. The upper Bernert Creek corridor continues south of Salamo Road through maple and oak dominated forest before reaching I-205. Residential neighborhoods border and bisect the site, and I-205 is located to the south. Habitat types include Mixed Conifer/Hardwood Forest (12 acres), Hardwood Forest (8 acres), Oak Savanna (4.5 acres), and Mixed Shrub/Herbaceous (13.5 acres). The site provides forage, cover, and nesting habitat for a variety of wildlife including species associated with oak communities such as band tailed pigeon (a federal Species of Concern).

Upper Fern Creek / Skyline Ridge

Forested north-south ridge and associated stream corridors located in the Skyline Ridge, Marylhurst and Hidden Springs neighborhoods above Highway 43. Hillside streams (some fish-bearing) emerge from seeps and springs and flow through steep ravines dominated by Douglas fir, bigleaf maple, and occasionally Oregon white oak. This forest links the multiple ravines along the steep ridge above residential areas along Hwy. 43. This sites includes a locally rare Oregon ash-slough sedge-common camas wetland at the new City park at Upper Midhill Drive. A variety of open space lands are part of the site, including the Arran (1 acre), Carriage Way (6 acres), Interstate Tractor (11 acres), Skye Parkway (8 acres), Troon (6 acres), and Wildwood (13 acres) Open Spaces. This site contains moderate to high quality upland, riparian and wetland habitats. Habitat types include Conifer Forest (45 acres), Mixed Conifer/Hardwood Forest (82 acres), Hardwood Forest (18 acres), Oak Woodland (7 acres), Mixed Shrub/Herbaceous (7 acres), Meadow/Grassland (1 acre), with Palustrine Forested (1 acre) and Emergent (1 acre) wetlands.

Upper Willamette / Wetland Complex

The Upper Willamette / Wetland Complex Site is located along a wide and relatively undifferentiated reach of the Willamette River between the Tualatin River confluence and Willamette Falls. The confluence area, with its linkage to Site TU-H-1 and larger habitats to the west, provides important habitat functions; however, the major habitat feature of the site is a forest, scrub-shrub and emergent wetland complex linked to Bernert Creek forests and the Willamette River. This habitat area, located along the floodplain terrace between Willamette Park and the West Linn Paper lagoon, comprises the largest wetland complex in the City, totaling approximately 27 acres. The high interspersion of wetland types, with forested ash wetlands and diverse scrub-shrub and open water areas, is also unique to the City. State and federally listed species (both plant and animal) occur within the site. Other habitat features include snags and large woody debris, which occur in greater abundance than at many other sites. Two paper company settling basins border high quality wetland habitat. These area offer potential wetland restoration and enhancement opportunities. Habitat types include Bottomland Forest (32 acres), Conifer Forest (9 acres), Mixed Conifer/Hardwood Forest (1 acre), Hardwood Forest (10 acres), Oak Woodland (23 acres), Shrub (23 acres), Mixed Shrub/Herbaceous (2 acres), and Meadow/Grassland (2 acres). Wetlands include Palustrine Forested (10 acres),

Habitat Site	Habitat Code	Acres	WHA Score	Enhanced Score	Special Features
Mary S. Young / Willamette Lowlands	MA-H-1	323	90	96	Pileated woodpecker, little willow flycatcher; Winter steelhead, Coho salmon, Chinook salmon; Large habitat mosaic
Mary S. Young/ Upper Trillium Ridge	MA-H-2	150	70	78	Bandtailed pigeon, live-sided flycatcher Potential amphibian breeding sites Ash forested wetlands
Tanner Creek	TA-H-1	110	58	67	Pileated woodpecker; fish
Tualatin River	TU-H-1	137	87	92	Bald eagle, band-tailed pigeon, little willow flycatcher, pileated woodpecker Red legged frog Winter steelhead, coho salmon
Upper Bernert Creek	BE-H-1	39	50	58	Remnant oak savanna; band-tailed pigeon
Upper Fern Creek/ Skyline Ridge	FE-H-2	165	72	79	olive-sided flycatcher, pileated woodpecker, ash-sedge-camas wetland fish-bearing stream
Upper Willamette / Wetland Complex	WI-H-2	265	82	89	White rock larkspur; Bald eagle, bandtailed pigeon, pileated woodpecker; Steelhead, coho salmon, chinook salmon; River confluence/Willamette Falls Wetland complex
Willamette Falls/Clackamas Confluence	WI-H-1	247	86	93	Bald eagle, olive-sided flycatcher, peregrine falcon, pileated woodpecker; Steelhead, coho salmon, chinook salmon; Major confluence/habitat mosaic Heron Rookery

Significant Habitat Determination

Wildlife habitats were determined to be significant based on the WHA score for each site, the presence of federal or state-listed species, the presence of locally rare species or habitats, and other criteria described above. All 12 habitat sites met the WHA threshold criteria, and several sites also were found to support federal or state-listed species or locally rare species or habitats.

West Linn Goal 5 Inventory
Riparian Corridor Summary Sheet

Riparian Site/Reach: Bernert Creek
Location: Willamette River to Johnson Dr.
T2S, R1E, Sec: 35, 36; T3S, R1E, Sec: 01, 02 **Atlas map #:** 5431-3, 5531-3
LWI wetland codes: BE-01, BE-02, W1-03
Habitat sites: WI-H-4, BE-H-1
Adjacent Land Use: freeway, office, residential

Riparian Code: BE-R-1
Basin: Upper Willamette
Reach Length: 6527'
Photos: 1720
Field Date(s): 4/22/02
Investigators: TB, LW

General Comments
Upper Bernert follows I-205 embankment and is highly disturbed until it crosses Willamette Falls Drive, where it enters a forested ravine and meets wetland W1-03.

Riparian Characteristics

Stream type/order: perennial, first order
Dom. soil type: Cove Silty Clay Loam
Soil erosion potential: ☒ low ☐ medium ☐ high
WQ limited? ☐ yes ☒ no Parameters: _____
Floodplain? ☐ yes ☒ no Source: _____
Fish-bearing stream? ☐ yes ☒ no (potential)
Fish barriers: culverts (drops)
Road density: 1 crossing per 1305 linear feet
Large wood features: small amounts, several pools
Recruitment potential: ☒ low ☐ medium ☐ high

Channel type: moderate gradient moderately confined channel
Gradient: ☐ low (<2%) ☒ mod (2-4%) ☐ mod steep (>4%)
Side slopes: ☐ <10% ☐ 10-20% ☒ 20-50% ☐ >50%
Active channel width: 2-6' depth: 1'
Channel width - valley width ratio: varies, >1:1.5
Vegetated riparian width: 0-200'
Stream flow: ☐ none ☒ low ☐ medium ☐ high (rivers)
Channel shade: ☐ <25% ☒ 25-50% ☐ >50%
Bank/channel condition: deeply incised sections
Other water resources: ☐ ponds ☒ wetlands ☒ springs

Notes: lots of chorus frogs, potential fish access to lower reach from Willamette River

Vegetation (*dominant)

Trees	60% cover	Shrubs	60% cover	Herbs/Emergents	90% cover
Oregon ash* (wet.)	Ornamental cherry	Himal. blackberry*	Vine maple	Reed canary grass* (wet.)	Fireweed
Big-leaf maple*	Black hawthorn	Scot's broom	Osoberry	Tall fescue	Lady fern
Douglas fir*	Red alder	Willow (wetland)	Sitka elderberry	Sweet vernal grass	Stinging nettle
Black cottonwood (36")	Pacific madrone	Pacific ninebark	Hazelnut	Velvet grass	Cleavers
Western red cedar		Snowberry	Red-osier dogwood	Sword fern	Bracken fern
Oregon white oak				English ivy (in trees)	Scot's broom
	90% Native		30% Native		25% Native

Assessment Results:

Riparian Function	Rating			Comments
Water Quality	☐ Low	☒ Medium	☐ High	
Water Sources and Storage	☐ Low	☒ Medium	☐ High	
Fish Habitat	☒ Low	☐ Medium	☐ High	
Wildlife Habitat	☒ Low	☐ Medium	☐ High	
Sensitive Species	☒ Low	☐ Medium	☐ High	
Combined score:	38			

Significant? ☐ Yes ☒ No **Basis:**

Restoration/Enhancement Opportunities: Restore vegetative buffer in upper section; add native tress, shrubs and herbaceous layer.

West Linn Goal 5 Inventory
Wildlife Habitat Assessment Summary

General Information

Habitat Site: Upper Bernert Creek
Habitat code: BE-H-1
Location: Upper Bernert Creek bordered by Tannler Drive (west), Haskins Road (north), and I-205 (south)
Site size: 39 acres
Atlas #: 5332, 5431, 5432
Sub-basin: Bernert Creek
LWI wetlands: N/A
Field date(s): 4/22/02, 6/27/02
Riparian sites: BE-R-1
Investigators: TB, LW, AK
WHA Score: 50 **Enhanced Score:** 58

Site Summary

This is a relatively small site in the upper Bernert Creek basin distinguished by having a small remnant oak savanna/grassland habitat. A mixed Douglas fir/bigleaf maple forest is located northeast of the oak community. The upper Bernert Creek corridor continues south of Salamo Road through maple and oak dominated forest before reaching I-205. Residential neighborhoods border and bisect the site, and I-205 is located to the south. Habitat types include Mixed Conifer/Hardwood Forest, Hardwood Forest, Oak Woodland, and Mixed shrub/herbaceous. The site provides forage, cover, and nesting habitat for a variety of wildlife including species associated with oak communities such as band tailed pigeon (federal Species of Concern).

COMPONENT		DEGREE			SCORE	ENHANCED	COMMENTS
WATER	QUANTITY AND SEASONALITY	NONE 0	SEASONAL 4	PERENNIAL 8	4	4	limited water sources within site
	QUALITY	LOW 0	MEDIUM 4	HIGH 8	4	4	
	PROXIMITY TO COVER	NONE 0	NEAR 4	ADJACENT 8	4	4	
	DIVERSITY (TYPES)	NONE 0	ONE 2	TWO 4 THREE+ 6	2	2	Bernert Creek
FOOD	QUANTITY AND SEASONALITY	NONE 0	LIMITED 4	YEAR ROUND 8	5	6	add seed, berry-bearing species
	VARIETY	LOW 0	MEDIUM 4	HIGH 8	4	6	revegetate/diversify invasive dominated areas
	PROXIMITY TO COVER	NONE 0	NEARBY 4	ADJACENT 8	5	6	
COVER	STRUCTURAL DIVERSITY	LOW 0	MEDIUM 4	HIGH 8	4	5	add shrubs, mid-canopy layer
	VARIETY AND SEASONALITY	LOW 0	MEDIUM 4	HIGH 8	3	5	diversify species mix
	NESTING AND DENNING SITES	NONE 0	LIMITED 2	YEAR ROUND 4	2	2	
	ACCESS/ ESCAPE	LOW 0	MEDIUM 2	HIGH 4	2	2	
HUMAN DISTURB.	PHYSICAL (habitat alteration)	HIGH 0	MEDIUM 2	LOW 4	2	3	housing and roads, invasive species (manage, revegetate with natives)
	ACTIVITY (traffic, trash, pets)	HIGH 0	MEDIUM 2	LOW 4	1	1	continuous freeway noise, residential activity/traffic, pets
INTERSPERSION/ CONNECTIVITY		LOW 0	MEDIUM 4	HIGH 8	2	2	
WILDLIFE FEATURES	RARITY OF HABITAT TYPE	NONE 0	RARE 4	UNIQUE 8	4	4	remnant oak savanna
	FLORA	NONE 0	RARE 4	UNIQUE 8	0	0	
	FAUNA	NONE 0	RARE 4	UNIQUE 8	2	2	band tailed pigeon

West Linn Goal 5 Inventory
Wildlife Habitat Assessment Summary – Site BE-H-1

Vegetation (*dominant)

Trees		Shrubs		Herbs/Emergents	
Oregon white oak*	Pacific madrone	Himal. blackberry*	Red elderberry	Tall fescue*	Lady fern
Big-leaf maple*	Red alder	Hazelnut	Snowberry	Reed canary grass	Stinging nettle
Douglas fir*	Western red cedar	Osoberry	Vine maple	Bracken fern	Sword fern
Black cottonwood		Pacific ninebark		Cleavers	Velvet grass
Black hawthorn		Red-osier dogwood		English ivy	
Ornamental cherry		Scot's broom		Fireweed	

Wildlife Observed

Birds			Reptiles/Amphibians	Mammals
Band tailed pigeon	Scrub jay			
Black-capped chickadee	Song sparrow			
American goldfinch	Violet green swallow			
Oregon junco				

Special Features

Habitat/Species	Status/Disposition	Remarks
Remnant oak savanna	One of few remaining groves	Hills above Salamo Road
Band tailed pigeon	Federal SoC / - / ONHP list 4	Vicinity of oak grove

Assessment Results

Component/Factor	Rating	Component/Factor	Rating
Water	Medium	Disturbance	Medium
Food	Medium	Connectivity	Low
Cover	Medium	Unique Features	Low
Score: 50	**Enhanced score: 58**	**Significant?**	**Yes**

HERRERA

Exhibit 2

TECHNICAL MEMORANDUM

Date: March 27, 2017

To: Roberta Schwartz

From: Abbey Rhode, PE

Subject: Bernert Creek Daylighting Preliminary Feasibility and Cost Analysis

BACKGROUND

Bernert Creek is a tributary to the Willamette River that historically flowed southward along what is now Tannler Drive and then east to the river. Around 1977, the creek was piped as part of a stormwater drainage network to support development. Neighbors for a Livable West Linn (NLWL) and the Trust for Public Land partnered together for over 12 years to raise$3.5 million and acquire 20 acres of property along and adjacent to the historical creek to preserve ecologically important oak savanna. The park is now a public West Linn Park, owned by the City of West Linn, and officially called The White Oak Savanna. Thousands of volunteer hours, including many classes of students, have volunteered to help restore the site. There is now an opportunity to "daylight" the segment of Bernert Creek that runs along the preserved oak savanna to further enhance the ecological and educational benefits of this important park.

As shown in Figure 1, the existing pipe alignment along the proposed stream channel daylighting corridor consists of a 24-inch concrete pipe (BER6-7) that connects an upstream manhole structure (BEJ7) to a downstream manhole structure (BEJ6). The pipe is approximately 900 feet long with a slope of 0.128 feet/foot (West Linn Public Works 2006).

PROPOSED STREAM CHANNEL DAYLIGHTING

Description

A proposed conceptual alignment for the daylighted stream channel is shown in Figure 1. The upstream end of the new/restored channel would be near structure BEJ7 via a new outfall that discharges piped flow to the channel. The channel would extend southward along the forested area east of Tannler Drive, and at its downstream end would convey flow into a pipe coincident with the existing pipe alignment at or near structure BEJ6 via a new ditch inlet structure. One pedestrian bridge and one drivable culvert crossing would provide public access to the West Linn Oak Savanna along the length of the channel. These crossings would encourage access to the stream to serve as a public demonstration of ecological restoration, and could readily

include interpretive signage to educate visitors on the benefits of stream habitat on water quality and fish.

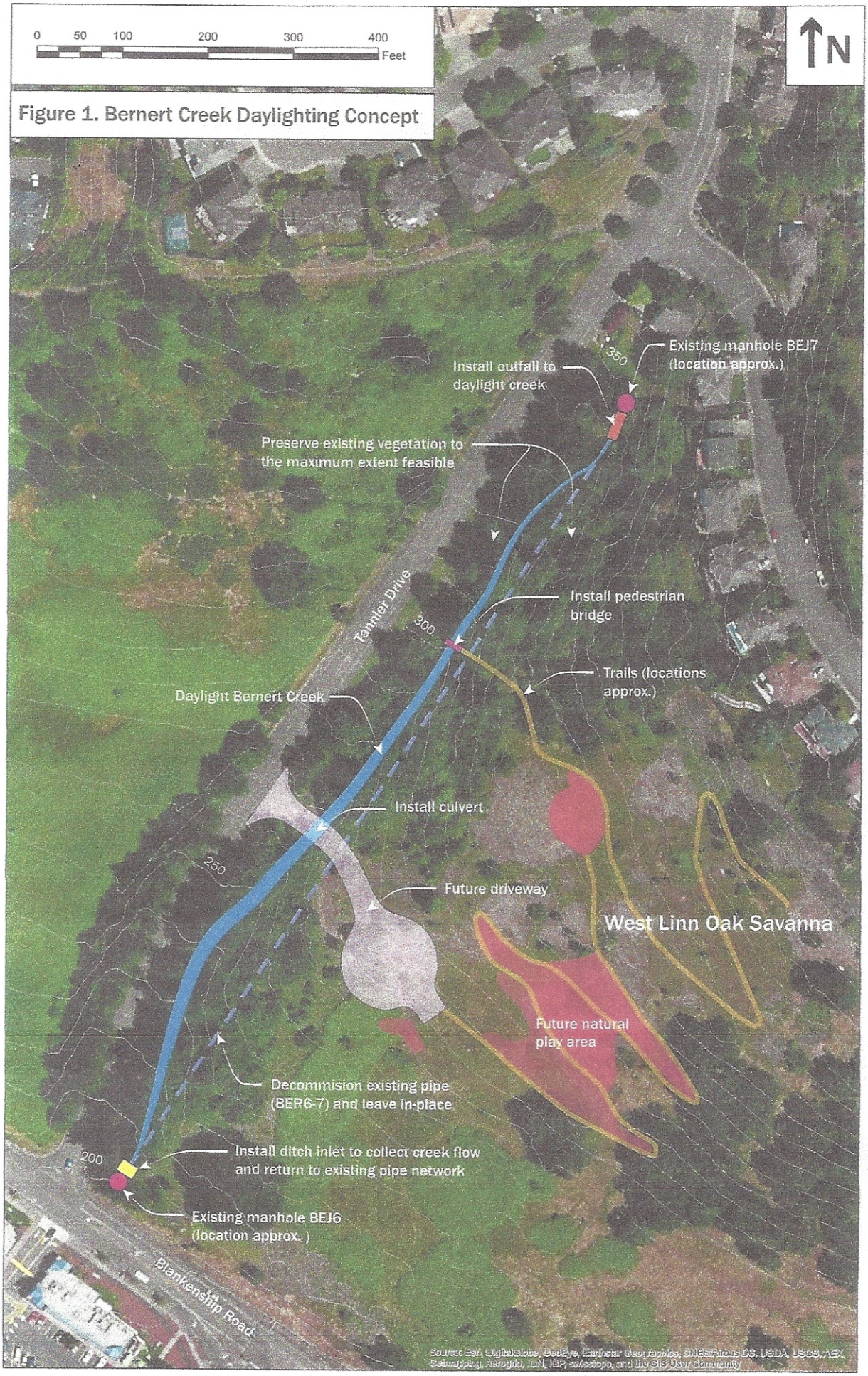
Provided that adequate freeboard is achievable (i.e., additional channel depth above estimated peak flow levels), the proposed concept would decommission the existing BER6-7 pipe and leave it buried in place to reduce cost. One possible design alternative would be to instead retain the pipe for functional flow conveyance, with a new overflow structure or a flow splitter installed in structure BEJ7 that would direct flow into the pipe during high storm flows. Diverting higher flows into the existing pipe could help to minimize the potential for an extreme storm event causing damage to the new/restored channel habitat, though the overflow structure or flow splitter included in this alternative would require an added level of inspection and maintenance attention for the long term to be sure it continues to function as intended.

Benefits

Land development in the Bernert Creek watershed impacts fish habitat downstream by increasing water temperatures and increasing peak storm flows that can erode and otherwise adversely affect fish habitat. Daylighting and enhancing the creek channel would provide shade and increase hyporheic interaction with the soil to decrease water temperatures. While it is assumed that the creek historically provided habitat for salmonid fish species, existing downstream barriers to fish passage are likely preventing access for these species in the oak savannah site area. In addition, a well-designed channel would provide much more hydraulic roughness than the existing concrete pipe in which Bernert Creek flows, which would slow down flow velocities and provide a modest amount of peak flow attenuation, thereby providing a minor benefit for downstream portions of the creek system.

The proposed channel alignment currently provides a valuable habitat corridor for a wide range of wildlife species. Over 100 vertebrate species have been identified on the property (Mishaga 2014) and it has been estimated that daylighting of the creek would substantially increase the species diversity even further (Mishaga 2013), providing a unique opportunity for residents and visitors to encounter these rarer species in their community setting. As development in the Portland Metro Area continues at a rapid pace to meet the demands of an increasing population, preserved habitats such as the West Linn Oak Savannah are increasingly important to provide vital habitat, and the refuge it provides, for local wildlife.

West Linn Oak Savannah is a preeminent example of how the community can be involved to increase education and awareness of local habitat. One goal for this stream channel daylighting project would be to serve as an accessible demonstration site to educate the community on the importance of healthy streams and the many important functions of riparian corridors. Most visitors to the oak savannah would enter and/or exit via a route over the creek, where interpretive signage could be placed for their benefit. In addition, many classes of children participate in volunteer efforts at the park and this would be an opportunity for children to learn about the stream in a safe, easily accessible environment.


0 50 100 200 300 400
Feet
N
Figure 1. Bernert Creek Daylighting Concept
Existing manhole BEJ7 (location approx.)
Install outfall to daylight creek
350
Preserve existing vegetation to the maximum extent feasible
Tannler Drive
300
Install pedestrian bridge
Trails (locations approx.)
Daylight Bernert Creek
Install culvert
250
Future driveway
West Linn Oak Savanna
Future natural play area
Decommision existing pipe (BER6-7) and leave in-place
Install ditch inlet to collect creek flow and return to existing pipe network
200
Existing manhole BEJ6 (location approx.)
Blankenship Road
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Feasibility and Design Recommendations

Feasibility considerations for daylighting Bernert Creek amid the oak savannah area include conveyance capacity for flood prevention and site constraints. This memo is intended to provide an overview of feasibility considerations. Further analysis is recommended to inform design.

The hydraulic feasibility analysis for this memo is based on hydrologic modeling completed by the City of West Linn in 2006 (West Linn Public Works 2006), which included analysis of hydraulic capacity needs for watershed "build-out" conditions. The City's report calculated peak storm flow rates at the upstream and downstream drainage structures shown on Figure 1. Table 1 lists the results. However, it should be noted that when this analysis was conducted, West Linn Oak Savannah was zoned for development, and so the calculated build-out flows were likely based on the assumption that many of the preserved areas in the savannah would have included more impervious area than will now be the case. Thus, the City's peak flow estimates are slightly higher than they would have been if their modeling work accounted for the site as a park space instead of another form of land development.

Table 1. Bernert Creek Drainage Structure Storm Peak Flow Estimates[a]

Storm Frequency	BEJ7 (upstream structure)		BEJ6 (downstream structure)	
	2006	Build-out	2006	Build-out
2-Year	7.45	7.93	18.48	18.89
5-Year	8.82	11.13	22.97	23.43
10-Year	9.49	13.98	25.16	25.68
25-Year	15.15	23.67	31.64	33.62
50-Year	17.42	26.00	33.36	37.90
100-Year	20.59	29.57	35.88	44.19
500-Year	25.55	34.04	40.04	54.58

[a] Hydrologic modeling performed with HEC-HMS with detention facilities (West Linn Public Works 2006).

Topographic survey was not available for this area, but the information on the existing pipe alignment enables a good estimate of the overall slope of the stream. Due to the steep slopes in the area, it is estimated that an approximate channel cross section area would need to be a minimum of 7.5 square feet to meet conveyance requirements and provide freeboard to prevent flooding of adjacent ground. For the purpose of developing a planning-level cost estimate, a simplified trapezoidal cross section was assumed with a base width of 2 feet, a depth of 1.5 feet, and a bank full width of 8 feet. However, it is recommended that the channel design not be a uniformly simple trapezoidal geometry, incorporating lateral and vertical (deeper than 1.5 feet) variation and complexity as space allows for increased habitat value. Where feasible, the channel should be allowed to spread as much as possible within a floodplain to distribute energy. The potential stream corridor width is estimated to range between 30 and 50 feet, which should be more than adequate for peak flow conveyance purposes, however, it would result in a narrow riparian corridor between the creek and the road in some places. It is recommended that the

riparian understory be actively maintained to supplement solar shading in areas where the canopy is narrow.

The primary constraints for this project are the steepness of the site and construction access due to the existing native vegetation on the site, which should be preserved to the maximum extent feasible. The overall daylighted channel slope would be approximately 12% on average, which is steep relative to most other stream channels in the region. Due to the steepness, it is recommended that the stream design incorporate grade control elements to prevent large scale erosion and channel bed incision. However, the steepness of the channel would be consistent with the historical channel character. The soils along the proposed daylighting alignment are mapped as part of the Witzel series, which are characterized by slopes up to 40 percent and have a depth to bedrock of 12 to 20 inches (NRCS 2017). This soil type is resistant to long-term erosion. However, grade control may be required in areas where native bedrock was excavated and disturbed during the installation of the pipe alignment, in the form of large boulder weirs, log weirs, and/or placing larger boulders and cobbles throughout the length of the channel, to prevent incision. Depending on the way in which grade control is accomplished, this could greatly impact the overall cost of construction, as well as increase the overall construction impact. Hydraulic modeling of the corridor should be conducted to determine the extent of grade control required, and to aid in sizing grade control components. Furthermore, hydraulic roughness (via cobbles and boulders and/or large woody debris) and vegetation will be important for minimizing erosion at the site following construction. As mentioned previously, if high flows are diverted into the existing pipe then the need for grade control and hydraulic roughness would be somewhat lessened.

Construction access to the site would occur via Tannler Road, which runs alongside the proposed creek corridor. The planning-level cost estimate prepared to accompany this memo includes costs for traffic control. Project construction may require temporary closures of one lane of traffic on Tannler Road. Most of the proposed stream corridor contains mature, native vegetation. Both the design and construction of the creek should be targeted to minimize impacts to established native vegetation along the creek corridor. Significant trees and vegetation should be surveyed along the full width of the future riparian corridor to inform design and identify high priority preservation areas. Construction techniques should include use of low ground pressure equipment and fencing of protected root zones.

32.020 APPLICABILITY

A. This chapter applies to all development, activity or uses within WRAs identified on the WRA Map. It also applies to all verified, unmapped WRAs. The WRA Map shall be amended to include the previously unmapped WRAs.

B. The burden is on the property owner to demonstrate that the requirements of this chapter are met, or are not applicable to the land, development activity, or other proposed use or alteration of land. The Planning Director may make a determination of applicability based on the WRA Map, field visits, and any other relevant maps, site plans and information, as to:

1. The existence of a WRA;

2. The exact location of the WRA; and/or

3. Whether the proposed development, activity or use is within the WRA boundary.

In cases where the location of the WRA is unclear or disputed, the Planning Director may require a survey, delineation, or sworn statement prepared by a natural resource professional/wetland biologist or specialist that no WRA exists on the site. Any required survey, delineation, or statement shall be prepared at the applicant's sole expense. (Ord. 1623 § 1, 2014)

H. Daylighting Piped Streams.

1. As part of any application, covered or piped stream sections shown on the WRA Map are encouraged to be "daylighted" or opened. Once it is daylighted, the WRA will be limited to 15 feet on either side of the stream. Within that WRA, water quality measures are required which may include a storm water treatment system (e.g., vegetated bioswales), continuous vegetative ground cover (e.g., native grasses) at least 15 feet in width that provides year round efficacy, or a combination thereof.

2. The re-opened stream does not have to align with the original piped route but may take a different route on the subject property so long as it makes the appropriate upstream and downstream connections and meet the standards of subsections (H)(3) and (4) of this section.

3. A re-aligned stream must not create WRAs on adjacent properties not owned by the applicant unless the applicant provides a notarized letter signed by the adjacent property owner(s) stating that the encroachment of the WRA is permitted.

4. The evaluation of proposed alignment and design of the reopened stream shall consider the following factors:

   a. The ability of the reopened stream to safely carry storm drainage through the area without causing significant erosion.

   b. Continuity with natural contours on adjacent properties, slope on site and drainage patterns.

   c. Continuity of adjacent vegetation and habitat values.

   d. The ability of the existing and proposed vegetation to filter sediment and pollutants and enhance water quality.

   e. Provision of water temperature conducive to fish habitat.

5. Any upstream or downstream WRAs or riparian corridors shall not apply to, or overlap, the daylighted stream channel.

6. When a stream is daylighted the applicant shall prepare and record a legal document describing the reduced WRA required by subsections (H)(1) and (5) of this section. The document will be signed by a representative of the City and recorded at the applicant's expense to better ensure long term recognition of the reduced WRA and reduced restrictions for the daylighted stream section.

U.S. Fish and Wildlife Service

National Wetlands Inventory

NWI West Linn OR, Bernert Creek 1 to 9k

Exhibit 4

March 18, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Exhibit 5

CITY OF West Linn
PLANNING AND DEVELOPMENT

STAFF REPORT
FOR THE PLANNING COMMISSION

DATE: August 16, 2017

FILE NO.: DR-17-04

REQUEST: Class II Design Review to add a nature play playground to the White Oak Savanna Park.

PLANNER: Jennifer Arnold, Associate Planner

Planning Manager JB

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out.of the playground area which is to be constructed in an open sloped field.

COMMUNITY DEVELOPMENT CODE

CHAPTER 30 WETLAND AND RIPARIAN AREA PROTECTION

30.100 Approval Criteria

A. The Planning Director or Planning Commission, as applicable, shall make findings with respect to the following criteria when approving, approving with conditions, or denying an application. The provisions of the following chapters shall be met as applicable:

1. **Chapter 27, Flood Hazard Construction.**
2. **Chapter 28, Willamette River Greenway.**
3. **Chapter 29, Tualatin River Bank Control.**
4. **Chapter 32, Natural Drainageway Protection. (ORD. 1425)**

Response: The subject site is not located within the 100-year flood plain or within proximity to the Willamette or Tualatin Rivers, or any natural drainageways. Therefore, there are no applicable sections of Chapters 27, 28, 29 or 32.

B. Alternatives which avoid all adverse environmental impacts associated with the proposed action shall be considered first. For unavoidable adverse environmental impacts, alternatives which reduce or minimize these impacts shall be selected.

Response: There are no adverse environmental impacts associated with this site. Additional runoff from added hard surfaces will be collected and treated in a bioswale/raingarden, and remain on site with a possible use of irrigation. In addition, the parking area is planned to be constructed with permeable concrete, asphalt or pavers.

30.130 Construction and Management Plan

A. A construction plan shall be developed, including timetables and assurances for performance; and,

Response: The City plans to begin construction of the playground this summer with completion by the end of this same summer of 2017. Further construction such as sidewalks along Tannler Drive, Blankenship Rd. and Salamo Rd. may take place as additional funding or other steps to implement the TSSP in that area take place. A more detailed construction management plan shall be developed and submitted to the City of West Linn in conjunction with the City's review of construction documents.

B. A management plan shall be developed for ongoing monitoring and maintenance, including assurances for performance.

Response: The proposed Oak Savannah Playground will be included in the City's Park Maintenance Management System and therefore, ongoing monitoring and maintenance will be up to the City.

C. Assurances shall be established to rectify any mitigation actions which are not successful. This may include bonding or other surety.

Exhibit 6