Yelm Highway Community Park Master Plan

Appendix

September 7, 2022

Olympia
Parks • Arts • Recreation
Experience It!

PARTNERSHIP
berger

Table of Contents

A. Public Survey Results

SURVEY SUMMARY

A SURVEY WAS CONDUCTED ON THE FUTURE COMMUNITY PARK ON YELM HIGHWAY.

THE SURVEY WAS OFFERED TO ATTENDEES OF THE PARKS SEPTEMBER 18TH OUTREACH MEETING.

THE SURVEY WAS OFFERED ONLINE AT THE ENGAGE OLYMPIA WEBSITE FROM

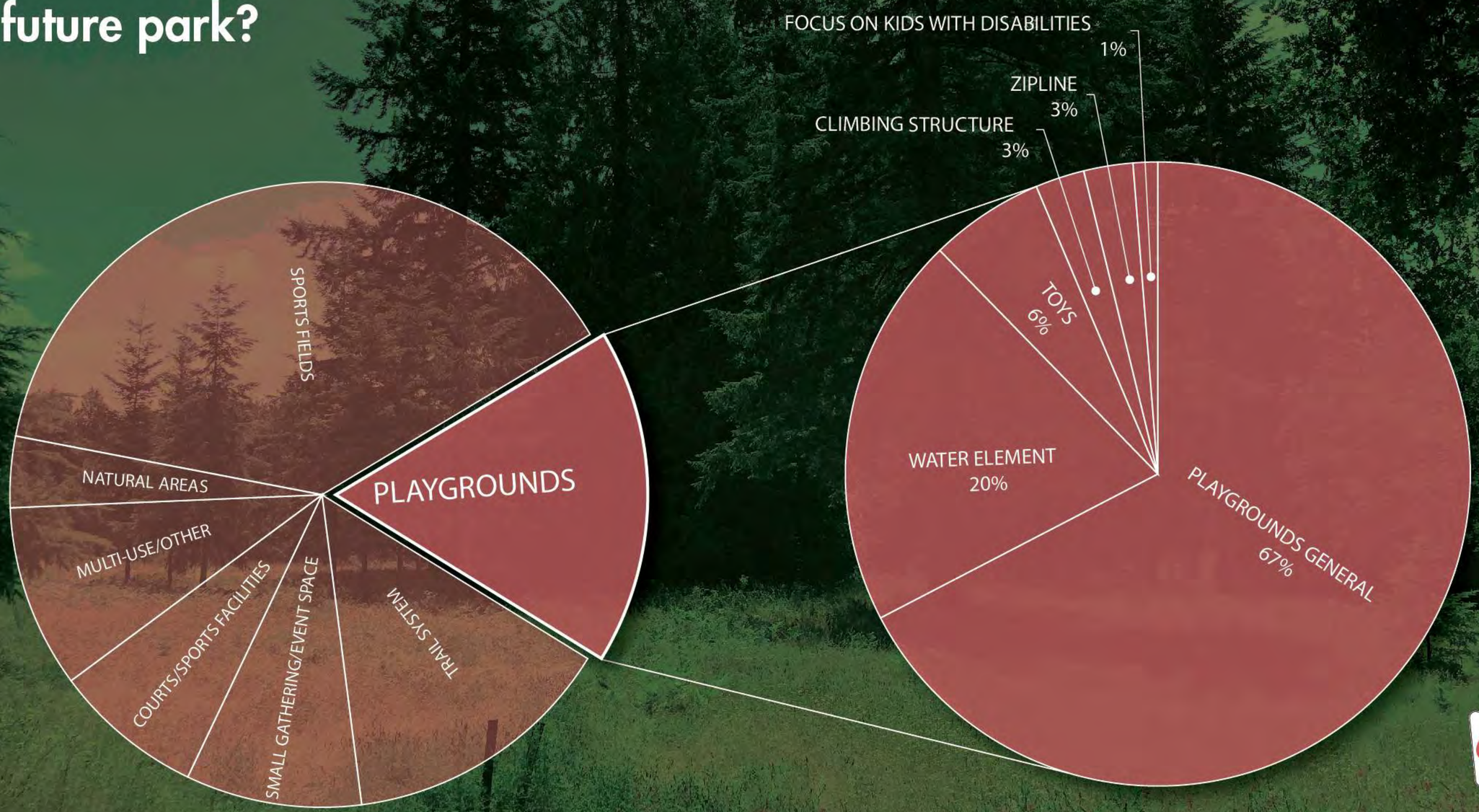
THE FOLLOWING IS A SUMMARY OF THE SURVEY RESULTS.

SURVEY SUMMARY

SURVEY QUESTION #1:What types of park features and activities would you most like to see at this future park?

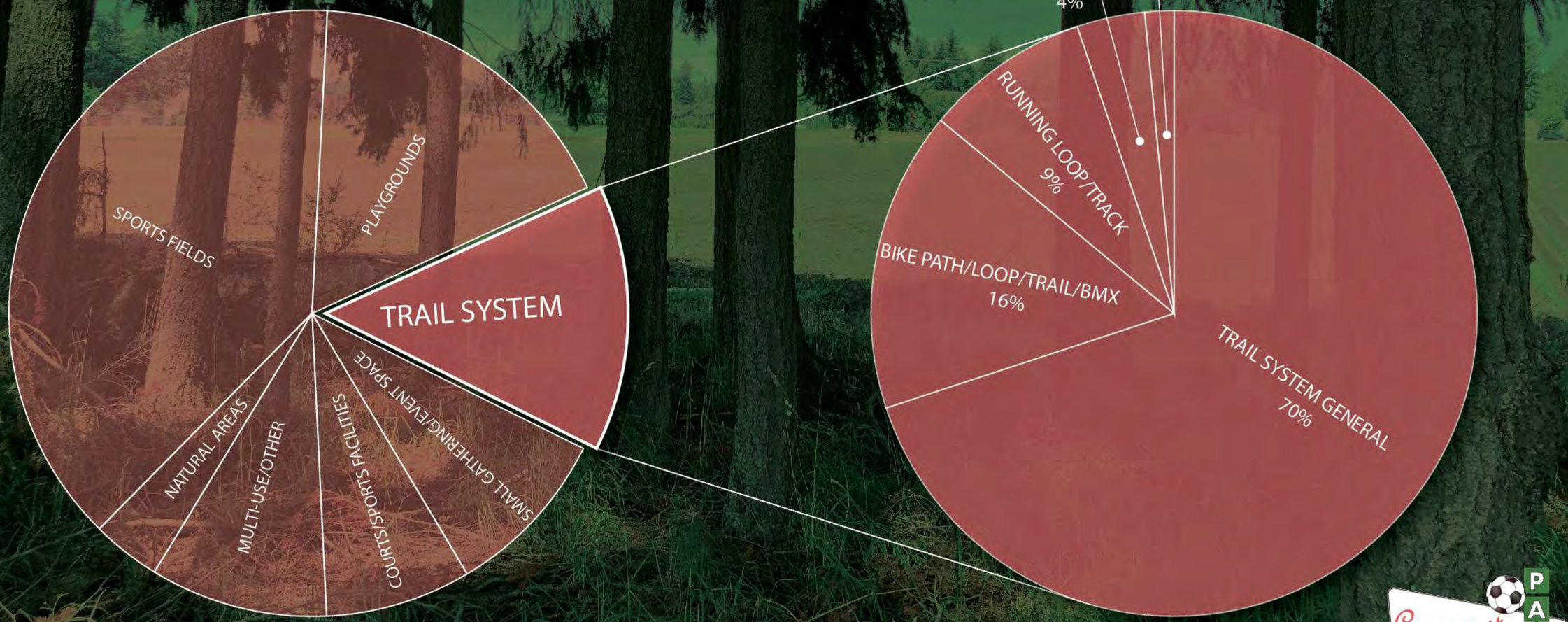
SURVEY SUMMARY

SURVEY QUESTION #1:What types of park features and activities would you most like to see at this future park?



SURVEY SUMMARY

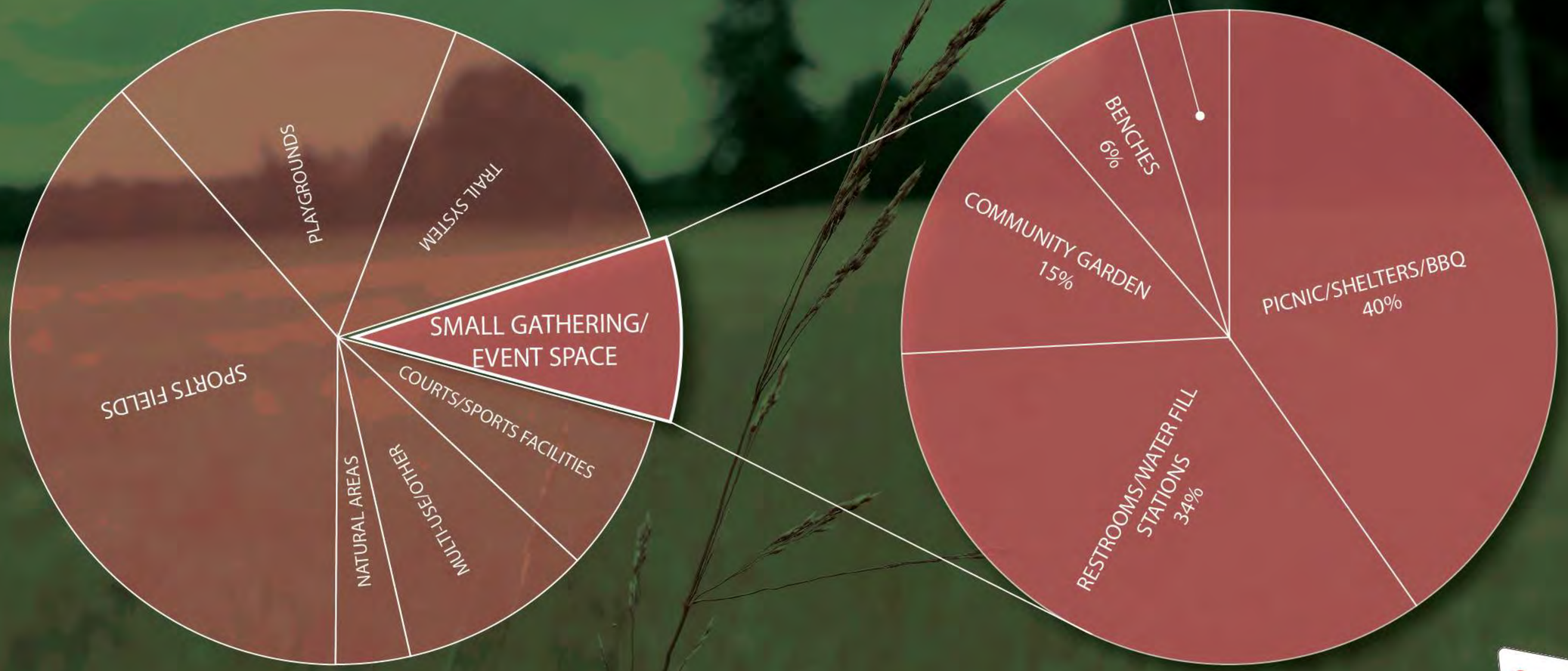
SURVEY QUESTION #1:What types of park features and activities would you most like to see at this future park?



Community PARK
IDEAS WANTED!

SURVEY SUMMARY

SURVEY QUESTION #1:What types of park features and activities would you most like to see at this future park?

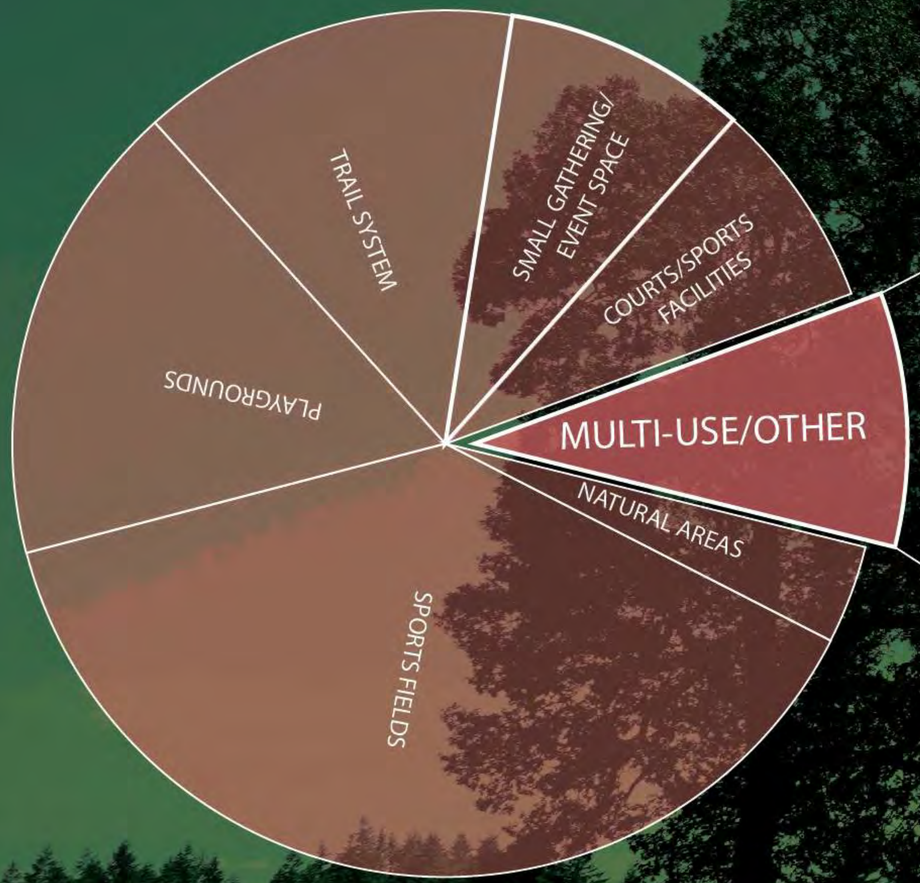


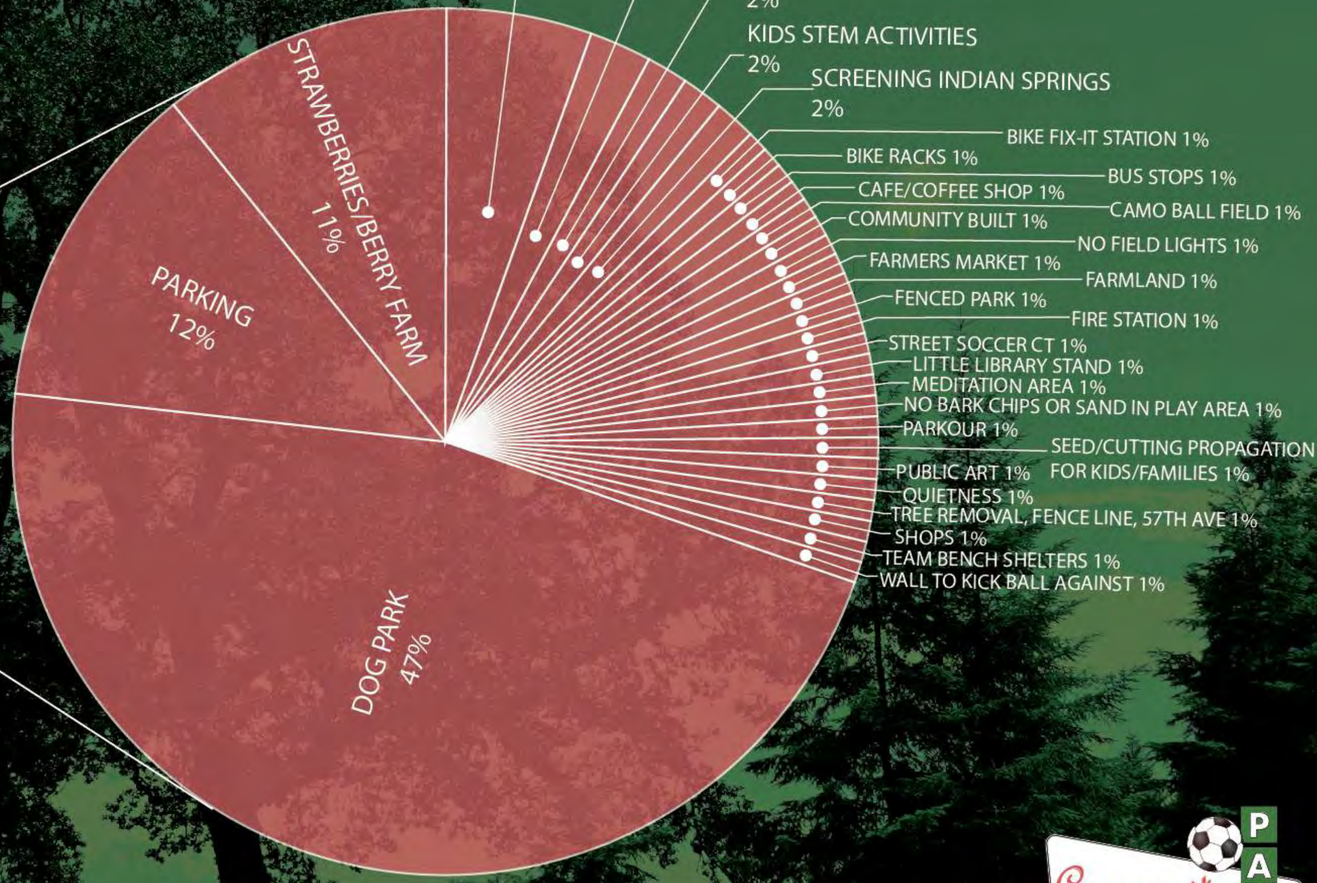
SURVEY SUMMARY

SURVEY QUESTION #1:What types of park features and activities would you most like to see at this future park?

SURVEY SUMMARY

SURVEY QUESTION #1:What types of park features and activities would you most like to see at this future park?





Community PARK
IDEAS WANTED!

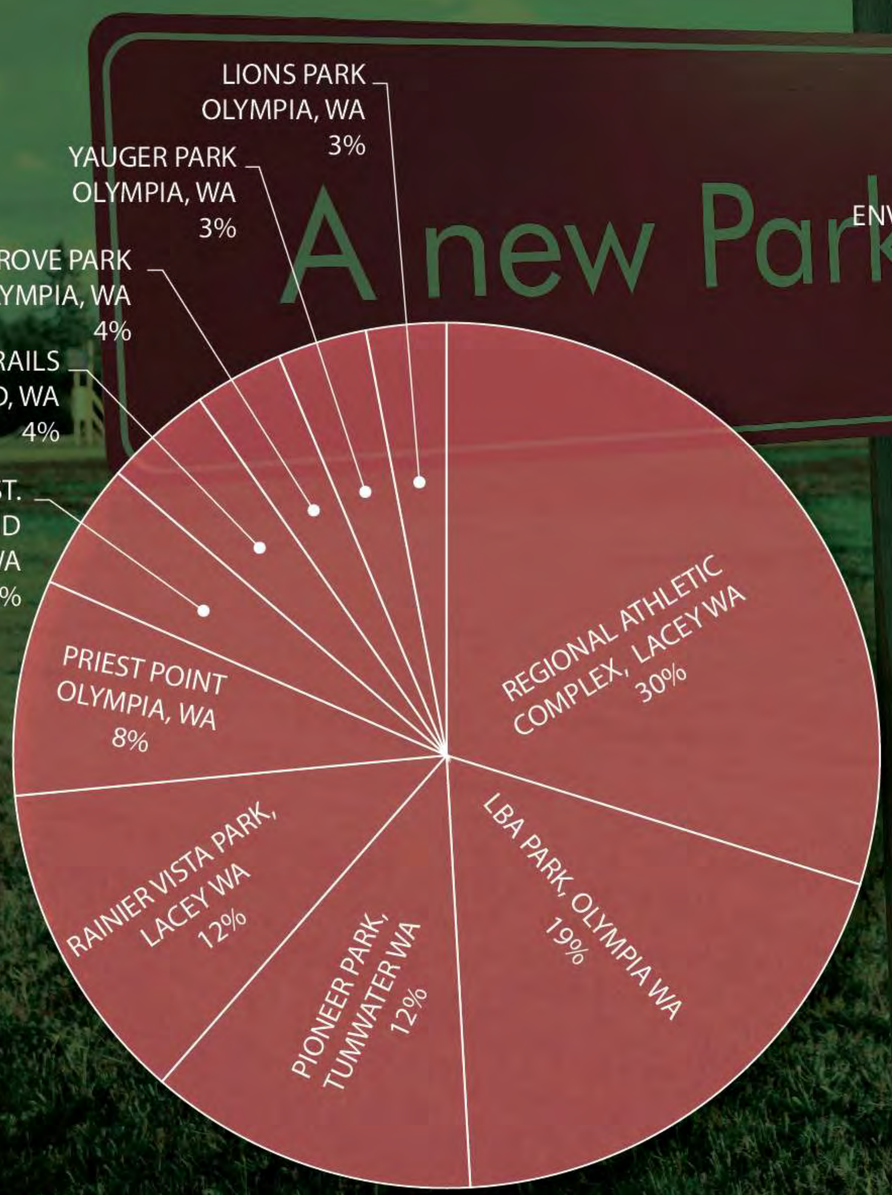
SURVEY SUMMARY

SURVEY QUESTION #1:What types of park features and activities would you most like to see at this future park?

Community PARK
IDEAS WANTED!

SURVEY SUMMARY

TOP TEN PARK PRECEDENTS



TOP TEN CONCERNS FROM NEIGHBORS

SURVEY SUMMARY

SURVEY PARTICIPANTS PROXIMITY TO PARK

TOP TEN QUESTIONS SURVEY PARTICIPANTS HAVE

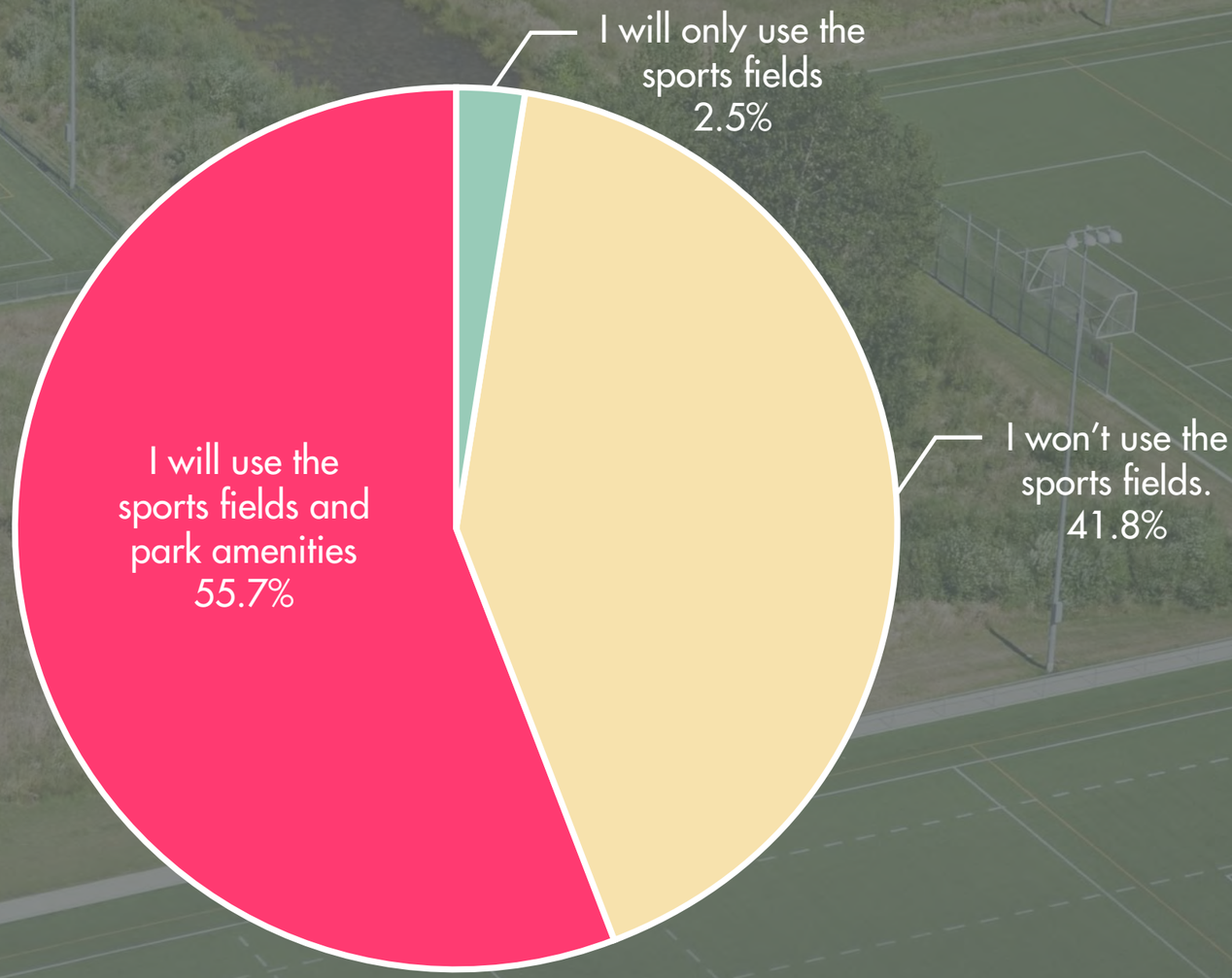
SURVEY SUMMARY

THE FOLLOWING IS A SUMMARY OF A SURVEY CONDUCTED ON THE FUTURE YELM HIGHWAY COMMUNITY PARK.

THE SURVEY WAS OFFERED TO ATTENDEES OF THE FEBRUARY 27, 2020 OUTREACH MEETING AS WELL AS TO MEMBERS OF THE GENERAL PUBLIC. IT WAS MADE AVAILABLE ONLINE AT THE ENGAGE OLYMPIA WEBSITE THE SAME DAY AND CLOSED ON MARCH 22, 2020.

SURVEY SUMMARY

SURVEY QUESTION: Choose the statement that best fits your anticipated use of sports fields in the park:

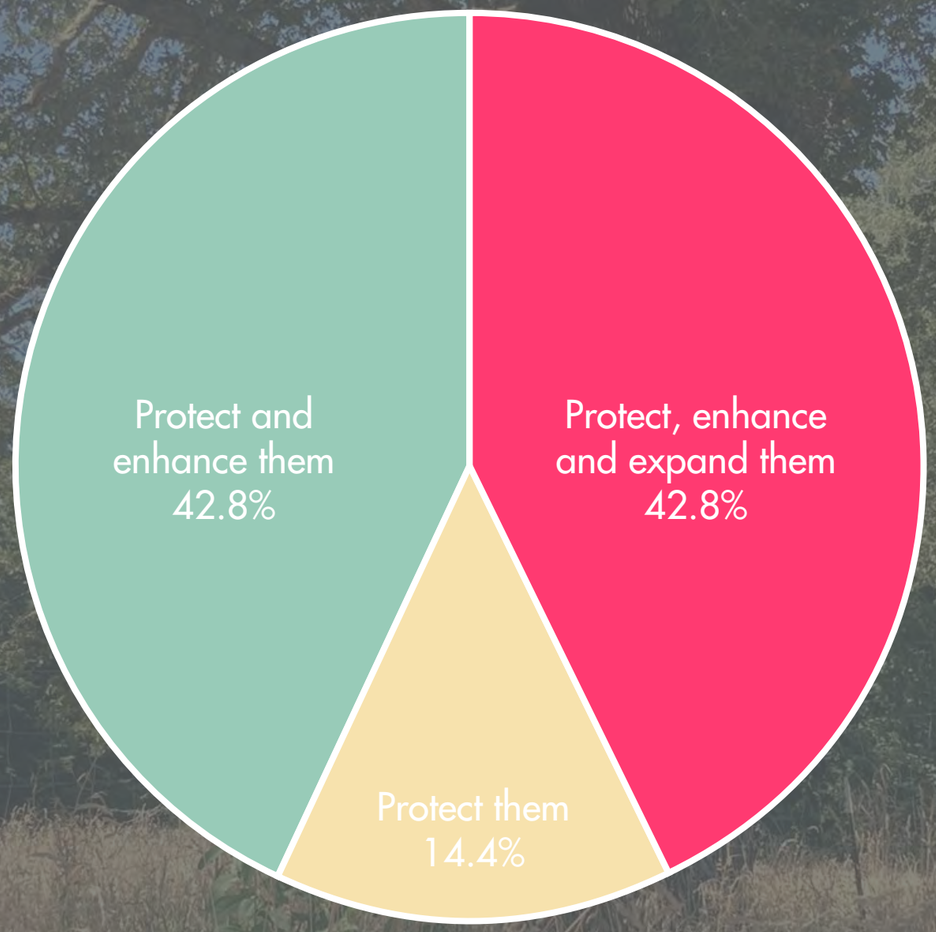


SURVEY SUMMARY

SURVEY QUESTION: I will circulate through the park using the following means (choose all that apply):

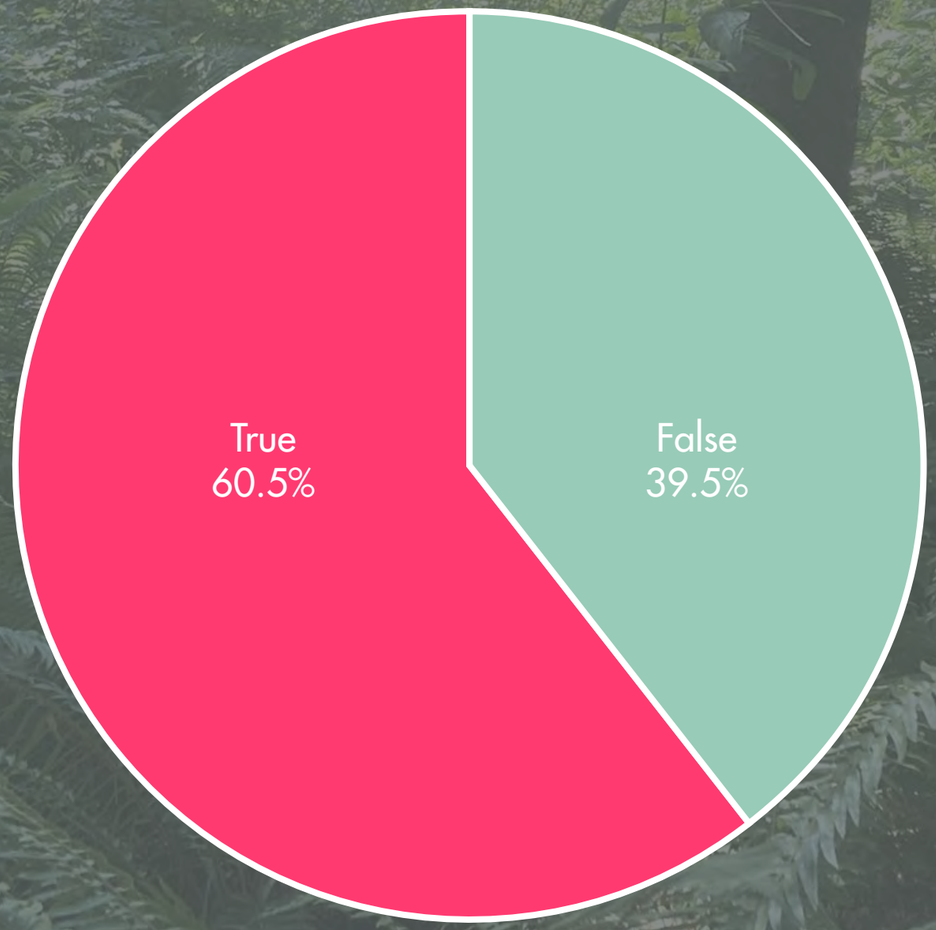
SURVEY SUMMARY

SURVEY QUESTION: With regard to natural features and ecologies, the park design should seek to (choose your favorite):



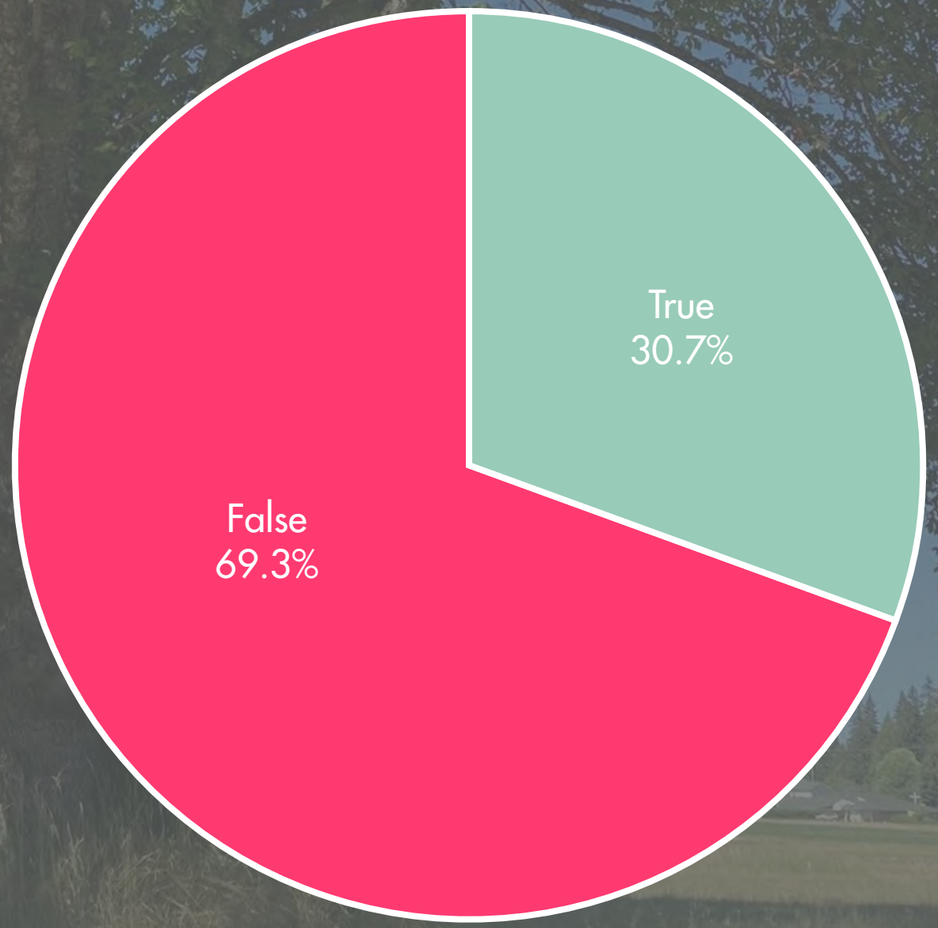
SURVEY SUMMARY

SURVEY QUESTION: When I visit the park, I want to be able to learn more about the natural systems and ecologies in the park through interpretive elements (true/false):



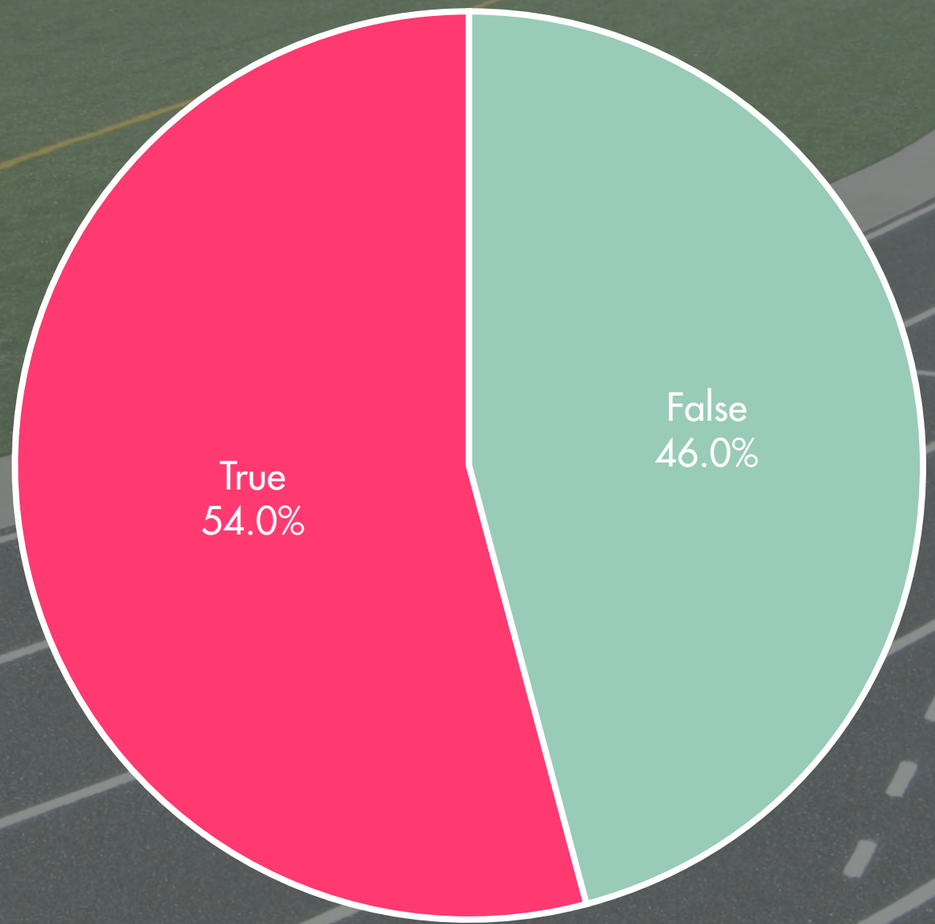
SURVEY SUMMARY

SURVEY QUESTION: When I come to the park, I want to be able to buy a drink and/or food (true/false):



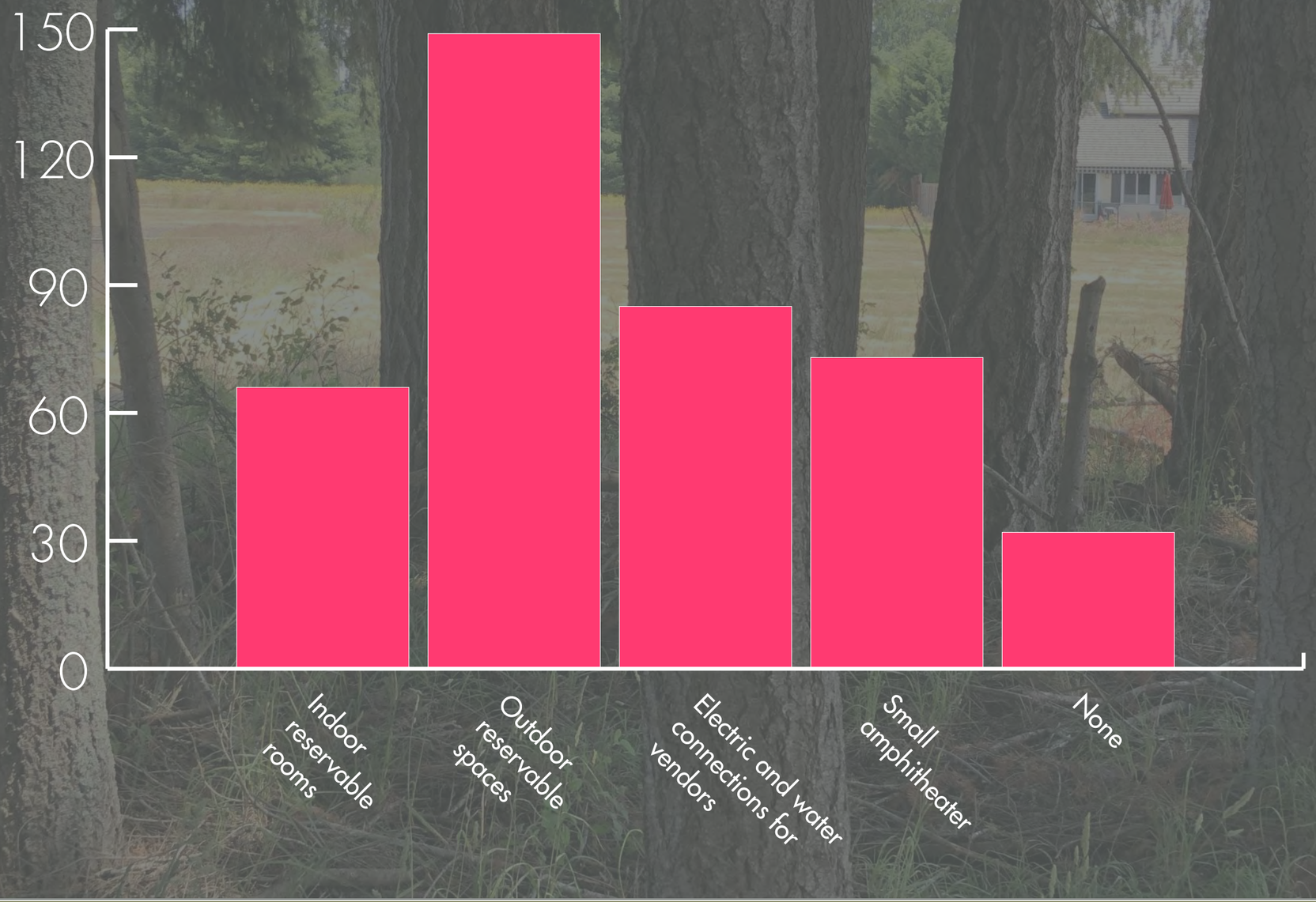
SURVEY SUMMARY

SURVEY QUESTION: Sports fields in the park will be lit for use during non-daylight hours. I'd like to see other areas of the park lit for use during non-daylight hours as well (true/false):



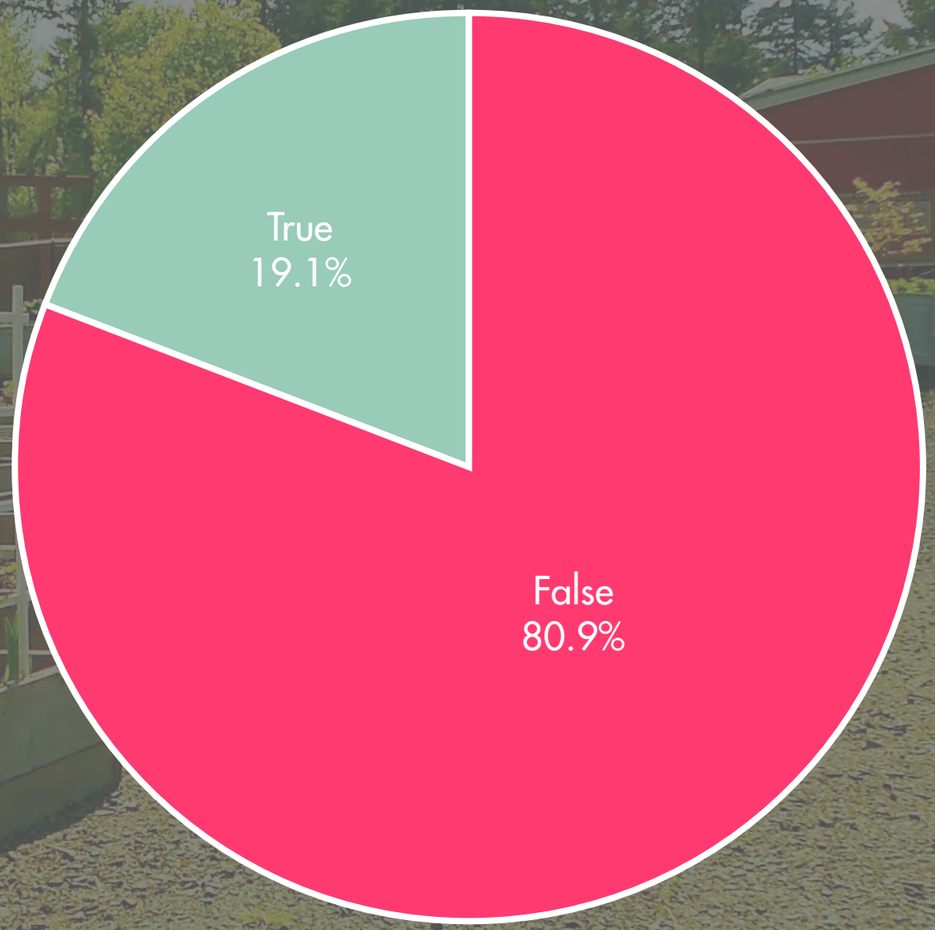
SURVEY SUMMARY

SURVEY QUESTION: The park may have space for gatherings and events. Choose all of the following amenities you'd like to see in the gathering space(s):



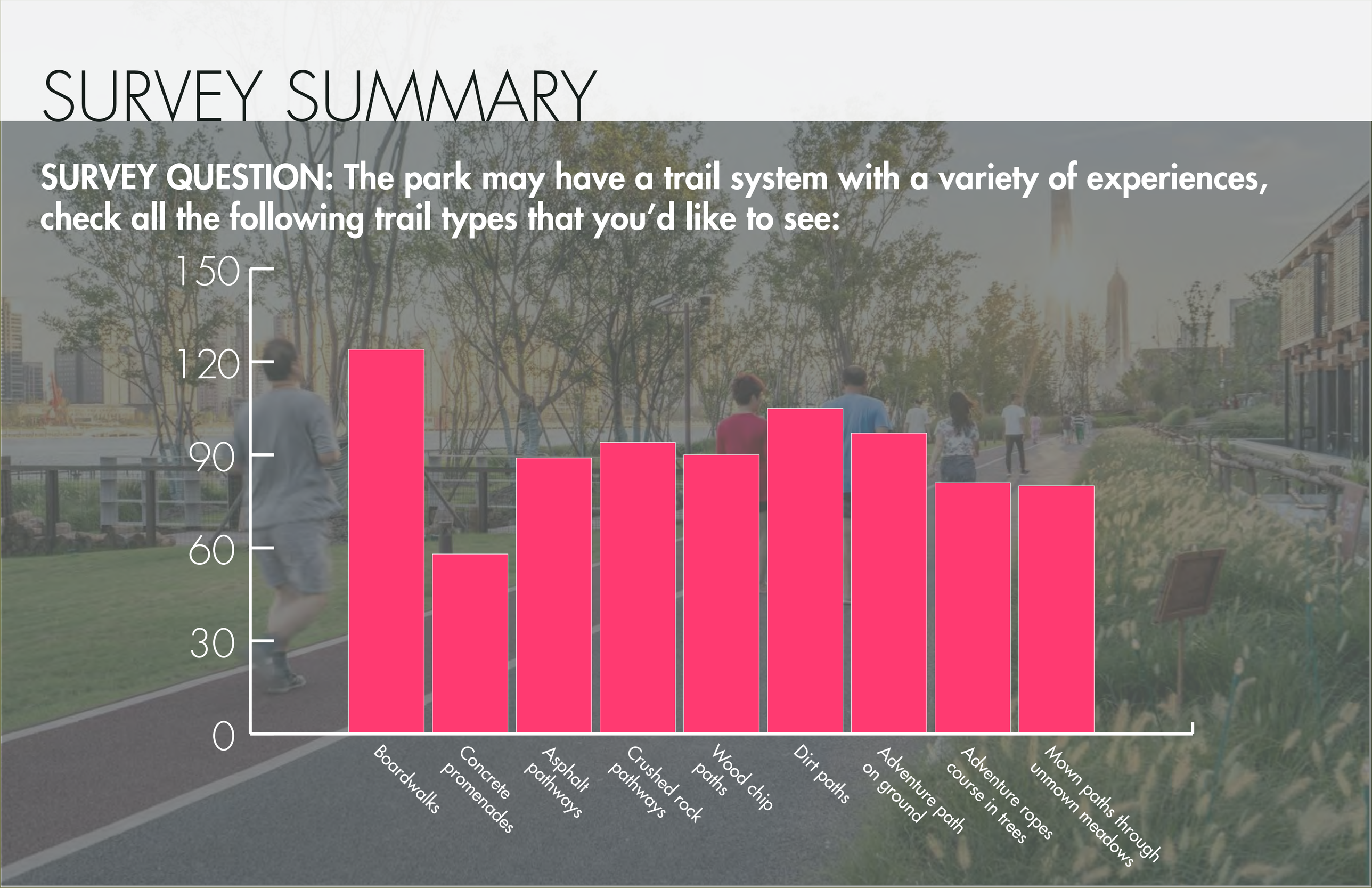
SURVEY SUMMARY

SURVEY QUESTION: If the park had a community garden with plots, I'd be interested in gardening a plot (true/false):



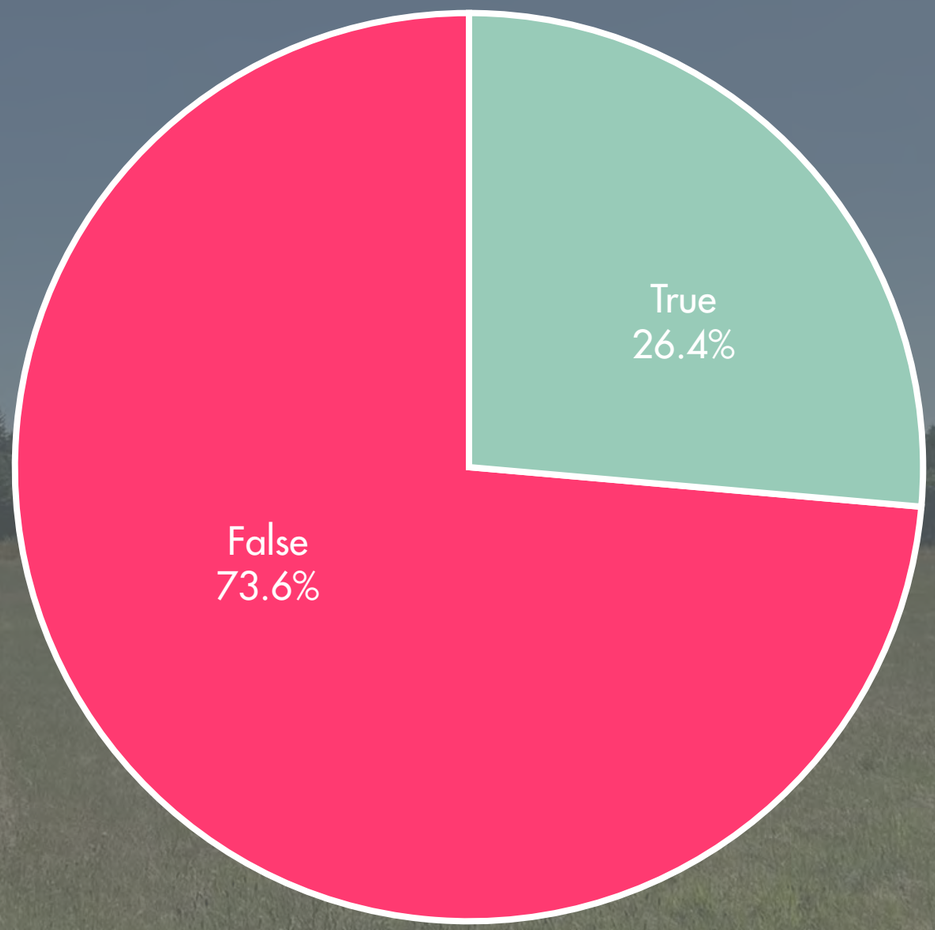
SURVEY SUMMARY

SURVEY QUESTION: The park may have a trail system with a variety of experiences, check all the following trail types that you'd like to see:



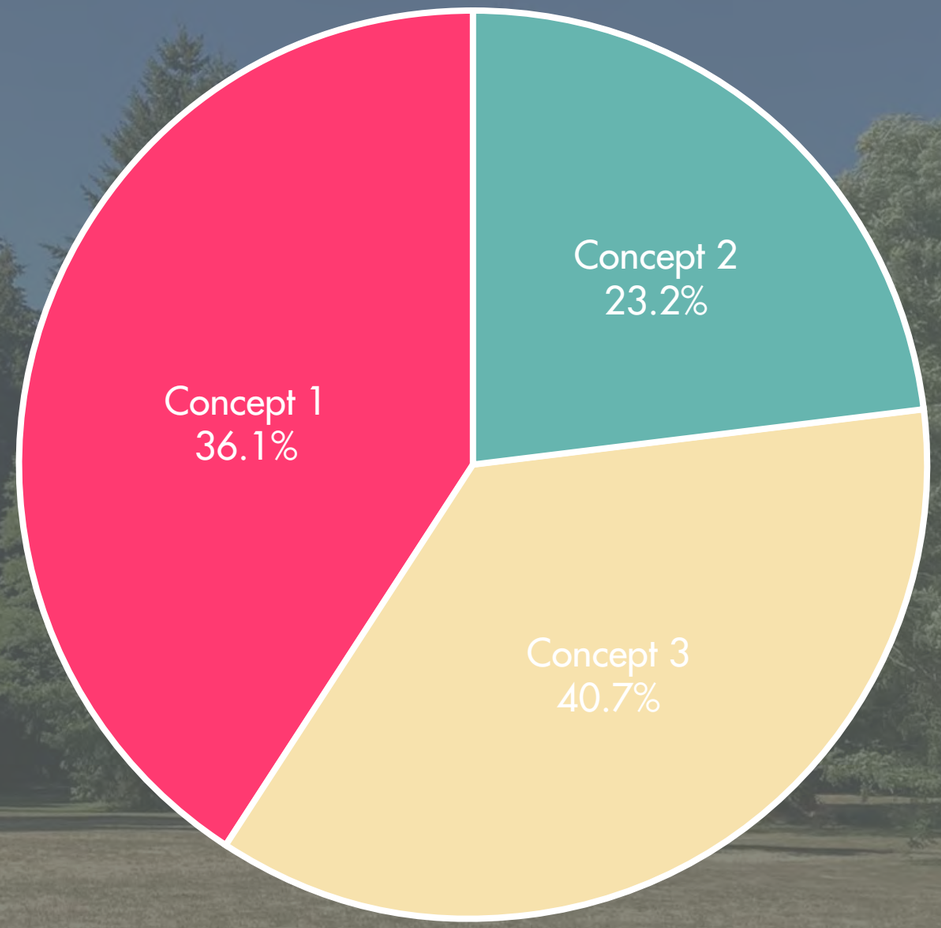
SURVEY SUMMARY

SURVEY QUESTION: The park is very flat currently. Having views of the park, from within the park, is important to me (true/false):



SURVEY SUMMARY

SURVEY QUESTION: Which of the three concept drawings is your favorite?:



SURVEY SUMMARY

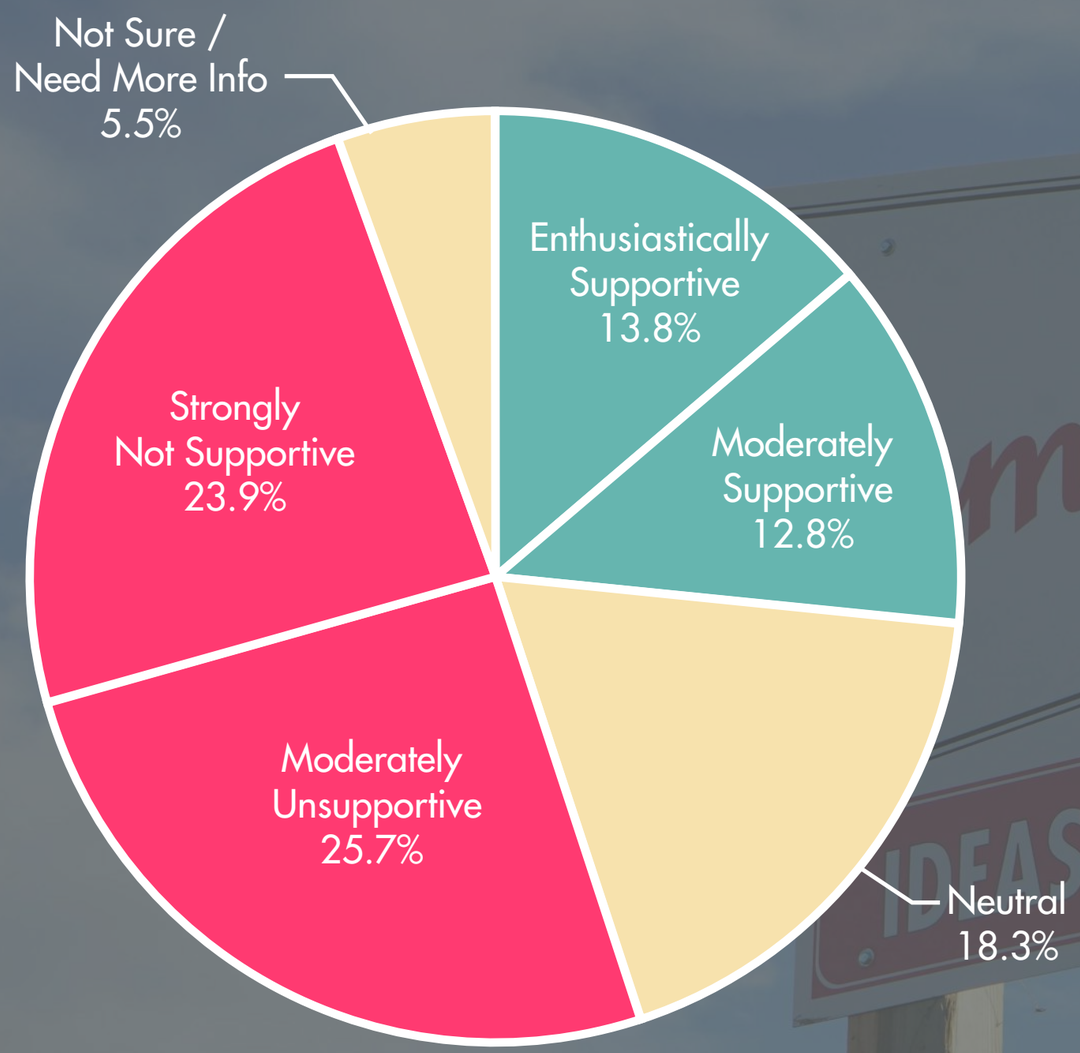
THE FOLLOWING IS A SUMMARY OF THE DATA COLLECTED FROM A PUBLIC SURVEY TITLED:
"Yelm Highway Community Park & Olympia Secondary School Co-location Survey"

THE SURVEY WAS MADE AVAILABLE TO THE PUBLIC VIA THE WEBSITE:
"https://engage.olympiawa.gov/yelm-highway-community-park-plan"

THE SURVEY OPENED 11/07/2020 AND CLOSED 12/6/2020.
109 VISITORS TO THE ENGAGE OLYMPIA SITE COMPLETED THE SURVEY.

SURVEY SUMMARY

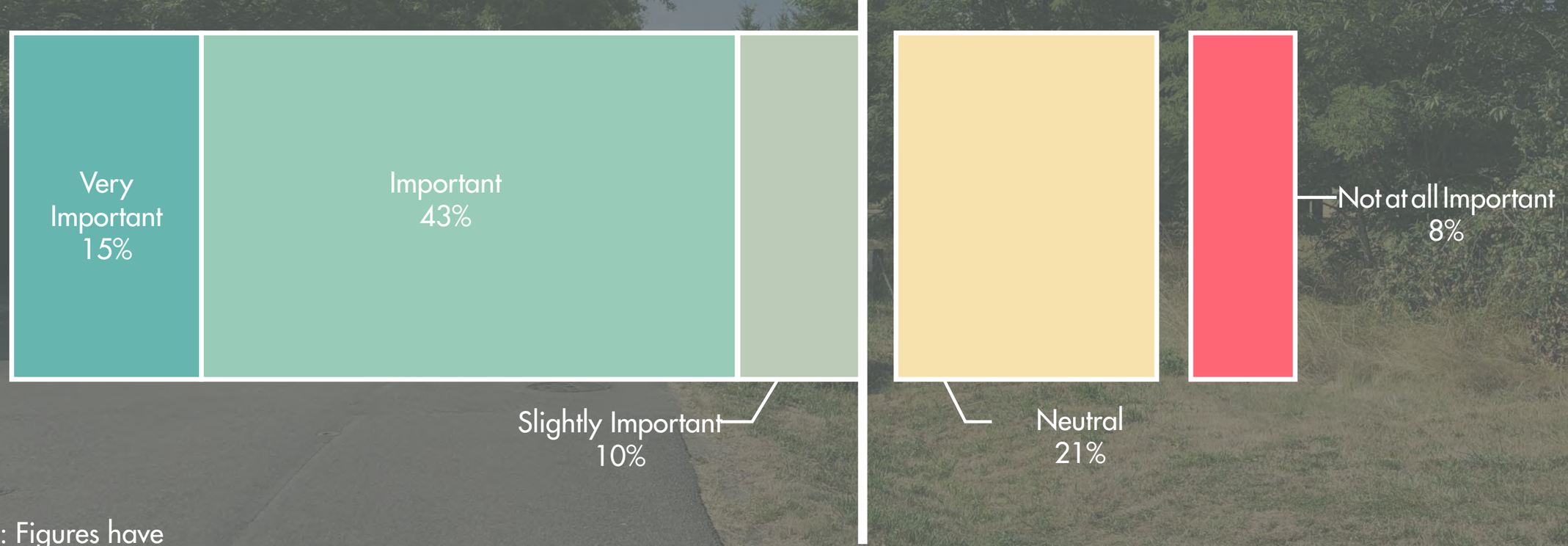
SURVEY QUESTION: When you first heard about the idea of co-locating a secondary school on the Yelm Hwy Community Park site, what was your reaction?



SURVEY SUMMARY

SURVEY QUESTION: How important are the opportunities and benefits of cost efficiencies of shared infrastructure and recreation facilities?

68% of respondents felt it was important to some degree

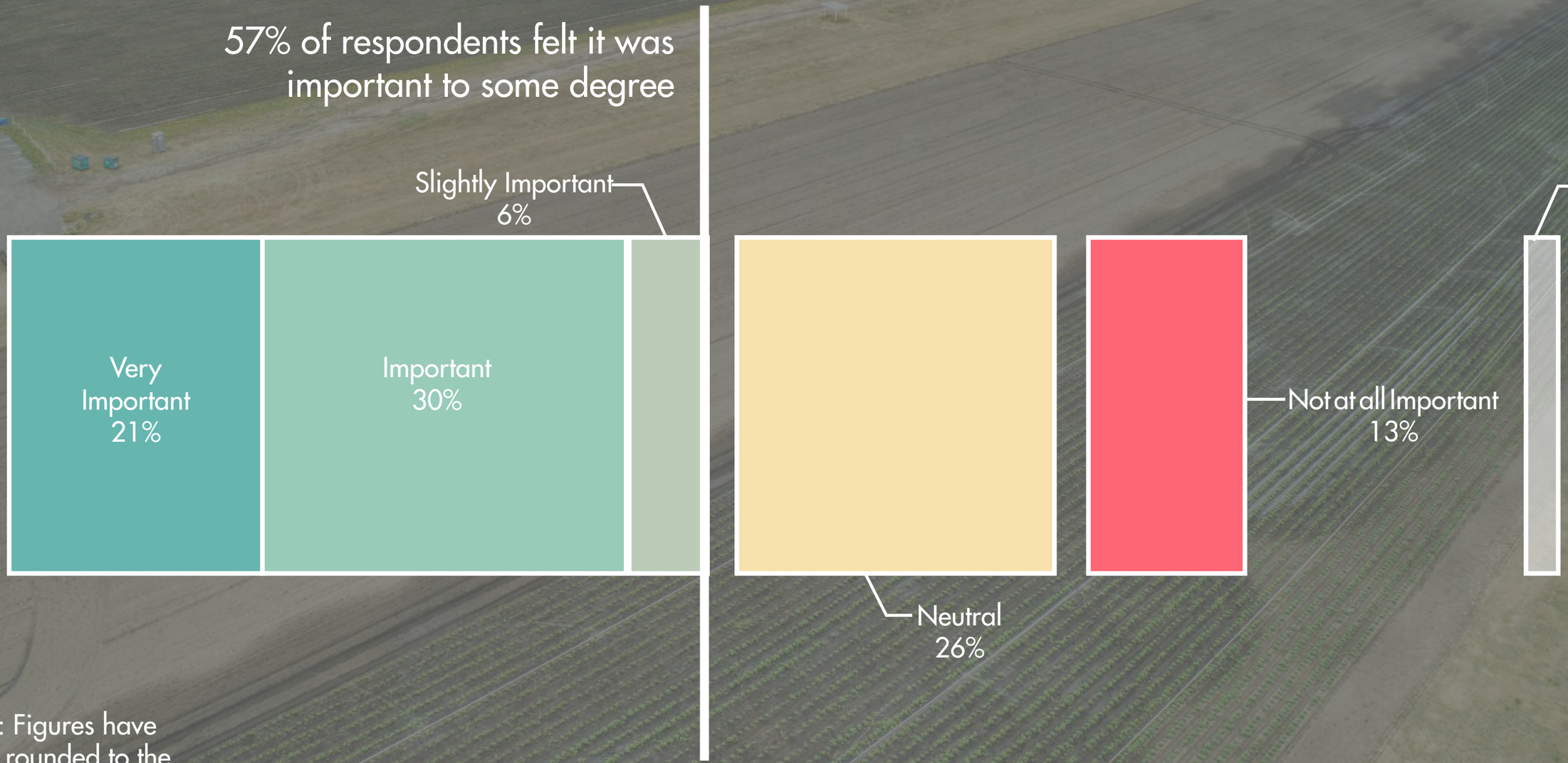


Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: How important are the opportunities and benefits of School District monetary or land compensation to parks?

57% of respondents felt it was important to some degree



Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: How important are the opportunities and benefits of efficient use of parking areas?

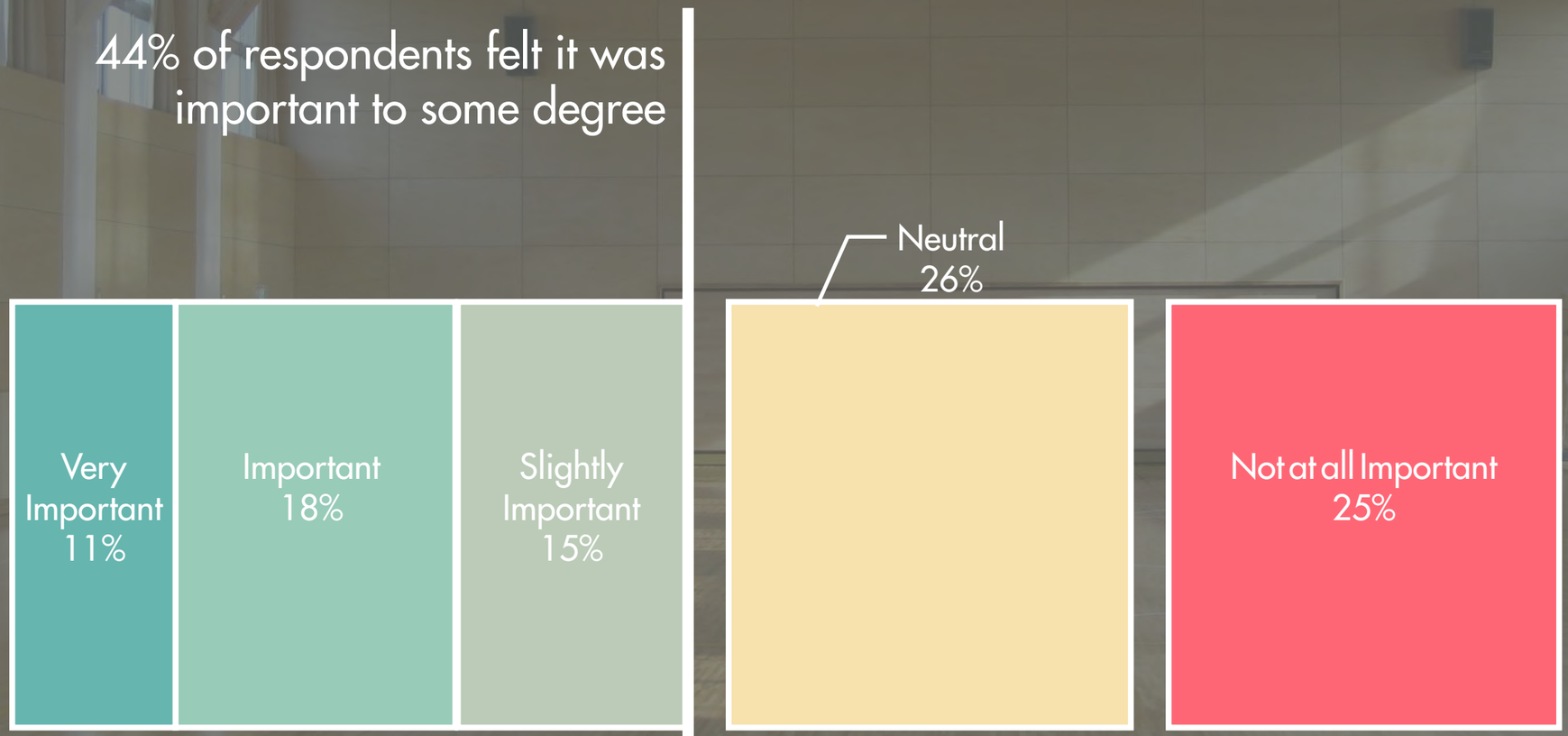
75% of respondents felt it was important to some degree

Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: How important are the opportunities and benefits of inclusion of a community gym?

44% of respondents felt it was important to some degree

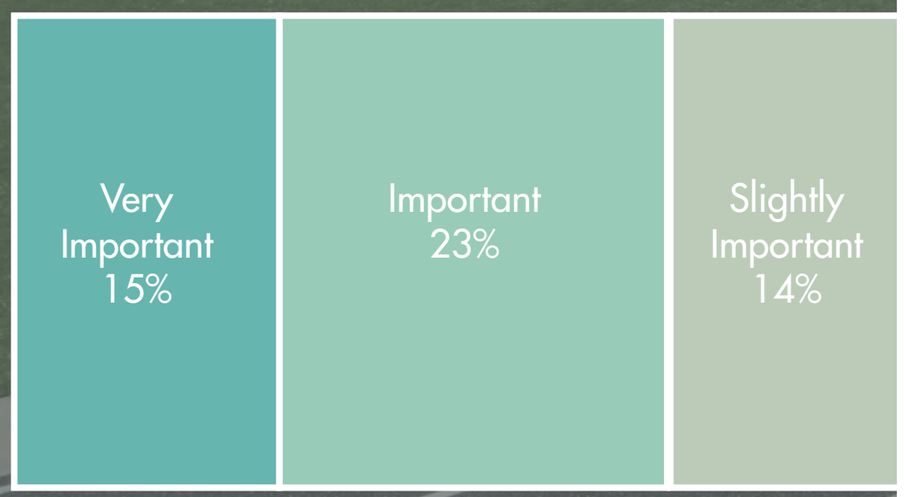


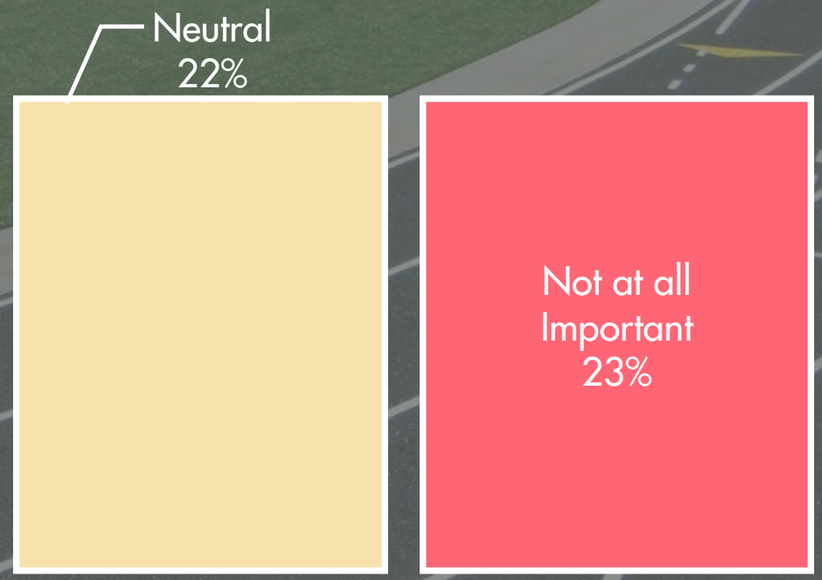
Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: How important are the opportunities and benefits of inclusion of a running track?

52% of respondents felt it was important to some degree

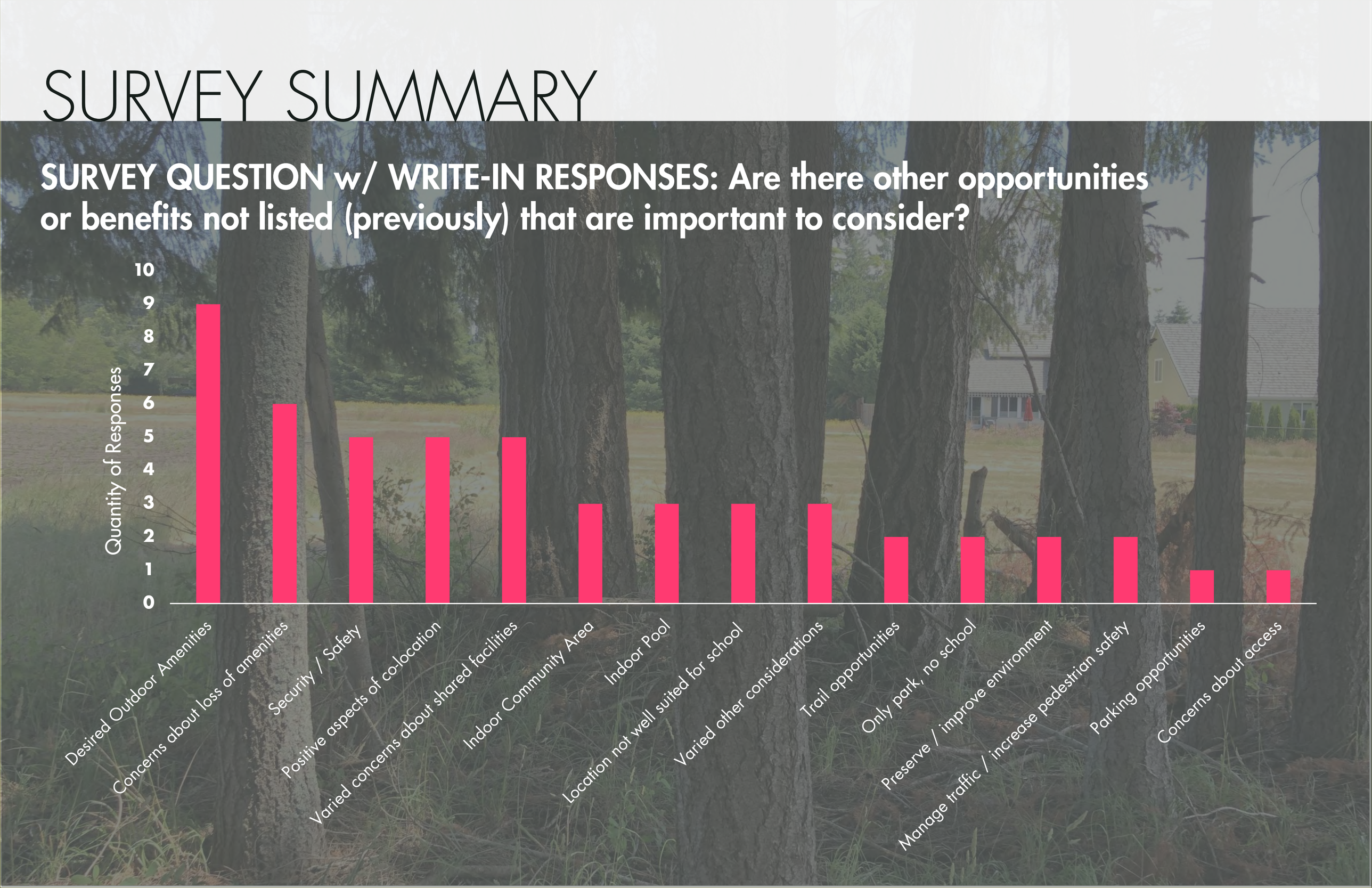




Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

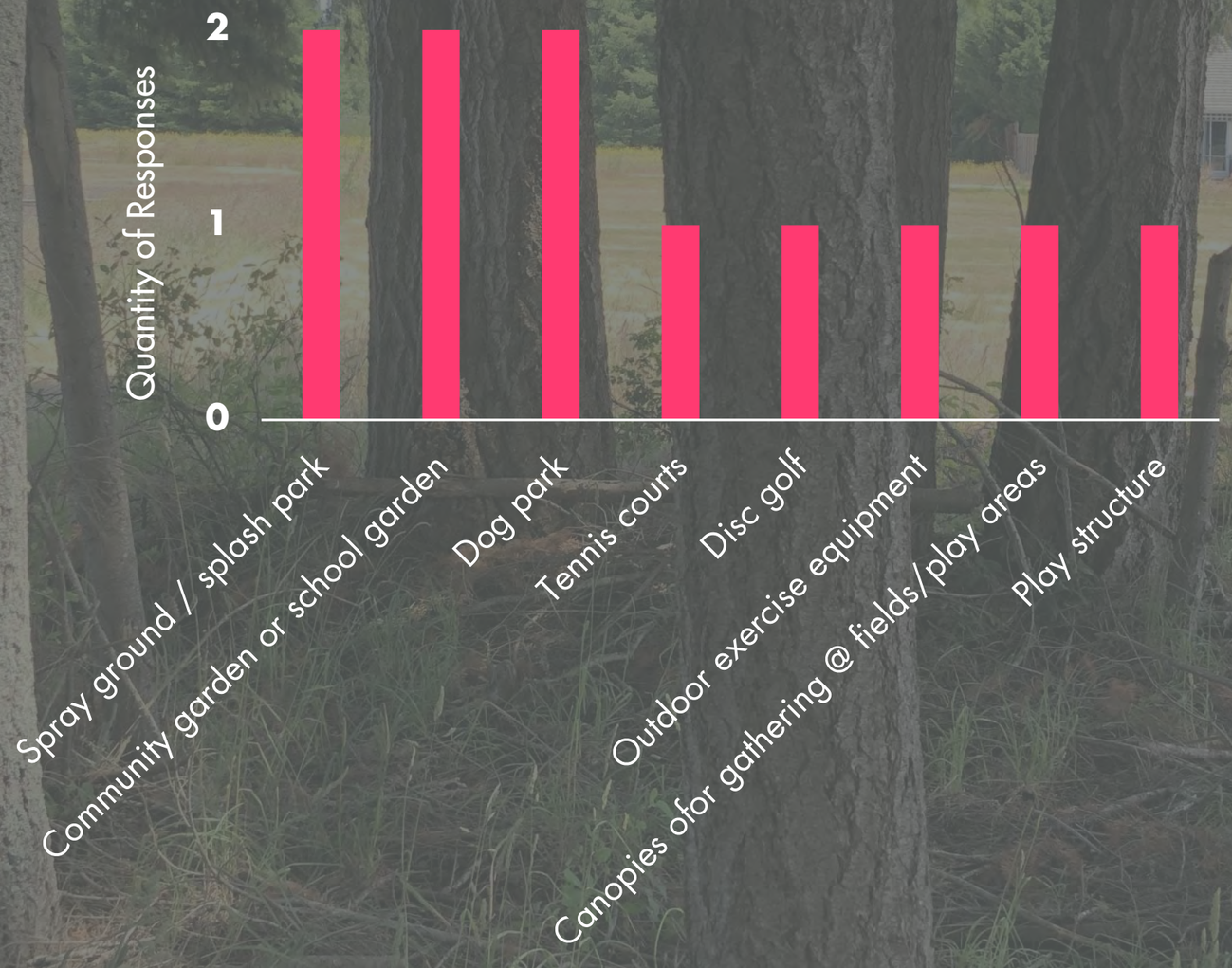
SURVEY QUESTION w/ WRITE-IN RESPONSES: Are there other opportunities or benefits not listed (previously) that are important to consider?



SURVEY SUMMARY

SURVEY QUESTION w/ WRITE-IN RESPONSES: Are there other opportunities or benefits not listed (previously) that are important to consider?

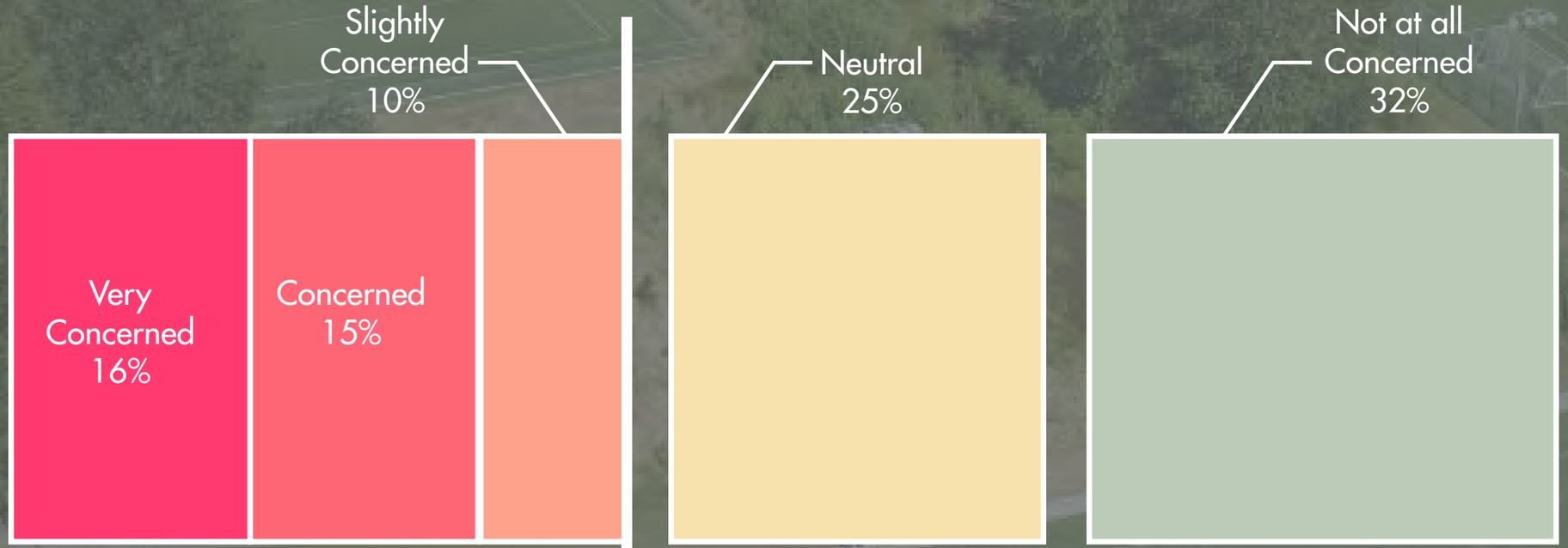
Expanded Detail on Desired Outdoor Amenities:



SURVEY SUMMARY

SURVEY QUESTION: To what degree are you concerned about the following possible impacts of collocating a secondary school with the park?

POSSIBLE IMPACT: One of the four rectangular fields would be shared



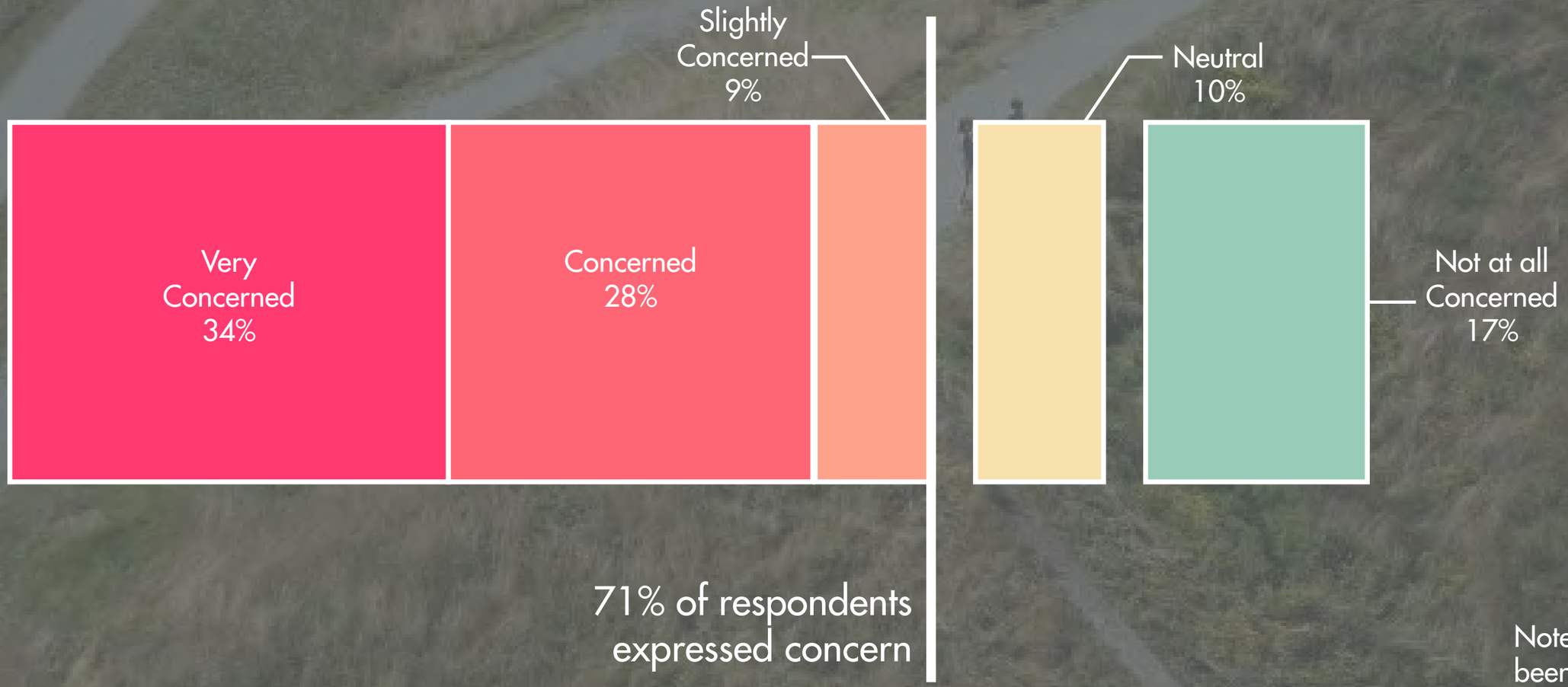
41% of respondents expressed concern

Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: To what degree are you concerned about the following possible impacts of collocating a secondary school with the park?

POSSIBLE IMPACT: Other recreational amenities could be fewer and/or smaller.

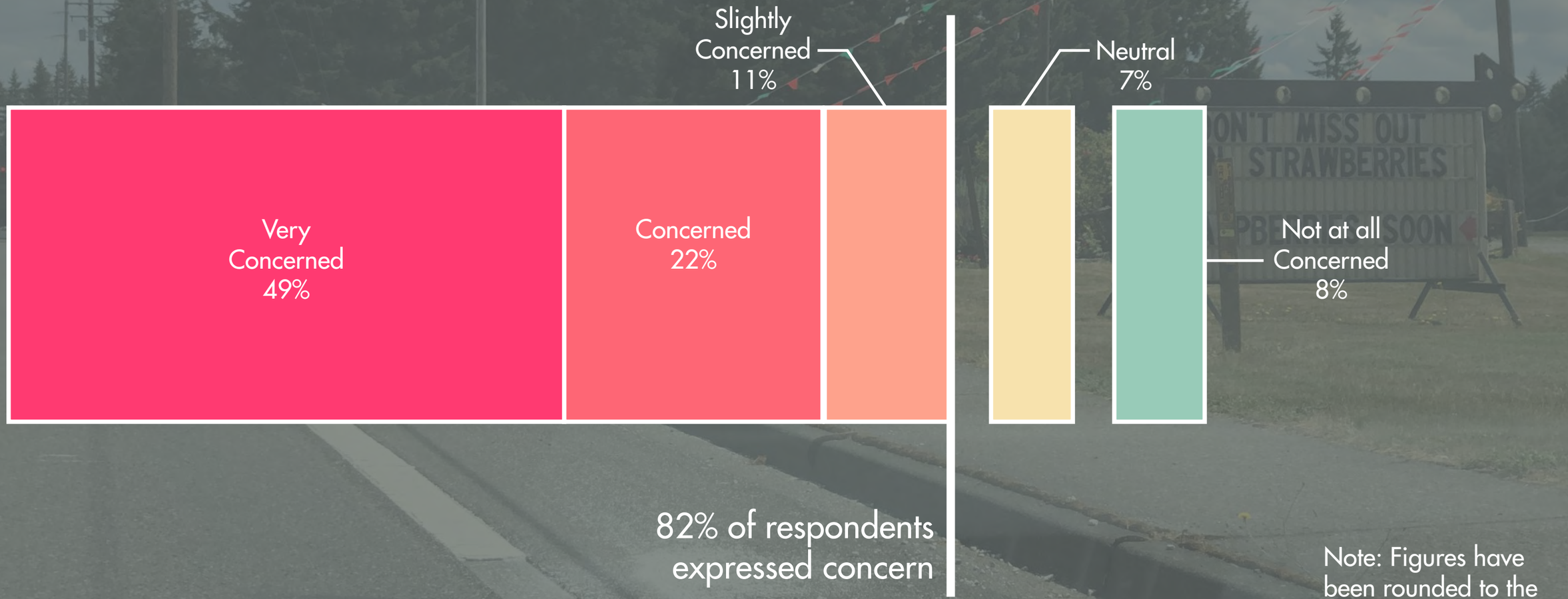


Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: To what degree are you concerned about the following possible impacts of collocating a secondary school with the park?

POSSIBLE IMPACT: Traffic

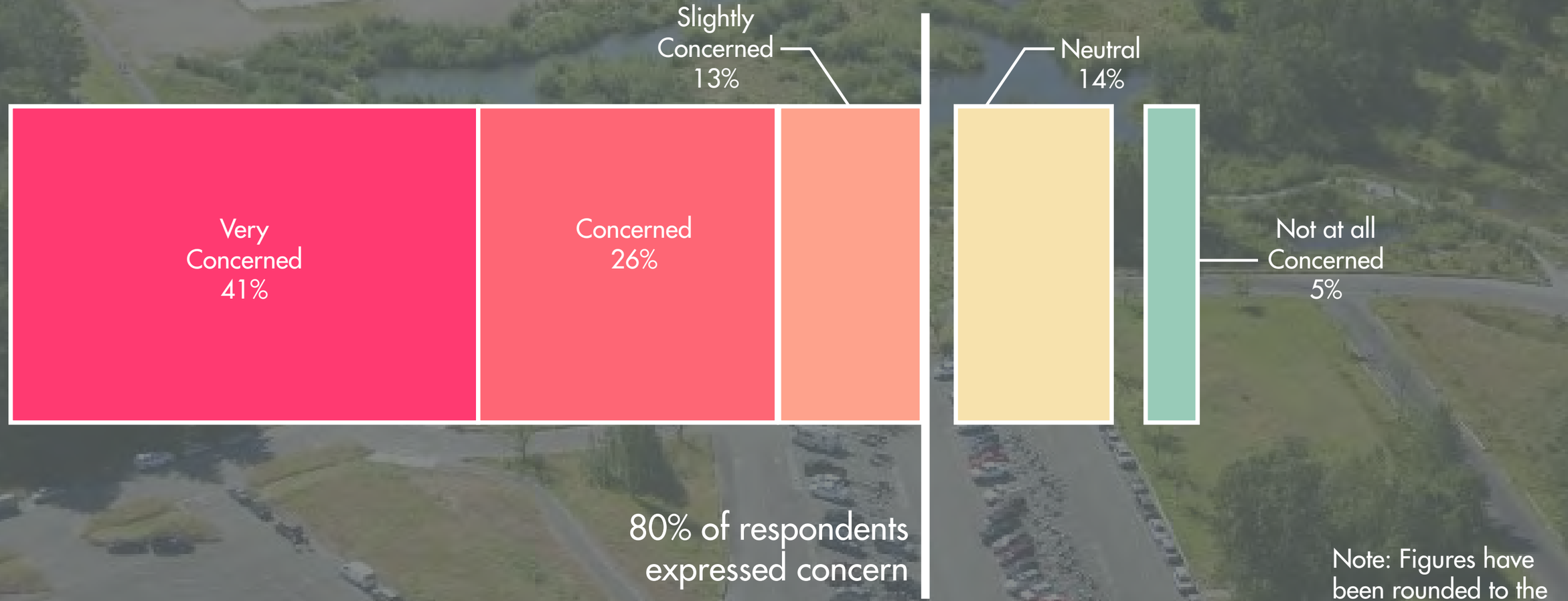


Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: To what degree are you concerned about the following possible impacts of collocating a secondary school with the park?

POSSIBLE IMPACT: Crowded Parking

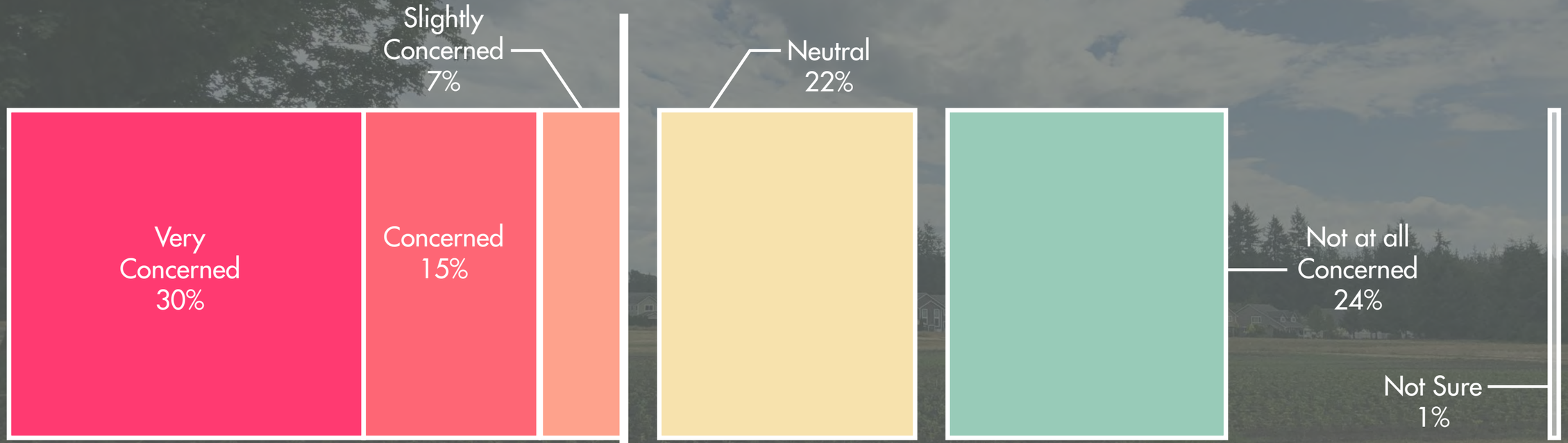


Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION: To what degree are you concerned about the following possible impacts of collocating a secondary school with the park?

POSSIBLE IMPACT: Noise



52% of respondents expressed concern

Note: Figures have been rounded to the nearest whole number

SURVEY SUMMARY

SURVEY QUESTION w/ WRITE-IN RESPONSES: Are there other possible impacts not listed (previously) that concern you?

SURVEY SUMMARY

OPEN-ENDED SURVEY QUESTION: Is there anything else you feel is important to share that was not covered in the (previous) questions?

SURVEY SUMMARY

On August 4, 2021 Berger Partnership presented a proposed concept plan for the southern portion of the future park. The public meeting was hosted over Zoom and recorded in order to facilitate posting to the Engage Olympia webpage following the meeting.

An associated survey was also available on Engage Olympia to gather feedback on the concept plan. The survey was open from August 5, 2021 through September 2, 2021 and received 62 responses.

Note: The survey was open to all members of the public and due to the self-selected nature of the respondents, it is not statistically valid.

SURVEY SUMMARY

SURVEY QUESTION: How far do you live from the park?

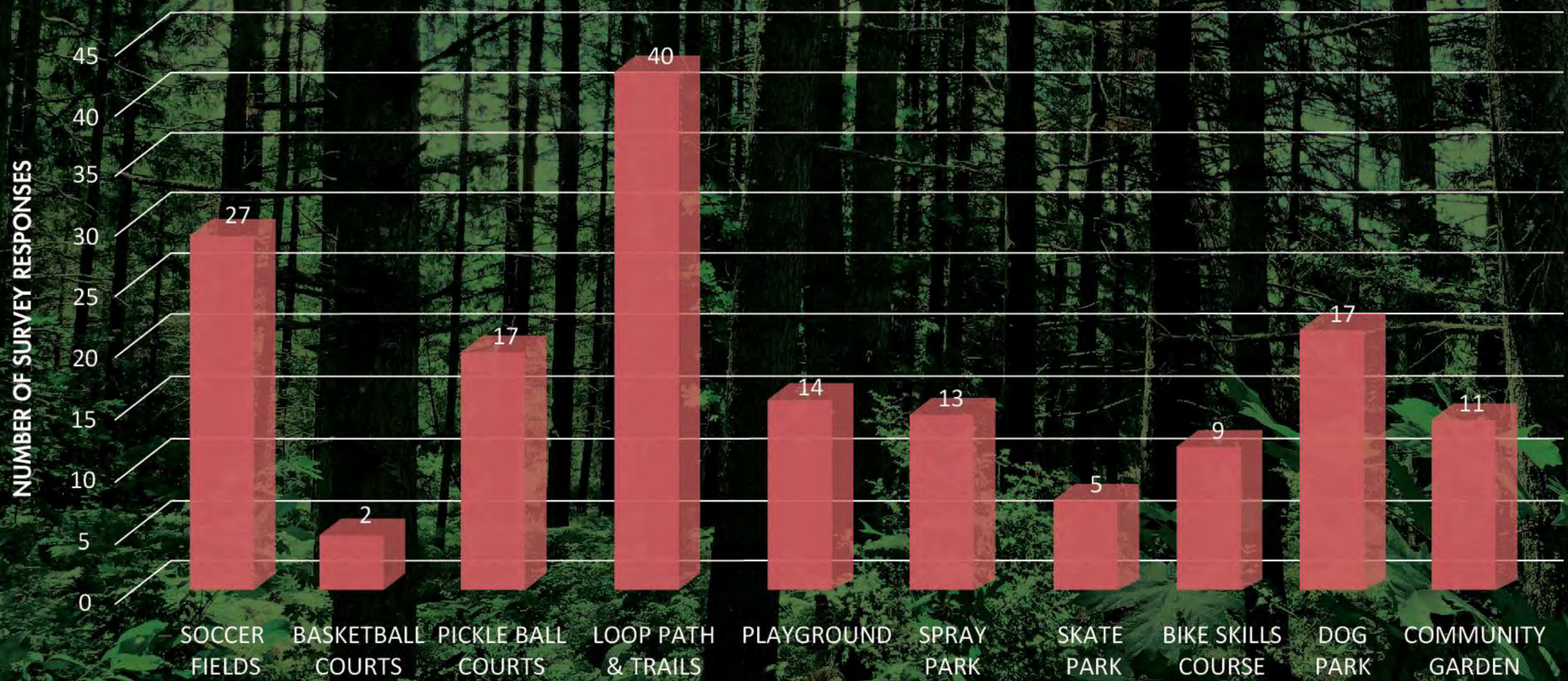
SURVEY SUMMARY

SURVEY QUESTION : From the examples below, is there a particular play area style/theme that you prefer?

- Contemporary / Modern / Colorful
- Nature inspired (plants, wildlife, treehouse, etc.)
- Agriculture (farm equipment, crops, pollinators, etc.)
- No particular preference

SURVEY SUMMARY

SURVEY QUESTION: What activities are you most excited about in the future park?



SURVEY SUMMARY

SURVEY QUESTION: What play elements do you like most for the play areas?

SURVEY SUMMARY

Comments and suggestions from the community:

Traffic / Access Concerns
- Limit access from Hamptons neighborhood
- Indian Summer residents would like a deterrent to keep people off berm
- Indian summer residents concerned with lights and parking lot location
- Provide roundabout on Yelm - perhaps at berry stand
- Provide accessibility around site for all
- Provide good access that doesn't compromise park neighbors
- Managing traffic flow
- Noise concerns

Site Furnishings
- Picnic shelters with BBQs
- Fitness area
- Water fountains throughout

Playground:
- Shade structures + seating adjacent to play areas and splash park
- Seating for caregivers next to the playground (at least partially covered)
- Play equipment that won't hold water easily after rain
- Small coffee stand near playground
- Place for teens and pre-teens to hang out and play
- Picnic areas near playground so families can hang out while kids play
- Open-ended nature play area

Sports Fields & Courts
- Shade or covered seating next to soccer fields
- Fully fenced mini soccer fields for 7 v 7 or pickup games
- 4 fields needed for tournament play
- Urban Soccer Park, so players of all ages can play small sided games
- Open times where soccer fields are open to anyone
- Adequate lighting for winter games
- Seating near pickle ball
- Mod fields

Skate Park
- Provide different zones for different skill levels

Dog Park:
- Benches in the dog park
- Separate areas for big and small dogs

Community garden:
- Shared tools
- Benches
- Water Access
- Community table idea well received - consider pairing with community garden

Wetland Boardwalk:
- Observation deck to linger in wetland and observe wildlife
- Protect / enhance wildlife
- Wildlife viewing

Co-location:
- Concerned with sharing of fields - that school doesn't take over park
- Co-location impacts to traffic and noise

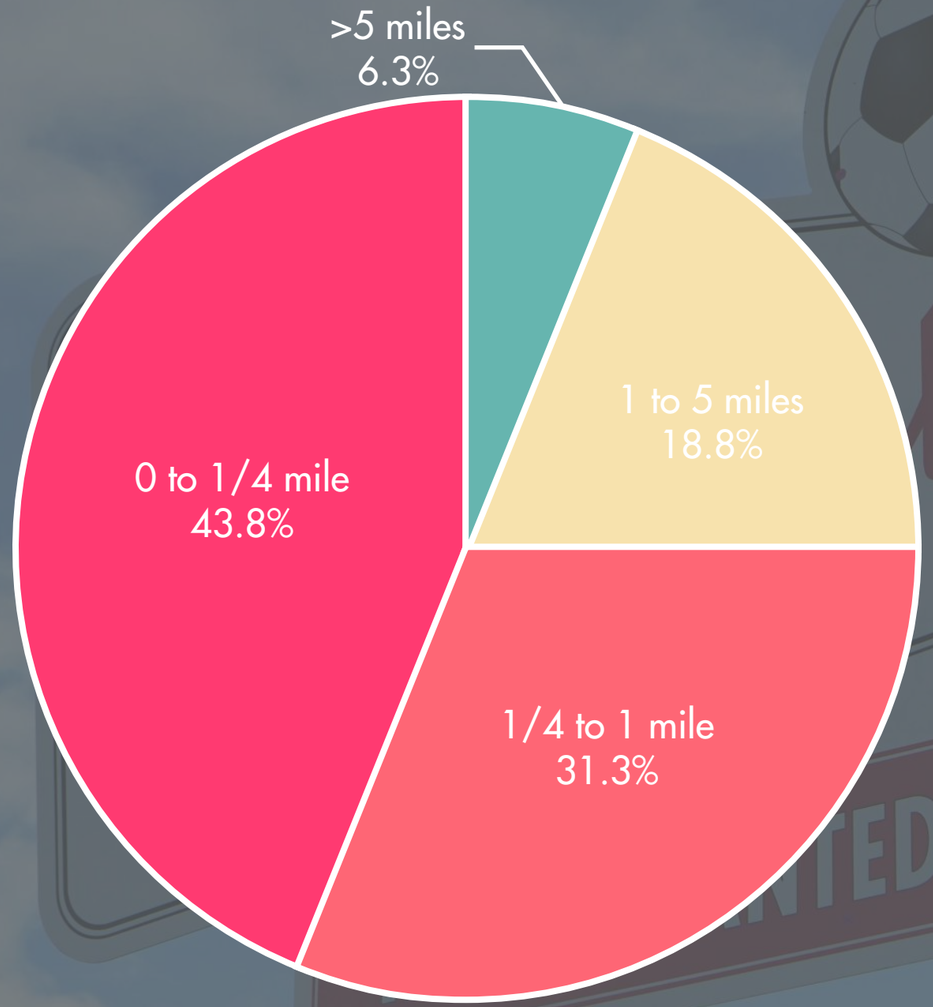
SURVEY SUMMARY

THE FOLLOWING IS A SUMMARY OF A SURVEY CONDUCTED ON THE YELM HIGHWAY COMMUNITY PARK MASTER PLAN.

THE SURVEY WAS OFFERED TO ATTENDEES OF THE AUGUST 3, 2022 OUTREACH MEETING AS WELL AS TO MEMBERS OF THE GENERAL PUBLIC. IT WAS MADE AVAILABLE ONLINE AT THE ENGAGE OLYMPIA WEBSITE THE SAME DAY AND CLOSED ON AUGUST 23, 2022.

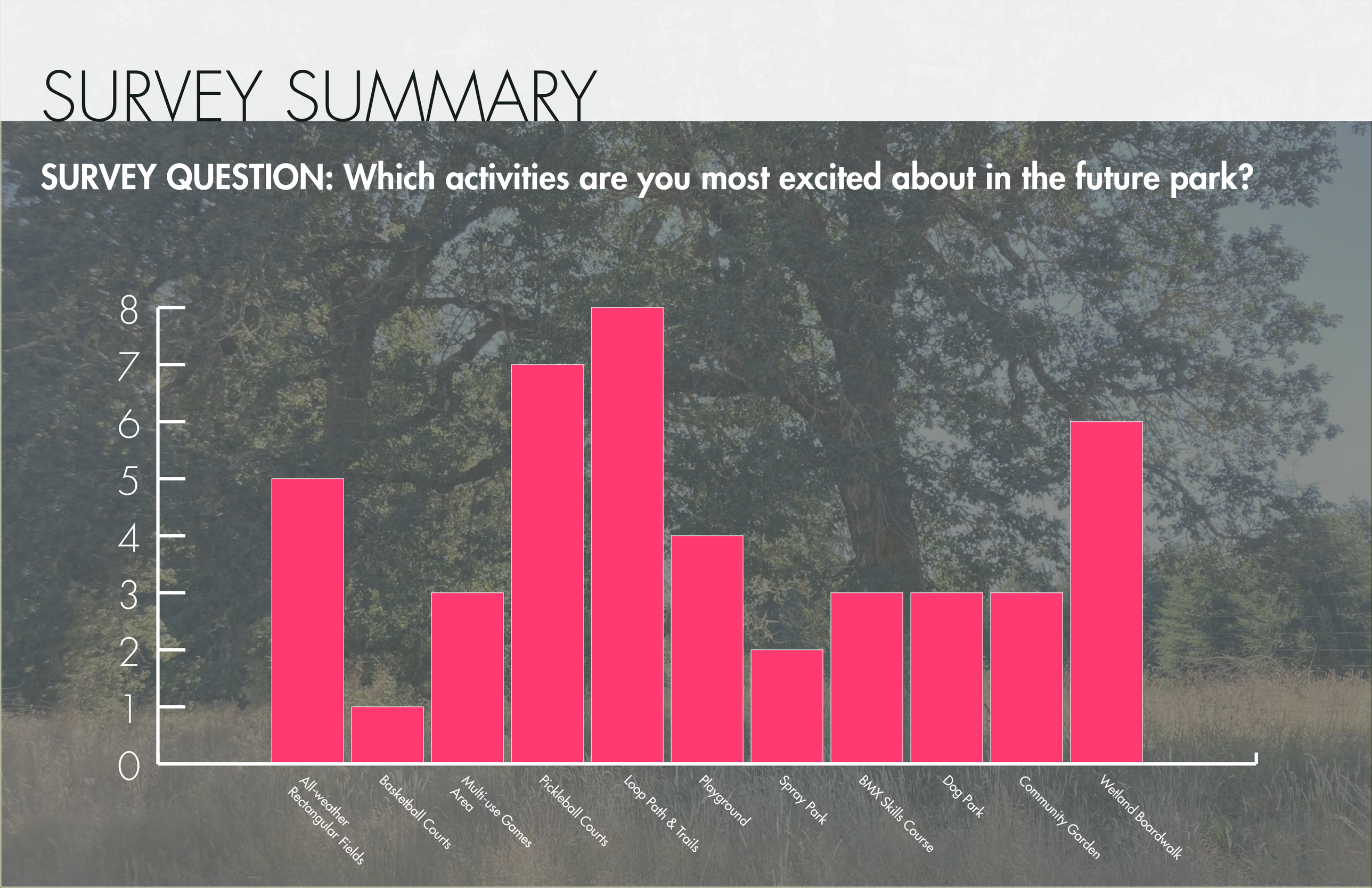
SURVEY SUMMARY

SURVEY QUESTION: How far do you live from the site?



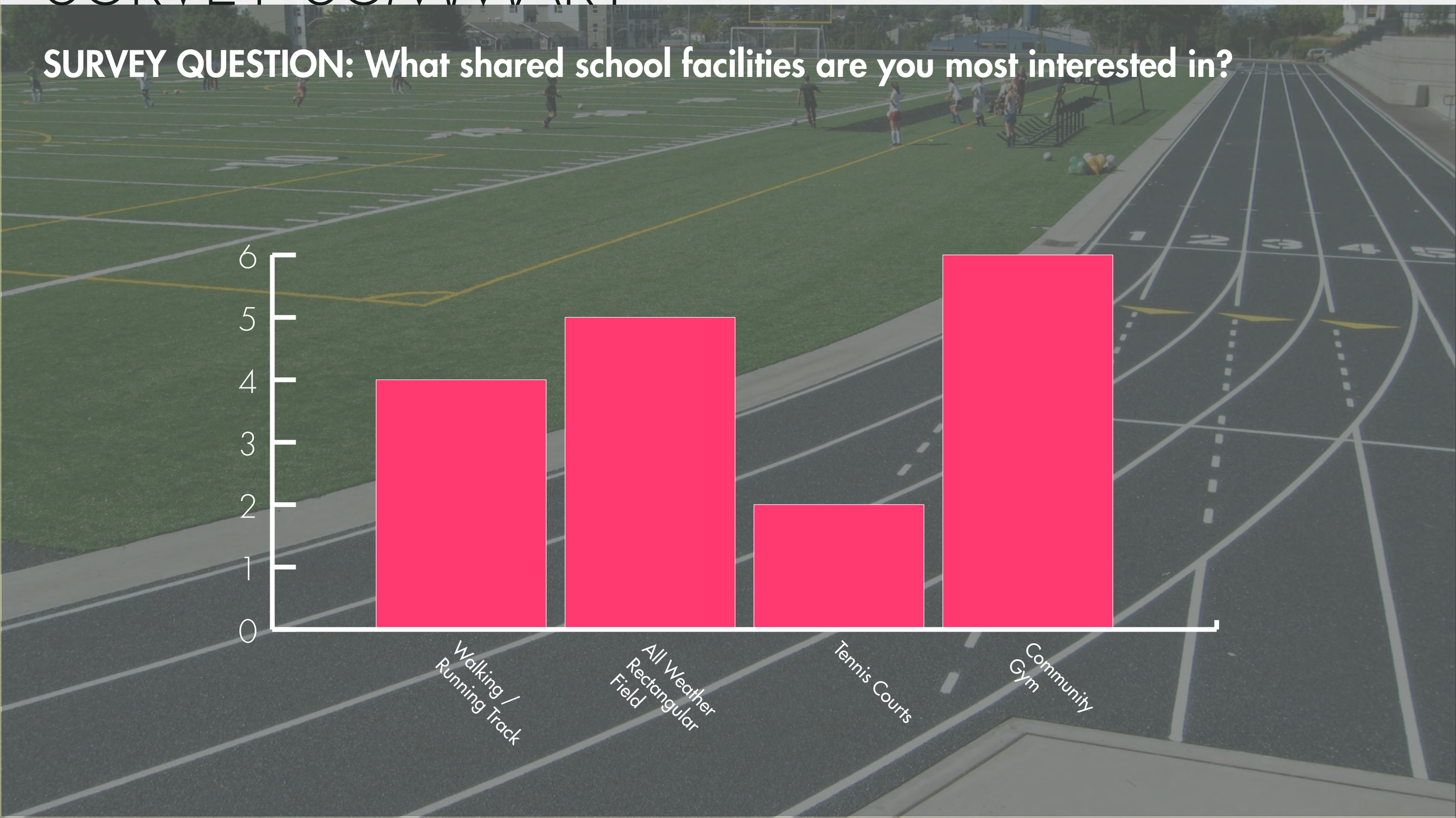
SURVEY SUMMARY

SURVEY QUESTION: Which activities are you most excited about in the future park?



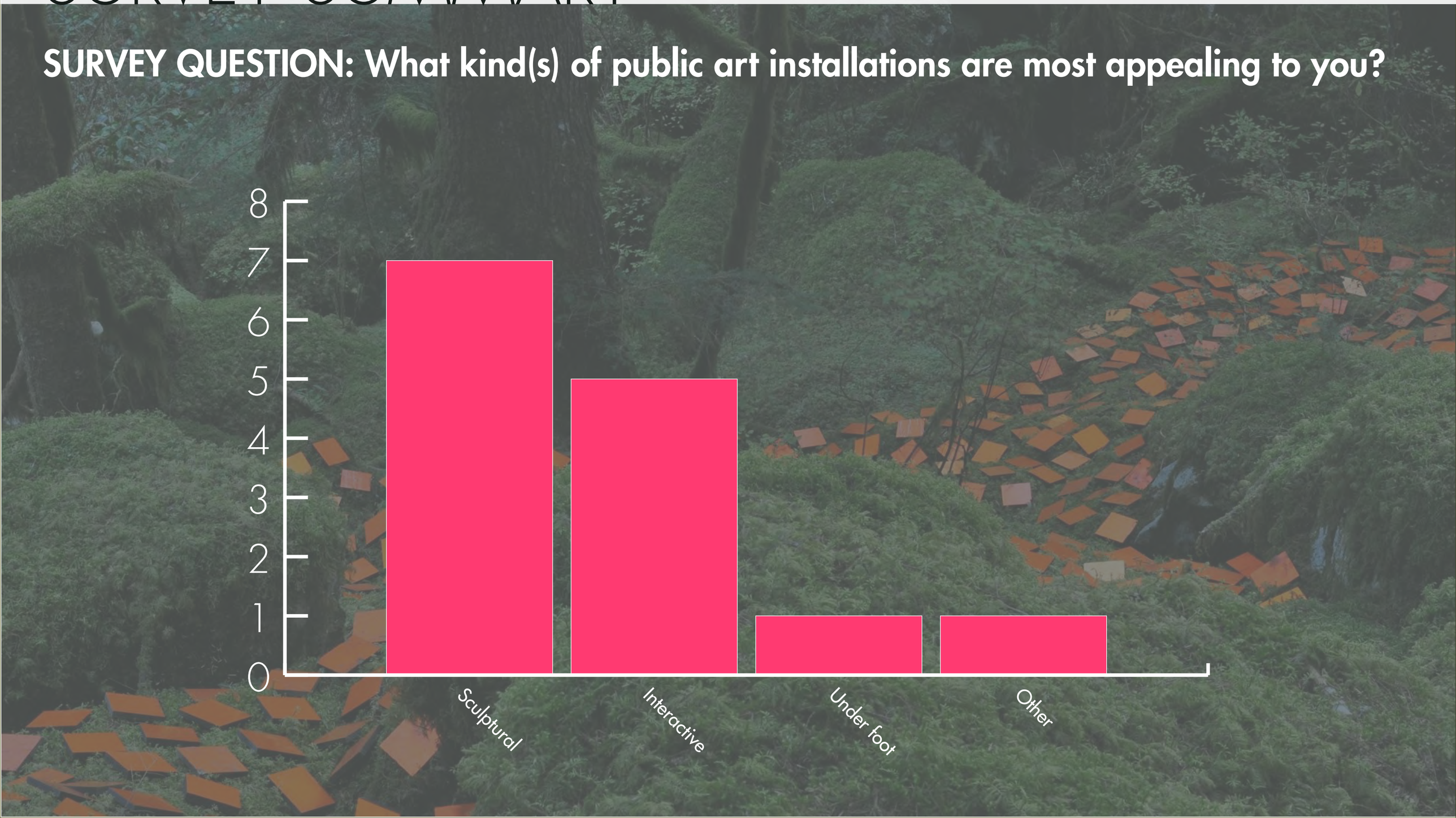
SURVEY SUMMARY

SURVEY QUESTION: What shared school facilities are you most interested in?



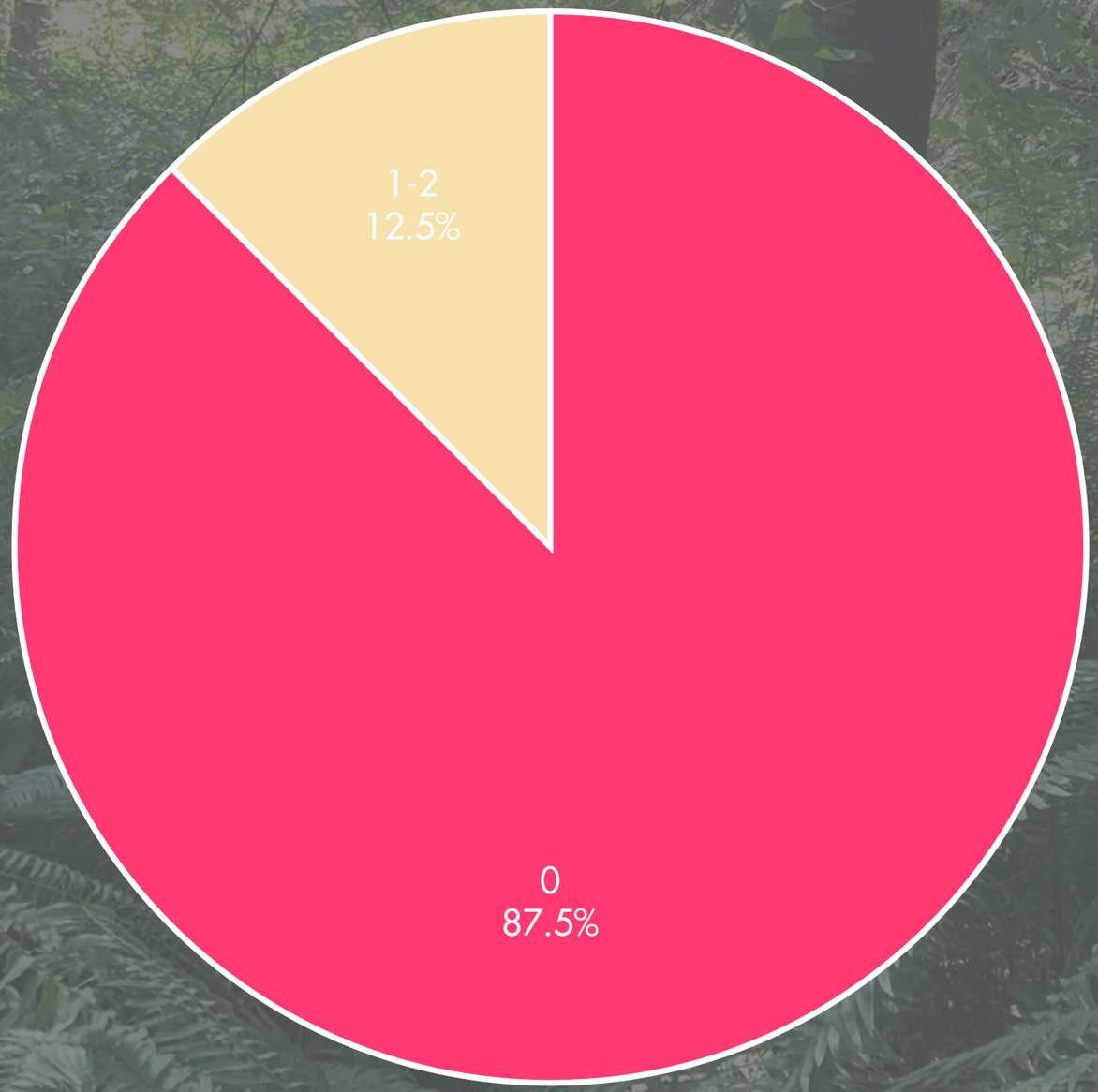
SURVEY SUMMARY

SURVEY QUESTION: What kind(s) of public art installations are most appealing to you?



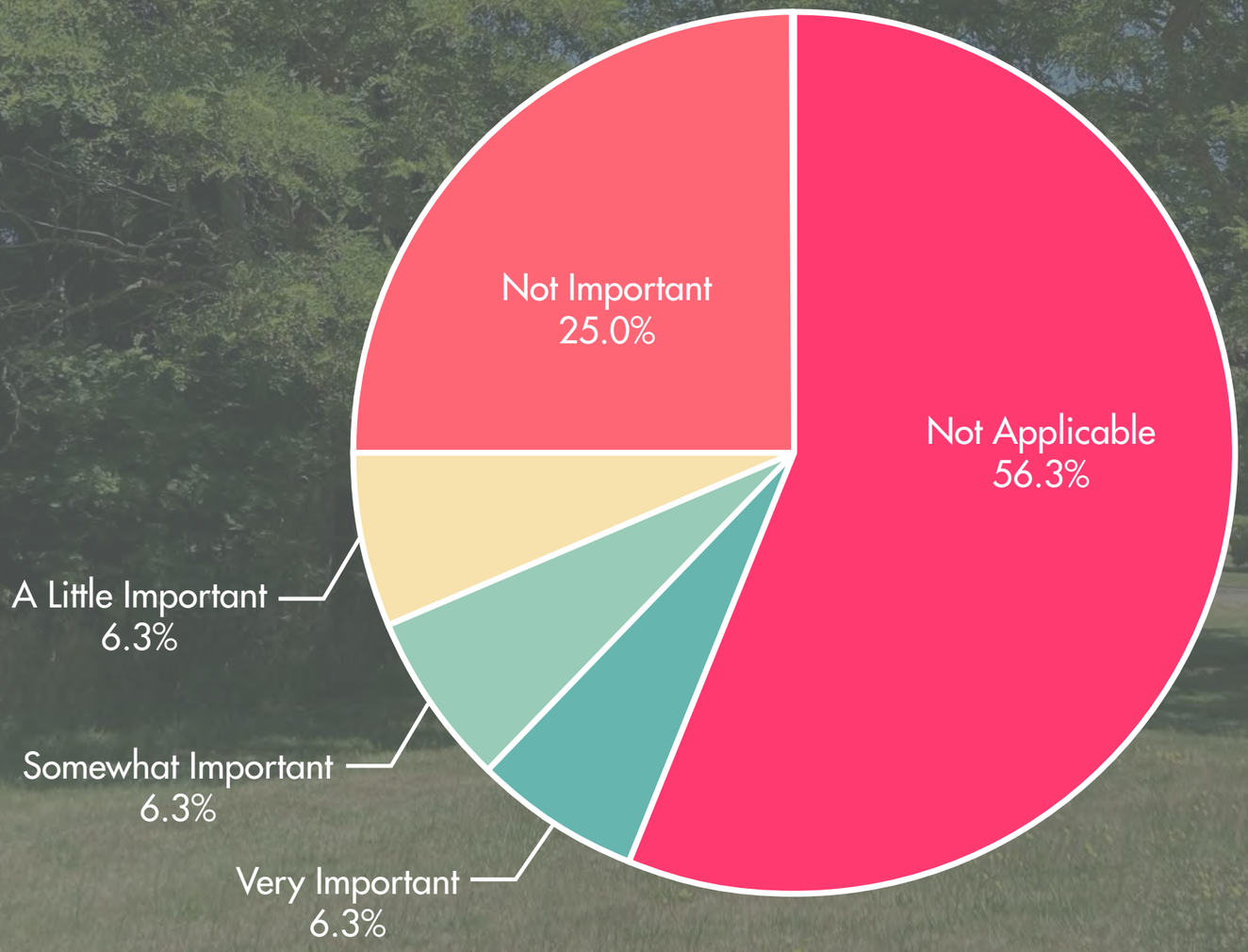
SURVEY SUMMARY

SURVEY QUESTION: How many children under age 8 are in your household?



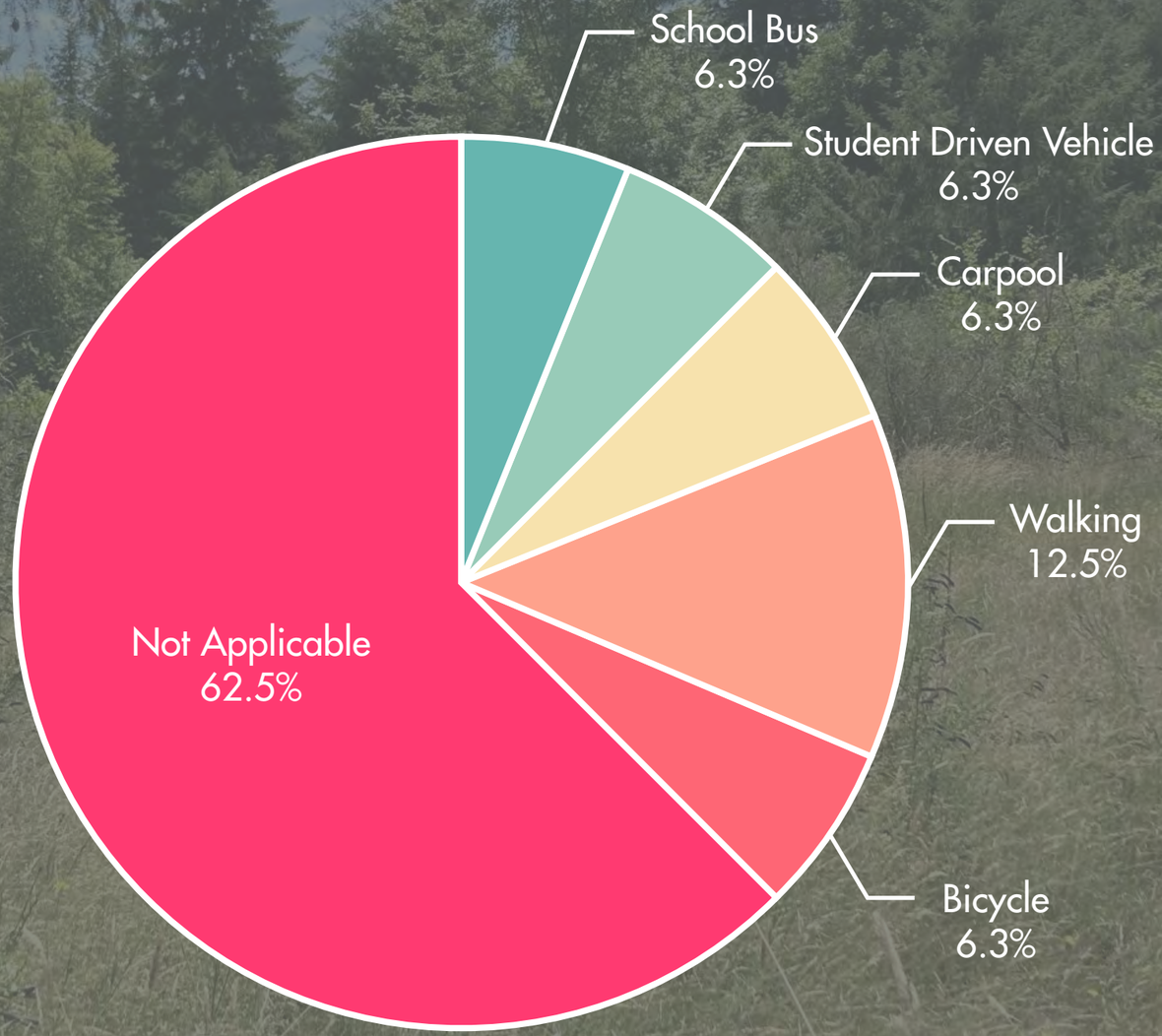
SURVEY SUMMARY

SURVEY QUESTION: How important is the proximity of a new high school to other siblings' school within the district?



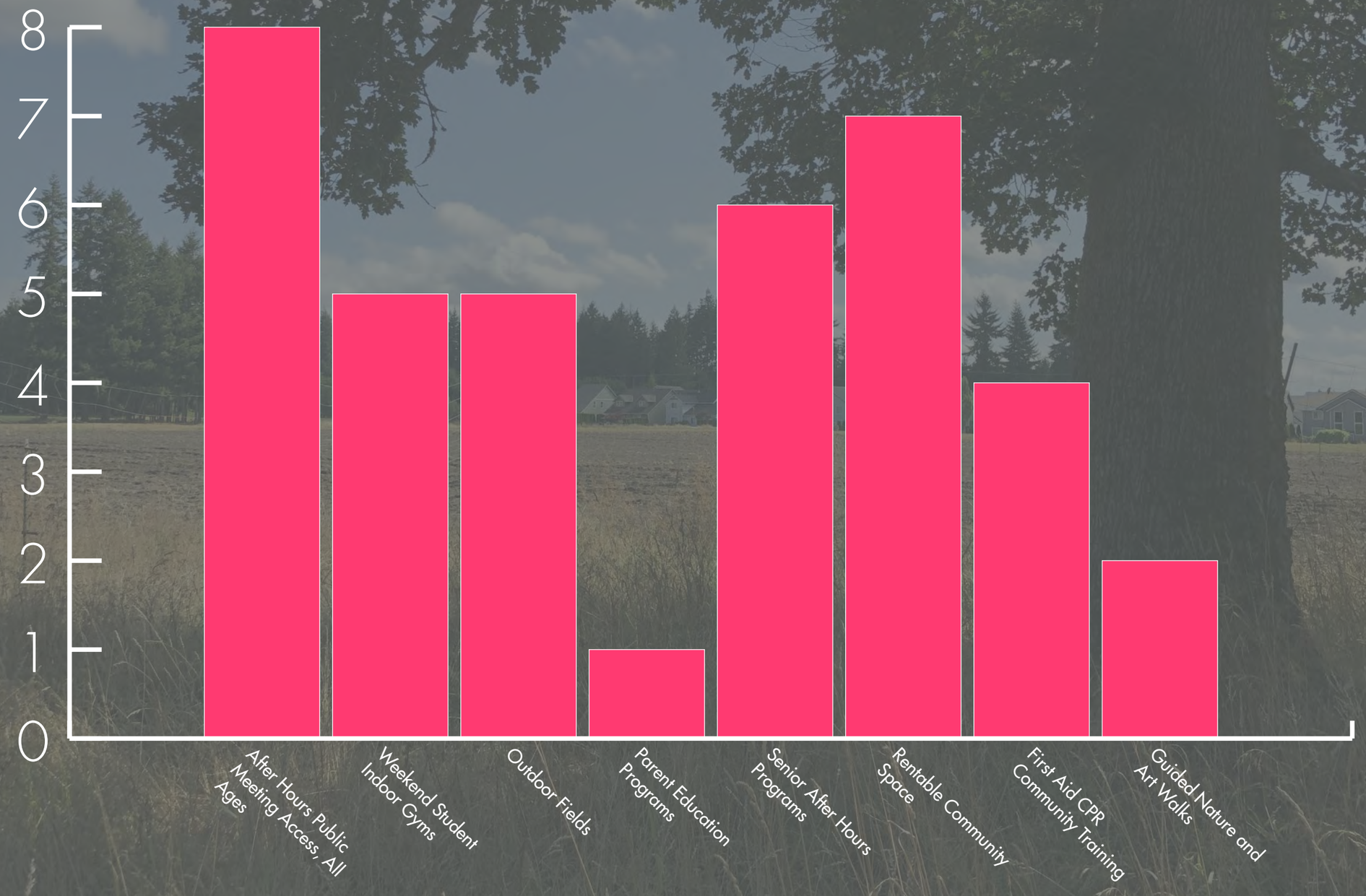
SURVEY SUMMARY

SURVEY QUESTION: What transportation type would you use most?



SURVEY SUMMARY

SURVEY QUESTION: What other activities would benefit the greater community?



B. Environmental Permit Summary Memorandum

SHANNON & WILSON

MEMORANDUM

TO: Matt Martenson

FROM: Amy Summe, PWS

DATE: August 19, 2021

PROJECT: Yelm Highway Community Park Master Plan

PROJ. #: 103284-006

SUBJECT: Environmental Permit Summary

The environment-related permits and approvals identified in Exhibit 1 represent potential requirements for implementation of the actions included in the Yelm Highway Community Park Master Plan (Master Plan).

Since the Project is still in the planning phase and will be implemented in phases over an unknown period of time, the Project may only require some of the permits and approvals listed in Exhibit 1. If code requirements change, additional permits not listed here may be required in the future. The Project is also located in an Urban Growth Area that may be annexed soon into the City of Olympia; different phases of the Project could be permitted in different jurisdictions over time. Accordingly, information below is provided for both Thurston County and City of Olympia environmental permit processes.

Exhibit 1: Summary of Applicable Permits

Agency	Environmental Permit/Approval	Permit Trigger	Supporting Documents
Thurston County	State Environmental Policy Act (SEPA) Determination	As elements of the Plan are taken forward for permits and construction, those activities would require SEPA review as a project action. [Note: the County and City may agree that the City is SEPA lead, or the City and County may be co-leads, even for those project actions within County jurisdiction.]	▪ SEPA Checklist(s) for construction phases ▪ Discipline-specific reports and analyses
	Critical Areas Review Permit	Buffer reductions, construction of trails and related facilities in wetlands and buffers, and activities on documented Mazama pocket gopher sites	▪ Master Application and Other Administrative Actions Supplemental Application ▪ Critical areas report ▪ Mitigation plan

Agency	Environmental Permit/Approval	Permit Trigger	Supporting Documents
	Class IV Forest Practices Act Permit	Removal of timber from a 5,000-square-foot area and conversion of this area to another use	▪ Supplemental Application – Forest Land Conversion ▪ Logging Site Map/Abbreviated Drainage Plan
City of Olympia	SEPA Determination	Adoption of a Master Plan requires environmental review under SEPA as a non-project action. As elements of the Plan are taken forward for permits and construction, those activities would require additional SEPA review as a project action. [Note: the County and City may agree that the City is SEPA lead, or the City and County may be co-leads, for those project actions within County jurisdiction.]	▪ SEPA Checklist for Master Plan ▪ SEPA Checklist(s) for construction phases ▪ Discipline-specific reports and analyses (more important to support the specific project proposals, less so for a master plan)
	Land Use Review (preceded by presubmission conference and pre-intake meeting)	Any new nonresidential and nonagricultural use of land; and the location or construction of any nonresidential or nonagricultural building	▪ Land Use Review Application ▪ Project narrative ▪ Site plan ▪ Conceptual civil engineering plans ▪ Drainage control plan ▪ Landscape and other required studies and plans identified in early meetings
	Critical Areas Review	Buffer reductions, construction of trails and related facilities in wetlands and buffers, and activities on documented Mazama pocket gopher sites	▪ Critical areas report ▪ Mitigation plan
	Hearing Examiner Approval (possibly under a Public Agency and Utility Exception [PAUE])	Trail construction in Category I wetland	▪ Demonstration that there are no practicable or reasonable alternatives (and that other criteria are met if PAUE becomes necessary)
Washington Department of Fish and Wildlife	Hydraulic Project Approval	Work in or over a stream *(these elements are not currently included in the Master Plan)*	▪ Aquatic Protection Permitting System online application ▪ Project and mitigation plan ▪ SEPA determination

Agency	Environmental Permit/Approval	Permit Trigger	Supporting Documents
	401 Water Quality Certification	U.S. Army Corps of Engineers 404 permit *(triggering elements are not currently included in the Master Plan)*	▪ Joint Aquatic Resources Permit Application (JARPA) ▪ Project and mitigation plan
Washington State Department of Ecology	National Pollutant Discharge Elimination System Construction Stormwater General Permit	Ground disturbance of 1 or more acres, and discharges stormwater to surface waters of the State; or smaller projects that discharge stormwater to waters of the State and might cause a violation of any water quality standard	▪ Notice of Intent ▪ Public notice ▪ Stormwater Pollution Prevention Plan ▪ Temporary Erosion and Sediment Control Plan
USACE	Section 404 Clean Water Act (with associated Section 7 Endangered Species Act (ESA) consultation and Section 106 National Historic Preservation Act coordination	Discharge into a water of the U.S. (wetland or stream) *(triggering elements are not currently included in the Master Plan provided any trails in the wetland are limited to boardwalk on pin piles, pre-cast diamond piers, or similar)*	▪ JARPA ▪ Project and mitigation plan ▪ ESA documentation (Biological Assessment or No Effect Letter) ▪ Cultural resources assessment
U.S. Fish and Wildlife Service (USFWS)	Incidental Take Permit consistent with the federal ESA	Activity that could "take"[1] listed Mazama pocket gopher	▪ Habitat Conservation Plan (HCP), including mitigation ▪ Either the USFWS or the City will need to complete an environmental review under the National Environmental Policy Act. Note: The Washington Department of Fish and Wildlife should also be consulted during the HCP development process as the Mazama pocket gopher is designated as a threated species under state law.

Implementation of the Master Plan will also require a variety of building- and engineering-related permits, which will vary depending on which jurisdiction governs the site at the time of application and what elements are included in a given phase.

AJS:MAC:KLW/ajs

[1] The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

C. Critical Areas Report

SUBMITTED TO:
Berger Partnership
1927 Post Alley, Suite 2
Seattle, WA 98101

BY:
Shannon & Wilson
400 N. 34th Street, Suite 100
Seattle, WA 98103

(206) 632-8020
www.shannonwilson.com

CRITICAL AREAS REPORT

Yelm Highway Community Park Master Plan

THURSTON COUNTY, WASHINGTON

SHANNON & WILSON

September 16, 2021

Shannon & Wilson No: 103284-002

Submitted To: Berger Partnership
1927 Post Alley, Suite 2
Seattle, WA 98101
Attn: Mr. Matt Martenson

Subject: CRITICAL AREAS REPORT, YELM HIGHWAY COMMUNITY PARK MASTER PLAN, OLYMPIA, WASHINGTON

Shannon & Wilson prepared this report and participated in this project as a subconsultant to Berger Partnership. Our scope of services was specified on June 28, 2019. This report presents results from our critical areas investigation and was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON, INC.

Merci Clinton, MSEM, PWS
Biologist/Permit Specialist

MAC:AJS:KLW/mac:ajs

CONTENTS

CONTENTS

Exhibits

Figures

Appendices

ACRONYMS

bgs	below ground surface
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DNR	Department of Natural Resources
DP	data plots
Ecology	Washington State Department of Ecology
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
HCP	Habitat Conservation Plan
MPG	Mazama pocket gopher
NWI	National Wetland Inventory
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
PHS	Priority Habitats & Species
Project	The Yelm Highway Community Park Project
TCC	Thurston County Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WSS	Web Soil Survey

1 INTRODUCTION

1.1 Project Location

The Yelm Highway Community Park Project (Project) is located to the south of Yelm Highway Southeast at 3327 Yelm Highway SE, Olympia, Washington 98501 (Section 41/40, Township 18N/17N, Range 1W), parcel numbers 09330005001, 09330005000, 09330006000, and 09330008002 (Figure 1). The project is located in unincorporated Thurston County. The Project site is bordered to the west and east by residential neighborhoods and undeveloped areas and a residential neighborhood delineate the southern border. The site is relatively flat and is partitioned into agricultural and grass fields; one occupied and one vacant residential properties; upland and wetland forest at the south end of the site; and small clusters of trees scattered throughout the northeast, southwest, and middle sections of the site.

1.2 Project Description

The City of Olympia plans to develop the site by constructing playing fields and courts, hiking trails, an off-leash dog park, restroom/storage facilities, light poles and other utilities, stormwater infiltration facilities, and other structures. Figure 2, prepared by Berger Partnership, is the site plan developed for the Project's Master Plan.

1.3 Study Objectives

The objectives of the critical areas study were to:

- Conduct a background review of information relating to the study area.
- Delineate wetlands within the study area.
- Conduct an ordinary high water mark (OHWM) delineation of streams within the study area.
- Assess wetland functions and rate/categorize wetlands and streams within and adjacent to the study area.
- Assess aquatic and upland habitat within the study area.
- Conduct an assessment of Oregon white oak (*Quercus garryana*) and map any oak groves or individual oak trees that meet the definition of "Important Oak Habitat" found in Table 24.25-4 of Chapter 24.25 Thurston County Code (TCC).
- Document Mazama pocket gopher (*Thomomys Mazama*) (MPG) mounds found during the site visits.

- Determine applicable wetland and stream buffer widths required by Chapter 24.25 TCC Fish and Wildlife Habitat Conservation Areas and Chapter 24.30 TCC Wetlands.
- Identify applicable federal, state, and local regulations pertinent to natural resources and geologic hazards.

2 METHODS

2.1 Review of Existing Information

Prior to conducting fieldwork, the following background information was reviewed:

- Thurston County GeoData Center Permitting Map (Thurston County, 2021).
- U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS) Web Soil Survey (WSS) interactive mapping system (USDA NRCS, 2021)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Mapper interactive mapping system (USFWS, 2021)
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) on the Web interactive mapping system (WDFW, 2021a)
- WDFW SalmonScape interactive mapping system (WDFW, 2021b)

2.2 Wetland Delineation, Classification, and Rating

Biologists Amy Summe and Merci Clinton visited the site on June 25 and 26, 2019 and again on July 29, 2021. Potential wetlands were identified using methods described in the U.S. Army Corps of Engineers (Corps) *Wetlands Delineation Manual* (Corps, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (U.S. Army Engineer Research and Development Center, 2010). Ground visual surveys were used to characterize the vegetation (Federal Geographic Data Committee, 2013) and hydrogeomorphic (Brinson, 1993) classifications. The *Washington State Wetland Rating System for Western Washington, 2014 Update* (Hruby, 2014) was used to rate and categorize each wetland unit.

Potential wetland areas within the study area were identified using the triple-parameter approach, which considers vegetation types, soil conditions, and hydrologic conditions. For an area to be considered wetland, it must display each of the following: (a) dominant plant species that are considered hydrophytic by the accepted classification indicators, (b) soils that are considered hydric under federal definition, and (c) indications of wetland hydrology in accordance with the federal definition. Appendix A includes a more detailed summary of the delineation methodology.

Wetland boundaries within the study area were marked with pink wetland delineation flags numbered 1-35 and the wetland and upland data plots (DPs) were marked with yellow flags with polka dots (1-4). Flags were then surveyed by the City of Olympia Department of Public Works.

2.3 Stream Delineation

The OHWM of Chambers Ditch was identified using the Corps' regulatory report, *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (U.S. Army Engineer Research and Development Center, 2014). The OHWM was located using indicators such as vegetation patterns, topography, bank undercutting, and water lines. The portions of Chambers Ditch that cross onto the Project area were marked in the field with orange flags numbered 1 through 18 on the left bank. OHWM boundary flags were then surveyed by the City of Olympia Department of Public Works.

2.4 Important Habitats and Species

TCC 24.25.065 Important Habitats and Species contains regulations governing important habitats and species designated by the state or federal government (TCC 24.25.065.A and B). According to PHS on the Web (WDFW, 2021a), the Project area may contain the following federal- or State-listed species and habitats:

- Priority wetland (see Section 2.2 above)
- Little brown bat (*Myotis lucifugus*) communal roosts, big brown bat (*Eptesicus fuscus*) breeding areas, and Yuma myotis (*Myotis yumanensis*) communal roosts
- MPG
- Coho salmon (*Oncorhynchus kisutch*) and cutthroat trout (*Oncorhynchus clarkii clarkii*)

The Project site was also reviewed for presence of County-designated habitats and species of local importance that may be present, primarily Oregon white oak (TCC 24.25.065.C, Tables 24.25-5 and -5). Oregon white oak is also a State priority habitat, but was not mapped on PHS on the Web. Other species of local importance listed in Table 24.25-5 are not expected in the Project area because they are either strongly prairie-associated (in the case of the designated birds) or have specific stream and forest requirements that are not met at the site (in the case of the designated amphibians).

2.4.1 Oak Tree Assessment

During the site visit, Shannon & Wilson biologists surveyed all parcels associated with the Project for Oregon white oak trees and groves. Trees were identified using common

characteristics including leaf shape, fruit (if found), and tree crown shape. All identified individual trees or groves were marked on a map at their approximate locations and included in the critical areas site plan (Figure 3).

Table 24.25-4 provides the following definition of important oak habitat:

> *Important Oak Habitat means stands of Oregon white oak (Quercus garryana) or oak/conifer associations where canopy coverage of the oak component of the stand is twenty-five percent or more; or where total canopy coverage of the stand is less than twenty-five percent, but oak accounts for at least fifty percent of the canopy coverage. The latter is often referred to as oak savanna. Important oak habitat consists of stands greater than or equal to one acre (0.4 hectares) in size. Single oaks or stands less than one acre (0.4 hectares) shall also be considered an important habitat when found to be particularly valuable to fish and wildlife (i.e. they contain many cavities, have a large diameter at breast height, are used by priority species, or have a large canopy), or are located in degraded habitat areas. Individual oak trees and stands of pure oak or oak conifer associations less than one acre in size that are located in close proximity to an oak habitat larger than one acre may also be considered an important habitat.*

During the 2019 site visits, an assessment of importance was made using Thurston County's definitions.

2.4.2 Mazama Pocket Gopher (MPG) Surveys

WDFW and USFWS jointly offer an MPG training course that provides instruction in the implementation of USFWS' MPG survey protocol (USFWS, 2018). A formal survey to prove absence involves multiple site visits and inspection of the ground along transects spaced 5 meters apart and is only valid through October 31 of the following year. Observation and proper recording of an MPG mound by a biologist trained in the protocol is the only requirement to confirm the occupation of a parcel by MPG. Once occupancy is determined, the parcel will remain listed as occupied and no additional surveys will be required.

In 2019, biologists visited the site to conduct a critical areas inventory, during this time incidental observations of potential MPG mounds were documented, however, because the Project was in its early planning and design stages, the City requested that formal transects required by the MPG survey protocol of MPG be postponed until a later date. In 2021, the Project moved into a new phase, and formal surveys following USFWS' MPG survey protocol were conducted.

Prior to the 2021 field visit, online resources, including Thurston County's GeoData Center Permitting Map (Thurston County, 2021) and WDFW PHS interactive mapping system

(WDFW, 2021a), were reviewed. Thurston County's map showed that all the parcels onsite are mapped as "More Preferred" soils for MPG, meaning that the mapped soil type (Nisqually loamy fine sand) is found on a list included in the protocol as suitable for MPG. WDFW's map showed that several of the parcels onsite, and a number of adjacent parcels, are already listed as occupied (confirmed MPG activity).

MPG mounds were identified and documented by a biologist trained in the MPG protocol (USFWS, 2018). Following the protocol, the site investigation was conducted between June 1 and October 31, mounds and mound groups were mapped using an Eos Arrow GNSS receiver connected to the ArcGIS Collector application , and mound survey data was documented using the USFWS survey form which is included in Appendix B. Documenting a MPG mound (incidentally or during formal surveys) on a parcel listed as not-occupied will update the site to occupied in Thurston County's online permit status lookup, negating the need for additional surveys or transects in the future. Once a parcel is listed as occupied for MPG it cannot be reverted to not-occupied.

2.4.3 Other Wildlife Species

No data sources were located that identified the presence of the priority bats in the Project area or within 600 feet. Indicators of the presence of these species and suitable habitat was looked for during the field effort.

2.5 Geologic Hazard Areas

Geologic hazards were analyzed by reviewing previous subsurface explorations and liquefaction maps provided by the Washington State Department of Natural Resources (DNR's) Washington Geologic information portal (DNR, 2021a).

3 RESULTS

3.1 Review of Existing Information

3.1.1 Terrestrial Wildlife and Habitat

The WDFW PHS interactive mapping system (WDFW, 2021a) shows the occurrence of MPG on parcel number 09330005000 (recorded in 2006 and 2013) and 09330006000 (recorded in 2013) on the Project area and just west of the northwest corner of parcel 09330008002 (recorded in 2014) outside of the Project area. There were also several recorded MPG mounds in the residential neighborhood south of the Project area recorded in 2015 and 2017. MPG is a Thurston County-designated important species, a State-listed Threatened species, and a federally designated Threatened species.

Little brown bat, big brown bat, and Yuma myotis bat species have mapped breeding or communal roosting areas at the township level which incorporates the Project area (Figure 4; WDFW, 2021a). These bats are State priority species.

3.1.2 Aquatic Wildlife and Habitat

Thurston County GeoData Center Permitting Map (Thurston County, 2021) maps the southwestern corner of the study area as wetland and shows Chambers Ditch running along the west side of the study area (Figure 6).

The WDFW PHS interactive mapping system (WDFW, 2021a) and the WDFW SalmonScape interactive mapping system (WDFW, 2021b) list Chambers Ditch as documented presence for coho salmon and residential cutthroat trout (Figure 5). The DNR's Forest Practices Application Mapping Tool also identifies Chambers Creek as Type F (fish-bearing) (DNR, 2021b). Coho salmon and cutthroat trout are State priority species.

The southwest corner of the Project area is also shown on WDFW's PHS interactive mapping system as a priority forested/shrub wetland (WDFW, 2019a). USFWS NWI Mapper interactive mapping system (USFWS, 2021) maps the southwestern corner of the study area as a wetland made up of PSSC (palustrine, scrub-shrub, seasonally flooded), PFOA (palustrine, forested, temporarily flooded), and PEM1C (palustrine, emergent, persistent, seasonally flooded). Chambers Ditch is mapped as a freshwater emergent wetland PEM1C (Figure 7).

3.1.3 Soils

NRCS WSS interactive mapping system (USDA NRCS, 2021) maps the presumed wetland area in the southwest corner of the study area as (70) Mukilteo muck, drained. The rest of the site is mapped as (73) Nisqually loamy fine sand, 0 to 3% slopes; (74) Nisqually loamy fine sand, 3 to 15% slopes; and (20) Cagey loamy sand. Of these soils, (70) Mukilteo muck, drained and (20) Cagey loamy sand are considered hydric. See Figure 8 for the soils map.

Thurston County GeoData Center Permitting Map (Thurston County, 2021) maps the entire study area, outside of the wetland area, as More Preferred for gopher indicator soils (Figure 6). The More Preferred soils mapped on the site include Nisqually loamy fine sand, 0 to 3% slopes and Nisqually loamy fine sand, 3 to 15% slopes.

3.2 Wetland Delineation

During the site visit, one wetland, Wetland A, was delineated within the study area (Figure 3). Wetland Determination Data Forms that provide recorded data for upland and

wetland DPs are included in Appendix C, representative site photos are included in Appendix D, and the wetland rating form and figures are included in Appendix E.

Exhibit 3-1: Summary of Wetlands Delineated in the Study Area

Wetland Name	Size (acres)	USFWS Classification[a]	HGM Classification[b]	Ecology Category[c]	Buffer Width (feet)
A	96.77	PSSC, PSSB, PFOA, PFOB, PEM1H, PEM1C	Depressional	I	260

NOTES:

a. USFWS classification is based on Cowardin (Federal Geographic Data Committee, 2013): palustrine scrub-shrub seasonally flooded and seasonally saturated (PSSC and PSSB), palustrine forested temporary flooded and seasonally saturated (PFOA and PFOB), palustrine emergent persistent permanently flooded and seasonally flooded (PEMIH and PEM1C).

b. Hydrogeomorphic (HGM) classification is based on Brinson (1993).

c. Wetland categories are based on the *Washington State Wetland Rating System for Western Washington, 2014 Update* (Hruby, 2014).

Wetland A is located at the southwestern portion of the study area, extending off the Project site. According to the Cowardin system of classifying wetlands, Wetland A is made up of a mosaic of palustrine scrub-shrub seasonally flooded and seasonally saturated (PSSC and PSSB), palustrine forested temporarily flooded and seasonally saturated (PFOA and PFOB), and palustrine emergent persistent permanently flooded and seasonally flooded (PEMIH and PEM1C). According to the hydrogeomorphic wetland classification system, Wetland A is depressional saturated and flooded wetland (Brinson, 1993).

Vegetation in Wetland A is a mix of emergent, scrub-shrub, and forested vegetation communities. The emergent areas are dominated by reed canarygrass (*Phalaris arundinacea,* FACW) and hardstem bulrush (*Schoenoplectus acutus,* FACW); the scrub-shrub vegetation community is dominated by hardhack (*Spiraea douglasii*, FACW) and; and the forested community is dominated by an overstory of red alder (*Alnus rubra,* FAC) and western red cedar (*Thuja plicata)* with an understory of herbaceous species including skunk cabbage (*Symplocarpus foetidus,* FACW), reed canarygrass, and lady fern (*Athyrium filix-femina,* FAC).

Soils at Wetland A are comprised of a black (7.5YR 2.5/1) matrix with yellowish-red (5YR 5/6) redox concentrations in the matrix at 5% from 0 to 12 inches below ground surface (bgs) and 10% at 12 to 20 inches bgs. The soil profile at DP-2 meets the criteria for the Redox Dark Surface (F6) soil indicator.

Hydrology in Wetland A is influenced by overbank flooding from Chambers Ditch, rainwater, and runoff from the surrounding area. Beavers are known to occupy the site and have created dams at the south end of the wetland near Chambers Creek causing increased inundation. Human interference, including removal of beaver dams and the periodic draining of the wetland to grow blueberries (reported by the property owner and seen in historic imagery), have also altered the hydrology of the site. During the time of the field

visit, the water table was observed at 17 inches bgs and saturation was observed at 8 inches bgs at DP-2.

Wetland A is rated as a Category I wetland (23 total points) according to Washington State Department of Ecology's (Ecology's) wetland rating manual (Hruby, 2014) (Appendix E) based on functions associated with depressional wetlands. Wetland A scored high for habitat site potential, low for habitat landscape potential, and high for habitat value, for a total of 7 habitat points.

3.3 Stream Delineation

During the site visit, one stream, Chambers Ditch, was delineated within the study area (Figure 3). Representative site photos are included in Appendix D.

Chambers Ditch runs from north to south along the western edge of parcel 09330008002, through Wetland A, terminating in Chambers Creek at the southwest corner of Wetland A. Chambers Ditch has documented occurrence and migration of coho salmon and cutthroat trout (WDFW, 2021a and 2021b). Based on documented fish presence, the ditch is classified as a Water Type F under Washington Administrative Code 222-16-030 and Type F under TCC 24.25.020. Buffers were determined based on Thurston County's stream type and bankfull width (>5 feet) (Exhibit 3-2).

Exhibit 3-2: Summary of Streams Delineated in the Study Area

Stream Name	Water Type[a]	Stream Type[b]	County Buffer Width (feet)[c]
Chambers Ditch	Type F	F	200

NOTES:

a. Water type is based on Washington Administrative Code 222-16-030.
b. Stream type is based on TCC 24.25.020.
c. Buffer width is based on TCC 24.25.020.

3.4 Uplands and Buffers

The upland portions of the study area, including stream and wetland buffers, are comprised of tilled agricultural land, a vacant residence and an occupied rural residence with associated structures, and planted and natural forested areas. The naturally vegetated areas are dominated by an overstory of Douglas-fir (*Pseudotsuga menziesii*, FACU), western red cedar, big leaf maple (*Acer macrophyllum*, FACU), and red alder; an understory of mixed shrubs and woody vines including osoberry (*Oemleria cerasiformis*, FACU) and small amounts of invasive Himalayan blackberry; and an herbaceous layer dominated by reed canarygrass and other grasses, sword fern (*Polystichum munitum*, FACU), and other mixed native and non-native species. Of particular note was a large patch of Scotch broom at the

northeast corner of the upland forest. The upland forest contains a few snags, with abundant indicators of use by birds for foraging and possible nesting.

Soils in the upland plots (DP-1, DP-3, and DP-4) are comprised of a black (7.5YR 2.5/1) matrix. Yellowish-brown (10YR 4/6) concentrations at 1% were found in DP-4. No saturation or high water tables were observed at any of the upland data plots.

3.5 Important Habitats and Species Surveys

3.5.1 Oak Tree Assessment

Two small pockets of Oregon white oak trees and a single oak were documented within the study area. Both small stands are located on parcel number 09330008002 (Figure 3) and the single oak is located at the boundary of parcels 09330008002 and 09330005000. No other single oak or oak groves were observed.

Based on the definition provided above in Section 2.4.1, the few oaks in the Project area could be considered important habitat based on their large size and canopy, although neither WDFW nor TCC provide dimensional requirements. The oaks may also be considered to be in "degraded habitat" as they are next to a single-family residence and agricultural uses.

3.5.2 Mazama Pocket Gopher (MPG) Surveys

3.5.2.1 2019

During the 2019 site visits, five MPG mound groups were documented across parcel 09330008002. All mounds found were incidental and documented following USFWS protocol using survey data sheets developed by USFWS (Appendix B). Based on USFWS protocols, it only takes one documented MPG mound to classify a parcel as occupied by MPG. Based on information mapped on PHS on the Web (WDFW, 2021a) (occurrence of MPG on parcel number 09330005000 and 09330006000) and findings during the site visit (MPG mounds documented on parcel 09330008002), all parcels associated with the Project except for parcel 09330005001 were initially considered occupied by MPG.

3.5.2.2 2021

In 2021, the biologists completed an official survey to support either development of a Project-specific Habitat Conservation Plan[1] (HCP) or Project authorization under the

[1] A Habitat Conservation Plan is a document prepared pursuant to Section 10 of the federal Endangered Species Act. It contains agreed impact minimization and compensation measures to allow some level of potential harm to federally listed species.

County's future HCP. As determined in 2019, occurrence of MPG on parcel number 09330005000 and 09330006000 had already been documented by WDFW and therefore the survey focused on the remaining parcels 09330008002 and 09330008002. During the site visit, MPG mounds were documented on both parcels; three mound groupings were found on 09330005001 (Figure 9) and over 100 mound groupings (which equates to several thousand individual mounds) were found on parcel 09330008002 (Figure 10). Gopher activity on the parcels appeared to be ongoing, with fresh mounds appearing on top of older mounds across the site.

3.5.3 Other Wildlife Species

PHS on the Web (WDFW, 2019a) showed communal roosts for the little brown bat and the Yuma myotis bat and a breeding area for the big brown bat at the Township scale that includes the Project area. Larger communal roost sites, including maternity roosts, are found in buildings, caves, old mines, and under bridges, trestles, or piers. The largest known maternity roost of little brown bat in Washington State is under an abandoned railroad trestle near Olympia (Hayes and Wiles, 2013). This same location is shared with one of the largest Yuma myotis bat roosts (Hayes and Wiles, 2013). Bats also use trees that have cavities or crevices, but these sites are not typically long-term habitats and may be part of a chain of sites. The Project contains a few trees that might provide some limited roosting opportunities in the upland forest and forested wetland. Both myotis species prefer sites near water, which is provided by Wetland A and Chambers Ditch. The residential buildings and associated outbuildings may also be suitable, if measures haven't been taken to prevent access.

Based on site conditions, the Project area is unlikely to provide roosting opportunities for large numbers of bats.

3.6 Geologic Hazard Areas

Geologic hazards were investigated and documented by a Shannon & Wilson geotechnical engineer. Earthquake-induced geologic hazards that may affect a given project site include landsliding, fault rupture, and the associated effects of liquefaction (such as loss of shear strength, bearing capacity failures, loss of lateral support, ground oscillation, settlement, and lateral spreading). Based on review of previous subsurface explorations and liquefaction maps provided by DNR, the risk of liquefaction and its effects due to seismic activity is considered low. There is also little risk of a seismically induced landslide due to the relatively flat topography of the Project site. The potential for fault rupture is low, given that there are no mapped faults within the immediate vicinity of the Project site. The nearest mapped fault is the northwest-southeast-trending Olympia Structure, located about 2 miles away.

4 REGULATIONS

4.1 Thurston County

Thurston County requires a Critical Areas Review Permit "for all development permits for properties that may be impacting critical areas and associated buffers" (TCC 24.40.010). The permit application and supporting documents are reviewed by Thurston County's Resource Stewardship Department.

4.1.1 Wetland Regulations

The study area contains one wetland, Wetland A. Thurston County classifies wetlands into one of four categories (I through IV) based on the most recent version of Ecology's wetland rating system for Western Washington (TCC 24.30.030). See Appendix E for the Wetland Rating Form.

Wetland A is a Category I wetland based on a total score of 23. Thurston County assigns buffers to wetland areas based on the wetland category and the habitat score from the wetland rating form under the *Washington State Wetland Rating System for Western Washington* (Hruby, 2014) (TCC 24.30.045). The habitat rating for the assessed functions was as follows: high site potential, high functional value, and low landscape potential (H,H,L).

For wetlands with H,H,L habitat ratings, the standard buffer is 260 feet. Thurston County code allows for reducing the standard buffer width to 195 feet if mitigation is conducted following TCC 24.30.050, specifically applying the mitigation measures identified in TCC Table 24.30-2, and the applicant can demonstrate that "the proposed reduction in buffer width, coupled with the proposed mitigation plan, would result in better protection of the wetland or better wetland or buffer functions than the standard buffer without such enhancement."

In addition to the general buffer preservation, Thurston County requires tree protection in buffers for wetlands that score 5 points or higher on the habitat rating (this would include Wetland A). This means that "*Trees within wetland buffers with driplines that extend beyond the upland edge (furthest from the wetland)… shall be protected"* (TCC 24.30.065). Protection would entail creating a "tree area extending a minimum of five feet beyond the dripline of trees twelve inches or greater in diameter" at breast height that would preclude clearing, grading, filling, vehicle travel, parking, storage, or other development activities and would be required to be identified in site development plans.

After the application of the standard mitigation sequencing process, including to first avoid the wetland and wetland buffer and second to minimize impacts, remaining adverse

impacts to wetlands and buffers require compensatory mitigation (TCC 24.30.070 and -.075). Buffer mitigation is required at a 1:1 ratio, and wetland mitigation is required at ratios that vary based on the wetland category and the type of compensation.

Preliminary Project objectives include avoidance of both direct and indirect adverse impacts to Wetland A and limited intrusions into the buffer of Wetland A to support passive recreation and educational opportunities and to install a fire safety access loop around the proposed park facilities. The fire safety access loop has been located so that it is just outside of the reduced buffer width (195 feet) allowed under TCC 24.30.050 as described above. Wetland buffers must generally be preserved in their existing condition, but there are a few allowed modifications and uses subject to a critical areas review permit. Trails and trail-related facilities, for example, are allowed in buffers provided certain standards are met (TCC 24.30.085).

4.1.2 Stream Regulations

Stream buffers are based on the stream rating system that categorizes streams as Types S, F, Np, and Ns based on mean annual flow, stream channel width, presence of fish, and annual duration of flow. Chambers Ditch has a mean annual flow of less than 20 cubic feet per second, so it is not a Type S (Shoreline) water. A number of agency resources indicate that it contains fish, so it is classified as Type F (fish-bearing). Type F streams with a channel width between 5 and 20 feet require a 200-foot buffer (TCC 24.25.020, Table 24.25-1).

An additional 50-foot riparian management zone measured from the upland edge of the stream buffer has additional limitations on use and alteration. Reduction of a buffer on Type F streams requires a reasonable use exception.

Preliminary Project objectives include avoidance of all direct and indirect adverse impacts to Chambers Ditch and only limited intrusions into its buffer to support passive recreation and educational opportunities. Stream buffers must generally be preserved in their existing condition, but there are a few allowed modifications and uses subject to a critical areas review permit. Trails and trail-related facilities, for example, are allowed in buffers provided certain standards are met (TCC 24.25.270).

4.1.3 Oak Tree Regulations

The few on-site oaks may meet the criteria for a WDFW priority habitat[2] and are a local habitat of importance. As stated in TCC 24.25.360, "Removal of native vegetation within priority habitat, marine riparian habitat areas, and riparian habitat areas shall be prohibited

[2] Because the WDFW definition does not provide dimensions for what constitutes a "large" diameter at breast height or a "large" canopy, a determination cannot be made definitively.

except as provided for in this chapter." Oak-specific regulations in TCC 24.25.370 govern removal of Douglas-fir in oak woodlands and thinning of oaks in oak savanna when the activity would benefit the habitat. The Project area does not include oak woodlands or oak savannas as defined in TCC 17.15.200 and therefore regulations in TCC 24.25.370 are not applicable.

WDFW developed the following management recommendations for white oaks (edited to list only those potentially applicable to the Project area) (Larsen and Morgan, 1998):

- Do not cut Oregon white oak woodlands except for habitat enhancement.
- Allow low-impact recreation (hunting, fishing, hiking, and mushroom and acorn collecting).
- Thin encroaching conifers in oak woodlands west of the Cascades.
- Retain large, dominant oaks and standing dead and dying trees.
- Leave fallen trees, limbs, and leaf litter for foraging, nesting, and denning sites.
- Retain contiguous aerial pathways.

4.1.4 Mazama Pocket Gopher (MPG) Regulations

The MPG already mapped on portions of the Project area and the newly identified MGP located during development of this report are an important animal species regulated under Chapter 24.25 TCC. TCC 24.25.075 requires an assessment of impacts and development of case-specific buffers based on available WDFW management recommendations. The MPG management recommendations (WDFW, 2011) emphasize avoidance, proposing a buffer of 18.5 feet around each mound and then tripling the buffer area to comprise a defined "habitat protection area." Additional recommendations describe potential fencing, signage, vegetation management, chemical use, and other measures to preserve the habitat protection area. However, because the MPG is a federally listed species, the WDFW management recommendations have less authority.

Thurston County is currently working with USFWS to create a countywide HCP, which is anticipated to be completed in Spring 2022. The City will coordinate with the County and USFWS to identify whether the proposed Project could utilize the County's HCP or should develop a Project-specific HCP.

4.2 State of Washington

4.2.1 401 Water Quality Certification

Ecology has been authorized to implement Section 401 of the Clean Water Act (CWA) for Water Quality Certification in Washington for most projects that require Corps permits

under CWA Section 404 (see Section 4.3). Typically, projects requiring a CWA Section 404 permit also require a CWA Section 401 Water Quality Certification.

The purpose of the certification process is to ensure that federally permitted activities comply with the federal CWA, state water quality laws, and any other applicable state laws. Some general requirements for Section 401, if it is required, include pollution spill prevention and response measures, disposal of excavated or dredged material in upland areas, use of fill material that does not compromise water quality, clear identification of construction boundaries, and provision for site access to the permitting agency for inspection.

The master plan currently does not include any activities that would require an Ecology 401 Water Quality Certification.

4.2.2 National Pollutant Discharge Elimination System (NPDES)

Projects that disturb more than one acre and discharge stormwater to surface waters of the State, or that meet other criteria, must obtain authorization under Section 402 of the federal Clean Water Act. Section 402 establishes NPDES permits and is administered in Washington State by Ecology. Obtaining a Construction Stormwater General Permit from Ecology under Section 402 requires submittal of a Notice of Intent, publication of a public notice, and development of a Stormwater Pollution Prevention Plan.

4.3 Federal

The Corps' CWA Section 404 review process is required for projects involving discharges of dredged or fill material into the waters of the United States, including streams and non-isolated wetlands. Any proposed impact located within a jurisdictional wetland or stream would require either a Nationwide Permit or an Individual Permit from the Corps.

Projects that require or trigger a federal permit from the Corps would also require review and approval under the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, and the National Historic Preservation Act.

The Master Plan currently does not include any activities that would require a Corps Section 404 authorization. Installation of a boardwalk within wetlands if it is supported by piles or pre-cast diamond piers, or similar, is not considered fill material.

5 POTENTIAL CRITICAL AREAS IMPACTS

Master Plan design objectives included avoidance and minimization of direct adverse impacts to critical areas, consistent with the achievement of park objectives. To date, this has included reconfiguration of some early concepts to keep the fire safety access loop outside of the reduced buffer and rearrangement of the various ballfield and other recreational amenities to remove those facilities from buffers. The Project design is still underway; a detailed description of mitigation sequencing efforts and outcomes will be provided for each phase of project implementation with an impact analysis and an appropriate mitigation plan. At this Master Plan level, potential stream, wetland, and buffer impacts may be limited to the following (see Figure 2):

- Installation of a fire safety access loop around the proposed park facilities through farmed areas of Wetland A's buffer. The fire safety access loop has been located so that it is just outside of the County's reduced buffer width (195 feet).
- Limited intrusions by trails and a ropes-course-type nature play space in the outer portions of Wetland A's buffer in areas that would require disturbance of primarily herbaceous upland and no tree removal.
- Construction of a raised boardwalk through Wetland A, field located to avoid tree removal.
- Construction of trails in the buffer of Chambers Ditch.

As the entire site outside of forested and wetland areas is considered habitat for MPG, avoidance of adverse impacts to MPG is not feasible without compromising the purposes of the public park project.

The Master Plan design has taken care to avoid removal of or harm to native oak trees.

6 MITIGATION AND RESTORATION OPPORTUNITIES

Depending on the nature and extent of potential impacts, the following mitigation or restoration opportunities have been identified:

- Enhance Wetland A by ceasing mowing and active modifications that have supported blueberry production.
- Enhance Wetland A by introducing native trees and shrubs where hydrology allows.
- Enhance the buffer of Wetland A and Chambers Ditch by introducing native trees and shrubs in non-native herbaceous areas that have been previously farmed or cleared. Buffer enhancement will need to consider the competing needs of MPG habitat.

- Preserve oak trees and consider planting additional native oak.
- Restore some sinuosity and instream habitat features (e.g., large woody debris) in Chambers Ditch.

As noted above, impact analysis and an appropriate mitigation plan will be provided as different phases are brought forward from the Master Plan for final design and permitting.

7 REFERENCES

Brinson, M.M., 1993, A hydrogeomorphic classification for wetlands: U.S. Army Corps of Engineers Waterways Experiment Station Wetlands Research Program Technical Report WRP-DE-4, NTIS Report no. AD-A270053, 101 p.

Bunten, D., R. Mraz, L. Driscoll and A. Yahnke, 2016, Wetland Guidance for CAO Updates: Western Washington Version. Publication No. 16-06-001. June. Available: https://apps.ecology.wa.gov/publications/documents/1606001.pdf

Federal Geographic Data Committee, 2013, Classification of Wetlands and Deepwater Habitats of the United States, Adapted from Cowardin, Carter, Golet and LaRoe (1979), available: https://www.fgdc.gov/standards/projects/wetlands/nwcs-2013

Hayes, G., and Wiles, G.J., 2013, Washington bat conservation plan. Washington Department of Fish and Wildlife, Olympia, Washington. 138+viii p. Available: https://www.fs.fed.us/r6/sfpnw/issssp/documents2/cpt-ma-bats-wa-conservation-plan-2013-06.pdf

Hruby, Thomas, 2014, Washington State wetland rating system for western Washington: 2014 update (effective January 2015): Olympia, Wash., Washington State Department of Ecology, Publication no. 14-06-029, 164 p., available: https://fortress.wa.gov/ecy/publications/SummaryPages/1406029.html

Larsen, E.M., and Morgan, J.T., 1998, Management recommendations for Washington's priority habitats: Oregon white oak woodlands. Wash. Dept. Fish and Wildl., Olympia, 37 p. Available: https://wdfw.wa.gov/sites/default/files/publications/00030/wdfw00030.pdf

Thurston County, 2019, Thurston GeoData Center - Online Maps: Permit Maps, accessed September 4, 2019, at https://map.co.thurston.wa.us/Html5Viewer/Index.html?viewer=Permitting.Main.

U.S. Army Corps of Engineers (Corps), 1987, Corps of Engineers wetlands delineation manual: Vicksburg, Miss., U.S. Army Corps of Engineers, Technical Report Y-87-1, 169 p., available: http://www.cpe.rutgers.edu/wetlands/1987-army-corps-wetlands-delineation-manual.pdf.

U.S. Army Engineer Research and Development Center, 2010, Regional supplement to the Corps of Engineers wetland delineation manual: western mountains, valleys, and coast region (v. 2.0): Vicksburg, Miss., U.S. Army Corps of Engineers U.S. Army Engineer Research and Development Center, Report ERDC/EL TR-10-3, 151 p., available: http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/reg_supp.aspx.

U.S. Army Engineer Research and Development Center, 2014, A guide to ordinary high water mark (OHWM) delineation for non-perennial streams in the western mountains, valleys, and coast region of the United States: Vicksburg, Miss., U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Report ERDC/CRREL TR-14-13, 50p., available: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp_aug2014.pdf.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS), 2021, Web soil survey, available: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx, accessed September 2021.

U.S. Fish and Wildlife Service (USFWS), 2018, Mazama Pocket Gopher Screening Protocol Checklist. April 19. Available: https://www.fws.gov/wafwo/documents/MPG%20Screening%20Protocol%20Checklist%204_20_18.pdf.

U.S. Fish and Wildlife Service (USFWS), 2021, National wetlands inventory wetlands mapper: available: http://www.fws.gov/wetlands/Data/Mapper.html, accessed September 2021.

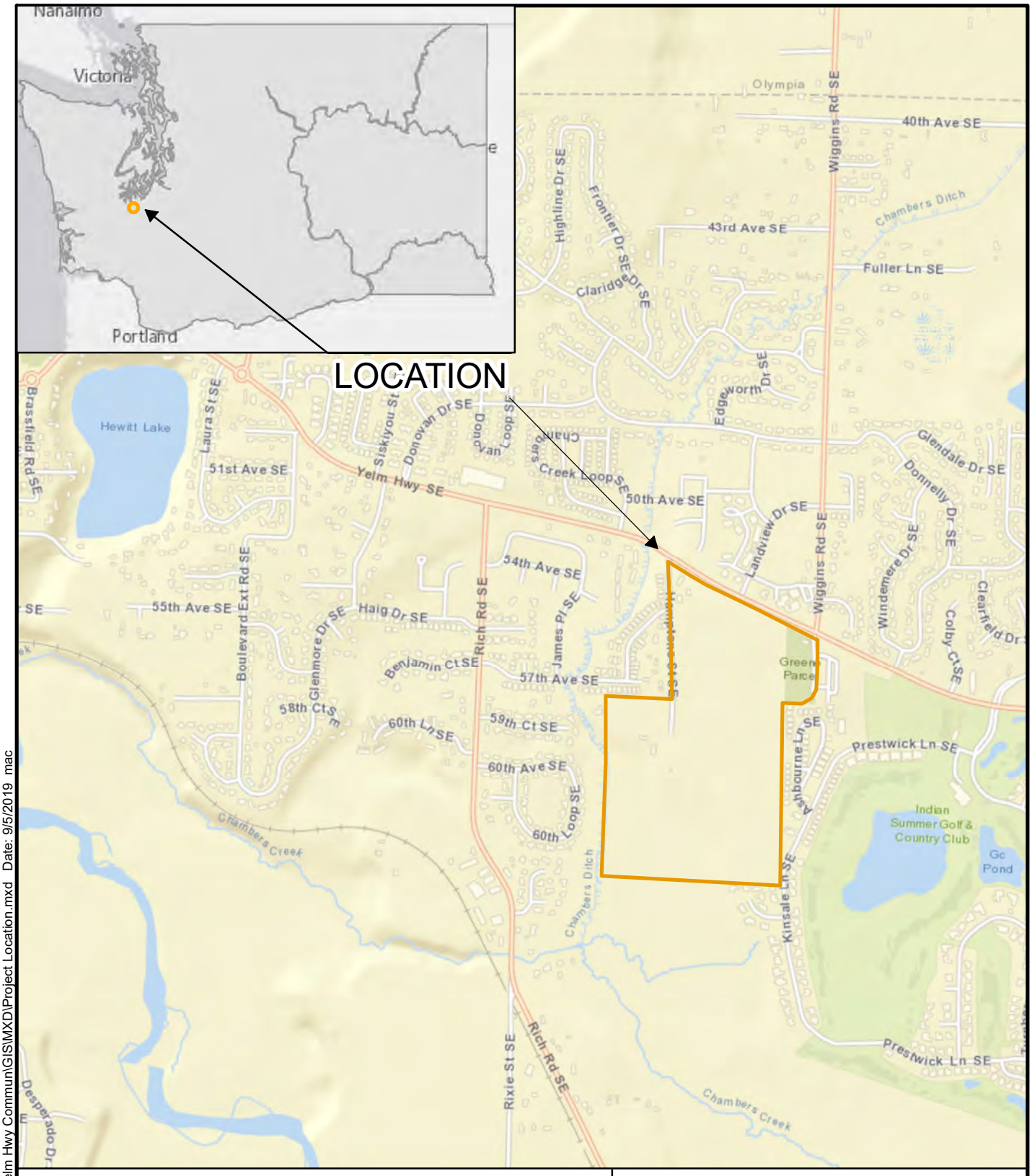
Washington Department of Fish and Wildlife, 2011, Priority Habitats and Species Management Recommendations: Mazama Pocket Gopher. March. Available: https://wdfw.wa.gov/sites/default/files/publications/01175/wdfw01175.pdf

Washington State Department of Fish and Wildlife (WDFW), 2021a, PHS on the Web: Olympia, Wash., Washington State Dept. of Fish and Wildlife, available: http://apps.wdfw.wa.gov/phsontheweb/, accessed September 2021.

Washington State Department of Fish and Wildlife (WDFW), 2021b, SalmonScape web application: Olympia, Wash., Washington State Dept. of Fish and Wildlife, available: http://apps.wdfw.wa.gov/salmonscape/map.html, accessed September 2021.

Washington State Department of Natural Resources (DNR), 2019a, Washington Geologic Information Portal, accessed September 2021, at https://geologyportal.dnr.wa.gov/#natural_hazards.

Washington State Department of Natural Resources (DNR), 2021b, Forest practices application mapping tool. Olympia, Wash., Washington State Dept. of Natural Resources, available: https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html, accessed September 2021.



Legend

Project Location

N
W E
S

0 625 1,250 2,500
Feet

Yelm Community Park Master Plan
Olympia, Washington

Vicinity Map

October 2019 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Community\GIS\MXD\Project Location.mxd Date: 9/5/2019 mac

berger PARTNERSHIP
1927 Post Alley, Ste. 2
Seattle, WA 98101
206 325 6877
bergerpartnership.com

Yelm Highway Community Park - Phase 1

Olympia Parks, Arts and Recreation

3327 Yelm Hwy SE, Olympia, WA 98501

SET TYPE:
DRAFT 30% DESIGN

SET ISSUE DATE:
2021/09/08

REVISIONS:
Δ DESCRIPTION DATE

DRAWN/CHECKED:
SB, MM / AM

SHEET NAME:
MASTER PLAN

SHEET NUMBER:
L-000

Berger Partnership Project Number: Project Number
Plotted: 9/13/20

Legend

- Parcels
- Wetland A
- Wetland A buffer 260 ft. **
- OHWM
- Project Bounds
- Stream Buffer 200 ft.
- Oaks
- Onsite Parcels with Confirmed MPG Presence
- MPG Mounds discovered during site visit
- MPG: WDFW PHS confirmed occurance*

N W E S

Notes:
* MPG WDFW PHS confirmed occurrence information pulled from PHS on the Web. Points indicated general location of previously documented mounds.

** For wetlands with H,H,L habitat ratings, the standadbuffer is 260 feet. Thurston County code allows for reducing the standard buffer width to 195 feet if mitigation is conducted following TCC 24.30.050.

Yelm Community Park Master Plan
Olympia, Washington

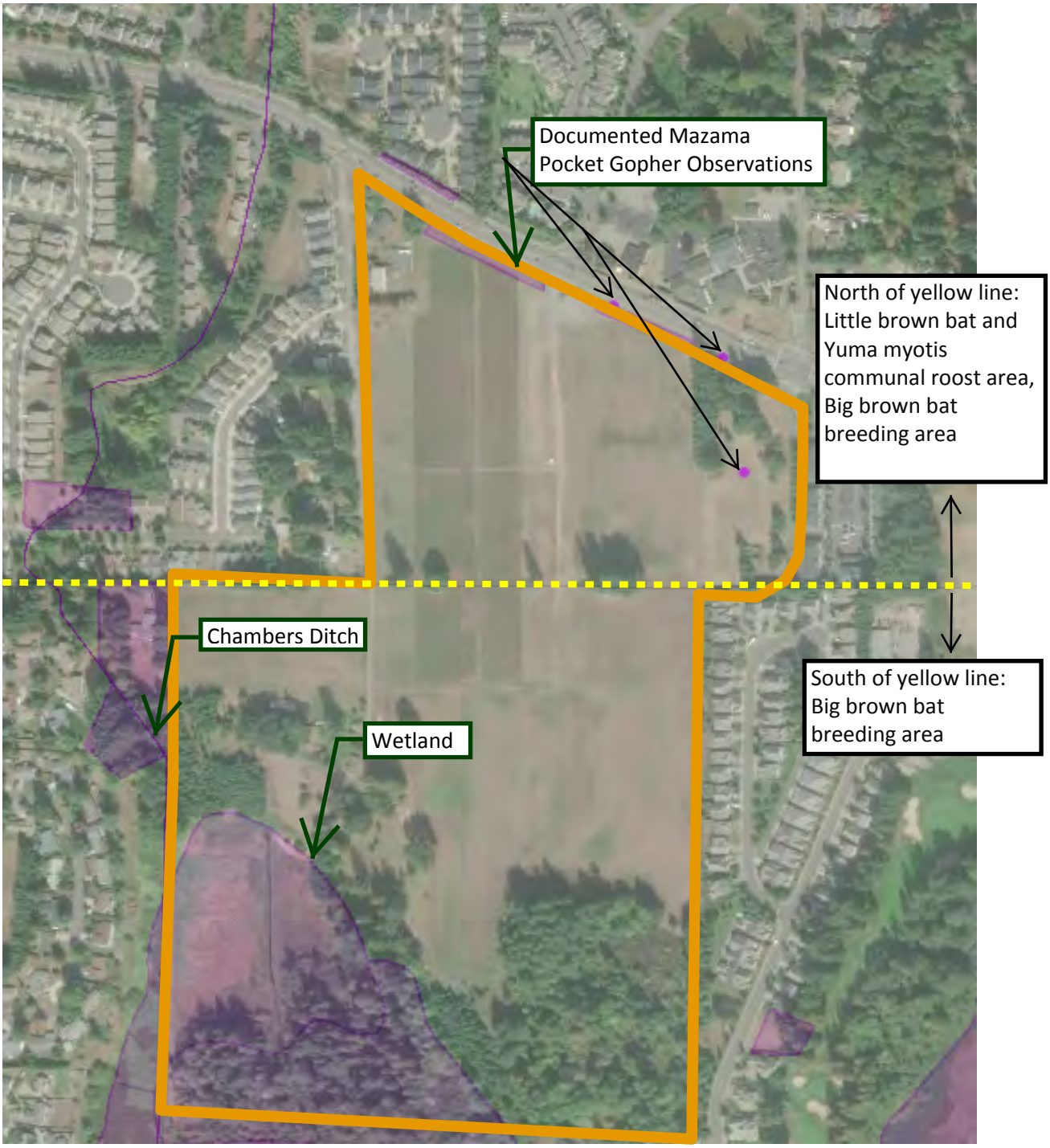
CRITICAL AREA SITE PLAN

September 2021 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 3

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Communi\GIS\MXD\Site Plan_update_2021.mxd Date: 9/15/2021 MAC



Legend

Project Location

N
W E
S

Note: Map screenshot aquired from PHS on the Web: http://apps.wdfw.wa.gov/phsontheweb/, on 10/1/2019.

Yelm Community Park Master Plan
Olympia, Washington

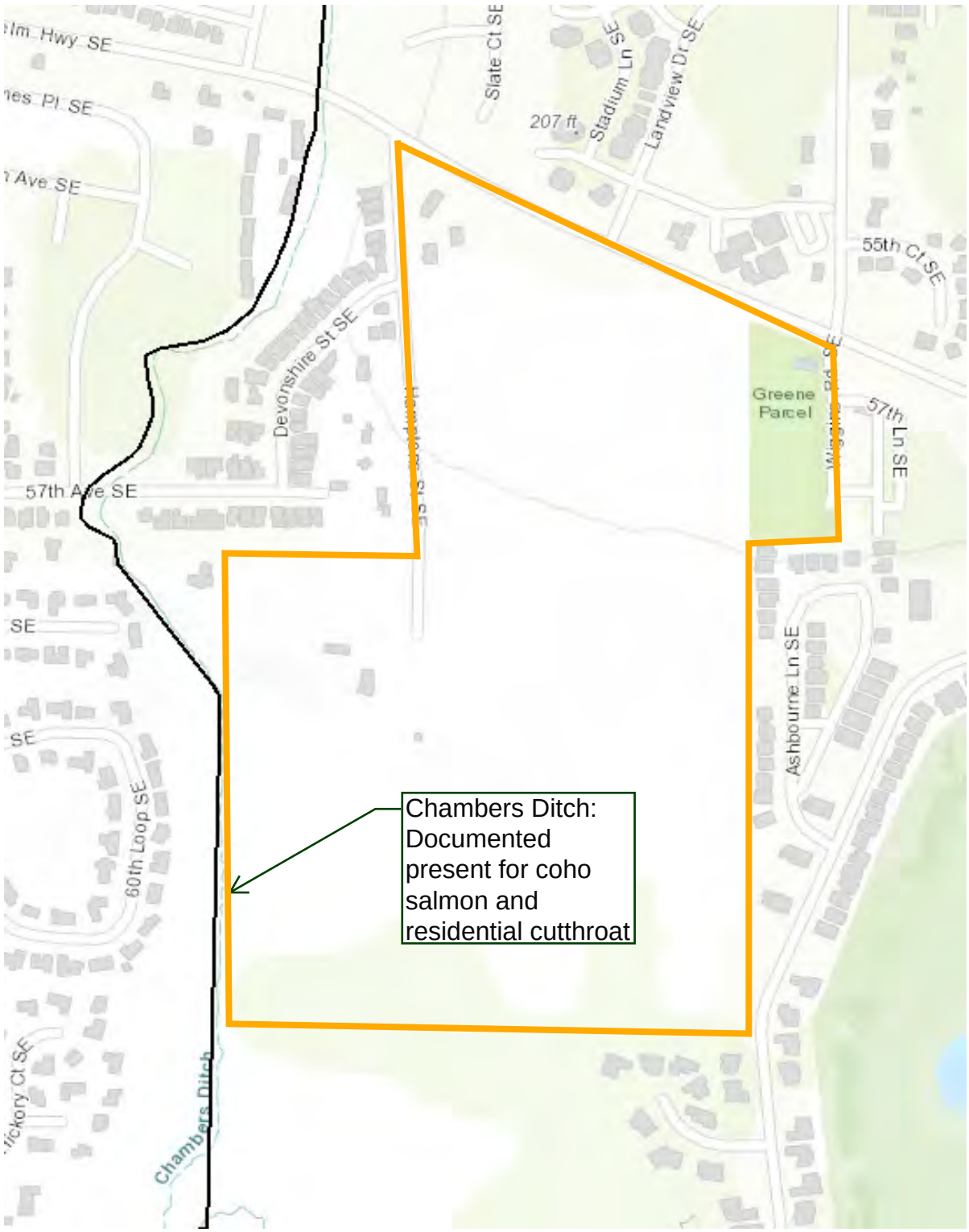
WDFW PHS Map

September 2021 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 4

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Community\GIS\MXD\Project Location.mxd Date: 9/5/2019 mac



Legend

Project Location

N
W E
S

Note: Map screenshot aquired from SalmonScape: http://apps.wdfw.wa.gov/salmonscape/map.html, on 10/1/2019.

Yelm Community Park Master Plan
Olympia, Washington

SalmonScape Map

September 2021 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Community\GIS\MXD\Project Location.mxd Date: 9/5/2019 mac

Legend

Project Location

N
W E
S

Note: Map screenshot aquired from Thutston County Permitting Map: https://map.co.thurston.wa.us/Html5Viewer/Index.html?viewer=Permitting.Main, on 10/1/2019.

Yelm Community Park Master Plan
Olympia, Washington

Thurston County GeoData Center
Permitting Map

September 2021 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Community\GIS\MXD\Project Location.mxd Date: 9/5/2019 mac

Legend

Project Location

PSSC: palustrine, scrub-shrub, seasonally flooded
PFOA: palustrine, forested, temporarily flooded
PEM1C: palustrine, emergent, persistent, seasonally flooded

Note: Map screenshot aquired from National Wetlands Inventory Map: https://www.fws.gov/wetlands/data/mapper.html, on 10/1/2019.

N
W E
S

Yelm Community Park Master Plan
Olympia, Washington

National Wetland Inventory Map

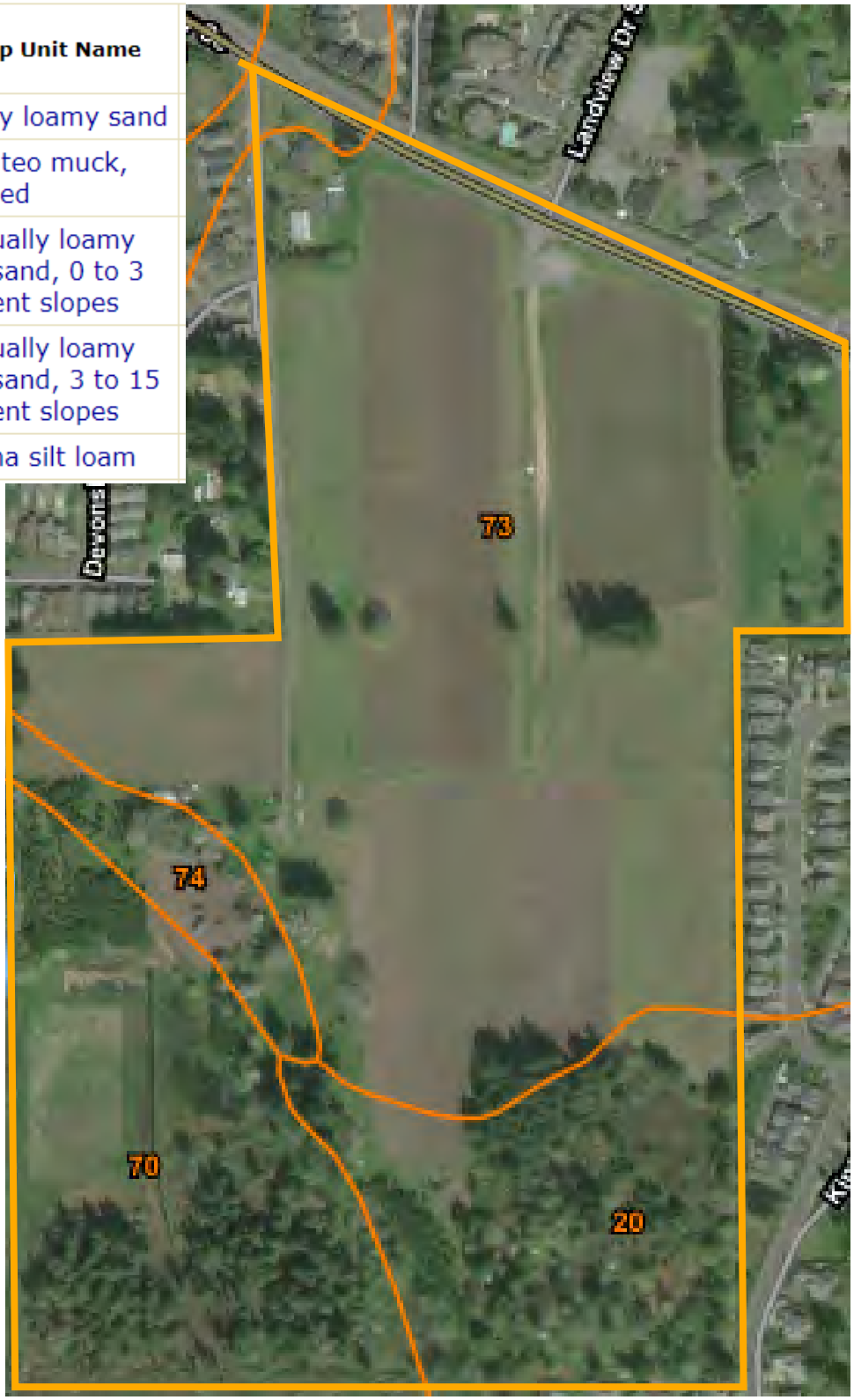
September 2021 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 7

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Community\GIS\MXD\Project Location.mxd Date: 9/5/2019 mac

Map Unit Symbol	Map Unit Name
20	Cagey loamy sand
70	Mukilteo muck, drained
73	Nisqually loamy fine sand, 0 to 3 percent slopes
74	Nisqually loamy fine sand, 3 to 15 percent slopes
76	Norma silt loam



Legend

Project Location

N
W E
S

Note: Map screenshot aquired from NRCS Web Soil Survey: https://websoilsurvey.sc.egov.usda.govAppWebSoilSurvey.aspx, on 10/1/2019.

Yelm Community Park Master Plan
Olympia, Washington

National Resource Conservation Service Web Soil Survey Map

September 2021 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

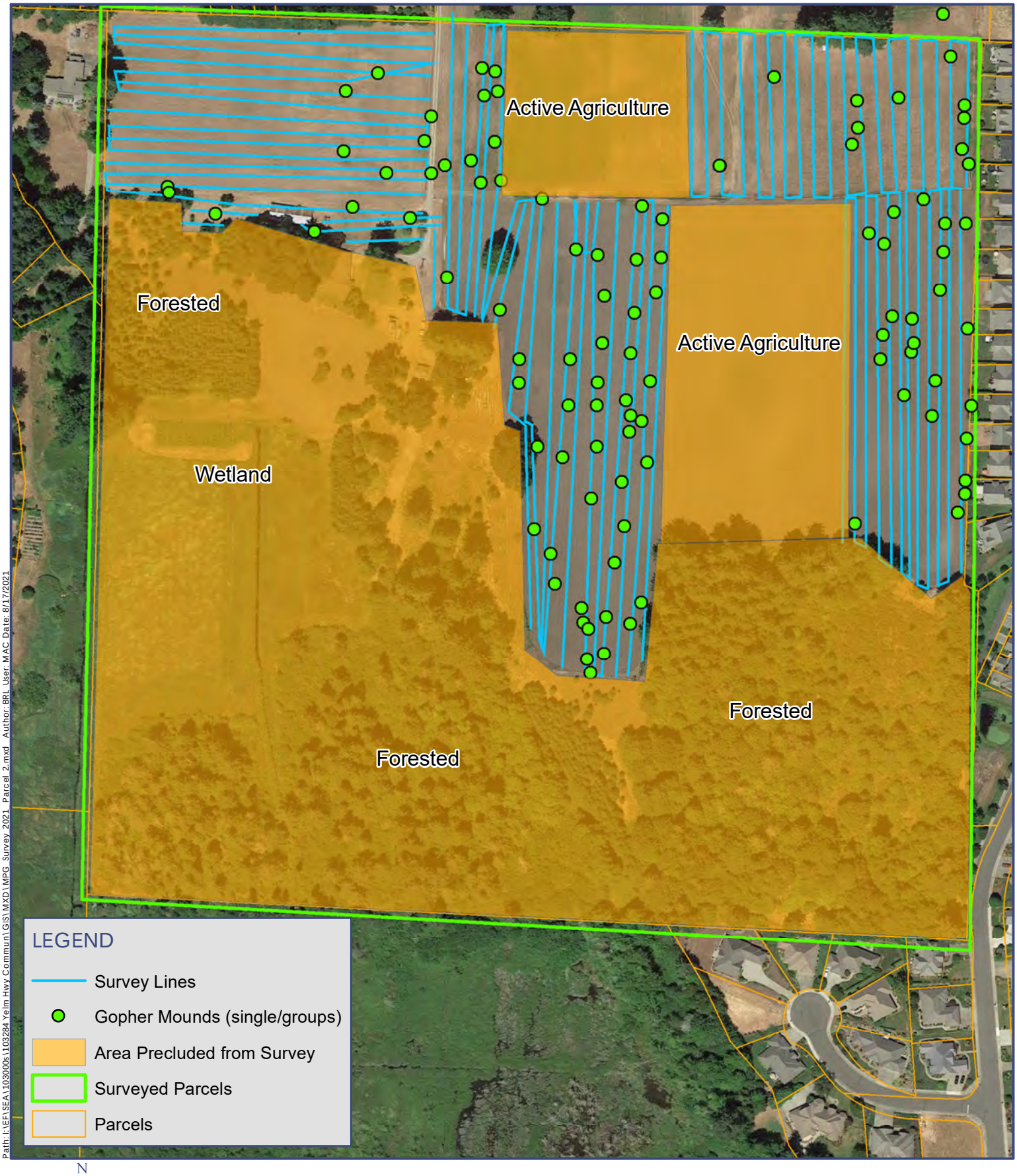
FIG. 8

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Community\GIS\MXD\Project Location.mxd Date: 9/5/2019 mac

Path: I:\EF\SEA\103000s\103284 Yelm Hwy Commun\GIS\MXD\MPG_Survey 2021_Parcel 1.mxd Author: BRL User: MAC Date: 8/17/2021

September 2021
Survey Map
Parcel 09330005001

Figure 9



Path: I:\ER\SEA\103000s\103284 Yelm Hwy Commun\GIS\MXD\MPG_Survey 2021_Parcel_2.mxd Author: BRL User: MAC Date: 8/17/2021

September 2021

Survey Map

Parcel 09330008002

Figure **10**

APPENDIX A: WETLAND DELINEATION METHODOLOGY

Appendix A

Wetland Delineation Methodology

APPENDIX A: WETLAND DELINEATION METHODOLOGY

Appendix A

WETLAND DELINEATION METHODOLOGY

CONTENTS

APPENDIX A: WETLAND DELINEATION METHODOLOGY

A.1 INTRODUCTION

The triple-parameter approach, as required in the Washington State Department of Ecology's (Ecology's) 1997 Washington State Wetlands Identification and Delineation Manual, the U.S. Army Corps of Engineers' (the Corps') 1987 Corps of Engineers Wetland Delineation Manual, and the Corps' 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) was used to identify and delineate the wetlands on the site described in this report. The triple-parameter approach requires that vegetation, soils, and hydrology are each evaluated to determine the presence or absence of wetlands. An area is considered to be a wetland if each of the following is met: (a) dominant hydrophytic vegetation is present in the area, (b) the soils in the area are hydric, and (c) the necessary hydrologic conditions within the area are met.

A determination of wetland presence was made by conducting a Routine Delineation. Corresponding upland and wetland plots were recorded to characterize surface and subsurface conditions and more accurately determine the boundaries of on-site wetlands.

A.2 WETLAND VEGETATION

Hydrophytic plants are plant species specially adapted for saturated and/or anaerobic conditions. These species can be found in areas where there is a significant duration and frequency of inundation, which produces permanently or periodically saturated soils. Hydrophytic species, due to morphological, physiological, and reproductive adaptations, have the ability to grow, effectively compete, reproduce, and thrive in anaerobic soil. Indicators of hydrophytic vegetation are based on the wetland indicator status of plant species on the national wetland plant list (Lichvar and others, 2016). Plants are categorized as Obligate (OBL), Facultative Wetland (FACW), Facultative (FAC), Facultative Upland (FACU), or Upland (UPL). Species in the facultative categories (FACW, FAC, and FACU) are recognized as occurring in both wetlands and non-wetlands to varying degrees. Most wetlands are dominated mainly by species rated as OBL, FACW, or FAC (Exhibit A-1).

Exhibit A-1 Plant Indicator Status

Plant Indicator Status Categories
Obligate Wetland (OBL) – Plants that almost always occur in wetlands.
Facultative Wetland (FACW) – Plants that usually occur in wetlands but may occur in non-wetlands.
Facultative (FAC) – Plants that occur in wetlands or non-wetlands.
Facultative Upland (FACU) – Plants that usually occur in non-wetlands but may occur in wetlands.
Obligate Upland (UPL) – Plants that almost never occur in wetlands.

Source: Lichvar and others, 2016

The approximate percentage of absolute cover for each of the different plant species occurring within the tree, sapling/shrub, woody vine, and herbaceous strata was determined. Trees within a 30-foot radius, sapling/shrubs and woody vines within a 15-foot radius, and herbaceous species within a 5-foot radius of each data point were identified and noted. However, where site conditions merited it, the dimensions of the tree, sapling/shrub, woody vine, and herbaceous strata were modified.

The dominance test is the primary hydrophytic vegetation indicator and it is used in all wetland delineations. Dominant plant species are considered to be those that, when cumulatively totaled in descending order of absolute percent cover, exceed 50% of the total absolute cover for each vegetative stratum. Any additional species individually representing 20% or greater of the total absolute cover for each vegetative strata are also considered dominant. Hydrophytic vegetation is considered to be present when greater than 50% of the dominant plant species within the area had an indicator status of OBL, FACW, or FAC.

If a plant community does not meet the dominance test in areas where hydric soils and wetland hydrology are present, vegetation is reevaluated using the prevalence index, plant morphological adaptations for living in wetlands, and/or abundance of bryophytes (e.g., mosses) adapted to living in wetlands. The prevalence index is a weighted average that takes into account the abundance of all plant species within the sampling area to determine if hydrophytic vegetation is more or less prevalent. Using the prevalence index, all plants within the sampling area are grouped by wetland indicator status and absolute percent cover is summed for each group. Total cover for each indicator status group is weighted by the following multipliers: OBL=1, FACW=2, FAC=3, FACU=4, UPL=5. The prevalence index is calculated by dividing the sum of the weighted totals by the sum of total cover in the sampling area. A prevalence index of 3.0 or less indicates that hydrophytic vegetation is present.

A.3 HYDRIC SOILS

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (U.S. Department of Agriculture [USDA] Soil Conservation Service [SCS], 1994). Repeated periods of saturation and inundation for more than a few days, in combination with soil microbial activity, causes depletion in oxygen (anaerobic conditions) and results in delayed decomposition of organic matter and reduction of iron, manganese, and sulfur elements. As a result of these processes, most hydric soils develop distinctive characteristics observable in the field during both wet and dry periods (Vasilas and others, 2018). These characteristics may be exhibited as an accumulation of organic matter; bluish-gray, green-gray, or low chroma and high value soil colors; mottling or other concentrations of iron and manganese; and/or hydrogen sulfide odor similar to a rotten egg smell.

The USDA Natural Resources Conservation Service (NRCS) developed official hydric soil indicators as summarized in Field Indicators of Hydric Soils in the United States (Vasilas and others, 2018). These indicators were developed to assist in delineation of hydric soils and are based predominantly on hydric soils near the margins of wetlands. Some hydric soils, including soils within the wettest parts of wetlands, may lack any of the approved hydric soil indicators. If a hydric soil indicator is present, the soil is determined to be hydric. If no hydric soil indicator is present, additional site information is used to assess whether the soil meets the definition of hydric soil.

Identification of hydric soils was aided through observation of surface hydrologic characteristics and indicators of wetland hydrology (e.g., drainage patterns). Soil characteristics were observation at several data points, placed both inside and outside the wetland. Holes were dug with a shovel to the depth needed to document an indicator or to confirm the absence of hydric soil indicators. Soil organic content was estimated visually and texturally. Soil colors were examined in the field immediately after sampling. Dry soils were moistened. Soil colors were determined through analysis of the hue, value, and chroma best represented in the Munsell® Soil Color Chart (Munsell Color, 1992).

A.4 WETLAND HYDROLOGY

Wetland hydrology is determined by observable evidence that inundation or soil saturation have occurred during a significant portion of the growing season repeatedly over a period of years so that wet condition have been sufficient to produce wetland vegetation and hydric soils. Wetland hydrology indicators give evidence of a continuing wetland hydrologic regime. Wetland hydrology criteria were considered to be satisfied if it appeared that wetland hydrology was present for at least 5 to 12.5% (12 to 31 days) of the growing

season. The growing season in western Washington is typically considered to be from March 1 to October 31 (244 days). However, the growing season is considered to have begun when: (a) evidence of plant growth has begun on two non-evergreen vascular plants and (b) the soil reaches a temperature of 41 degrees Fahrenheit at a depth of 12 inches. The Seattle District Corps requires 14 consecutive days of inundation or saturation for wetland hydrology to be considered present.

Wetland hydrology was evaluated by direct visual observation of surface inundation or soil saturation in data plots. The area near each data point was examined for indicators of wetland hydrology. Wetland hydrology indicators are categorized as primary or secondary based on their estimated reliability. Wetland hydrology was considered present if there was evidence of one primary indicator or at least two secondary indicators.

Some primary indicators include surface water, a shallow water table or saturated soils observed within 12 inches of the surface, dried watermarks, drift lines, sediment deposits, water-stained leaves, and algal mat/crust. Some secondary indicators include a water table within 12 to 24 inches of the surface during the dry season; drainage patterns; a landscape position in a depression, drainage, or fringe of a water body; and a shallow restrictive layer capable of perching water within 12 inches of the surface.

A.5 DISCLAIMER

This methodology was prepared for reference use only and is not intended to replace Ecology's 1997 Washington State Wetlands Identification and Delineation Manual, the 1987 Corps' Wetland Delineation Manual, or the Corps' 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).

A.6 REFERENCES

Munsell Color, 1992, Munsell soil color charts: Newburgh, N.Y., Macbeth Division of Kollmorgen Instruments Corporation, 1 v.

Lichvar, R.W.; Banks, E.L.; Kirchner W.N.; and Melvin N.C., 2016, The national wetland plant list: 2016 update of wetland ratings: Phytoneuron 2016-30: 1-17. Available: http://wetland_plants.usace.army.mil/

U.S. Army Corps of Engineers (Corps) Engineer Research and Development Center, 2010, Regional supplement to the Corps of Engineers wetlands delineation manual: western mountains, valleys and coast region, Version 2.0: Vicksburg, Miss., U.S. Army Corps of Engineers Engineer Research and Development Center, Report ERDC/EL TR-10-3, 153 p.

U.S. Army Corps of Engineers (Corps) Waterways Experiment Station, 1987, Corps of Engineers wetlands delineation manual: Vicksburg, Miss., U.S. Army Corps of Engineers Waterways Experiment Station, Wetlands Research Program Technical Report Y-87-1, 143 p., available: http://www.wli.nrcs.usda.gov/delineation/.

U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS), 1994, Changes in hydric soils of the United States: Washington, D.C., Office of the Federal Register, FR 59 (133): 35680-35681, July 13.

Vasilas, L.M.; Hurt, G.W.; and Berkowitz, J.F., eds., 2018, Field indicators of hydric soils in the United States - a guide for identifying and delineating hydric soils, version 8.2, 2018: Washington, D.C., National Resources Conservation Service, 48 p., available: https://www.nrcs.usda.gov/.

Washington State Department of Ecology (Ecology), 1997, Washington state wetlands identification and delineation manual: Olympia, Wash., Washington State Department of Ecology, Report 96-94.

APPENDIX B: MAZAMA POCKET GOPHER MOUND SURVEY FORMS

Appendix B

Mazama Pocket Gopher Mound Survey Forms

2018 Thurston County Mazama Pocket Gopher Screening Field Form Site Visit Date: 6/28/19

Site Name and Parcel #	Parcel #: 09330008002 Project #: Yelm Community Park Site/Landowner: City of Olympia
How were the data collected? **(circle the method for each)**	Transect: Trimble Garmin Aerial (Incidental observations) Mounds: Trimble (Garmin) Aerial Notes: Mounds found during site visit. No transects, incidental observations.
Field Team Personnel: **(Indicate all staff present, CIRCLE who filled out form)**	Name: (Merci Clinton) Name: Amy Summe Name:
Others onsite (name/affiliation)	
Site visit # **(CIRCLE all that apply)**	(1st) 2nd Unable to screen Notes: incidental observations
Do onsite conditions preclude the need for further visits?	Yes (No) **Dense woody cover that encompasses the entire site (trees/shrubs) that appears to preclude any potential MPG use.** Impervious Compacted Graveled Flooded Other _____ Notes:
Describe visibility for mound detection:	Poor Fair (Good) Notes: Area active farmland or recently mowed.
Request mowing? **(CIRCLE and DESCRIBE WHERE MOWING IS NEEDED and SHOW ON AERIAL PHOTO**	Yes (No) N/A Notes:

Mounds observed over the whole site are characteristic of: **Quantify or describe amount of each type and approx. # of mounds** ***Group = 3 mounds or more***	**MPG Mounds**	**Likely MPG Mounds**	**Indeterminate**	**Likely Mole Mounds**	**Mole Mounds**
	5 Groups (see map)				
	No MPG mounds (circle)				
MPG mounds in GPS? **(CIRCLE and DESCRIBE)** **If MPG mounds present, entered in GPS?**	**None All Most (Some)** **Notes:** Incidental observations only, likely not all mounds onsite. **(Yes) No N/A**				
Does woody vegetation onsite match aerial photo?	**(Yes) No - describe differences and show on parcel map/aerial:**				
What portion(s) of the property was screened? **(CIRCLE and DESCRIBE)**	**All (Part) - describe and show on parcel map/aerial:** - Incidental observations during site walk. Mounds observed were documented.				
Notes -	**Describe, and show on parcel map/aerial if applicable:** See Map, Figure 2, Critical Area Report				
Team reviewed and agreed to data recorded on form? **(CIRCLE, and EXPLAIN if "No")**	**(Yes) No Reviewed by initials:** MAC AJS ____ ____ **Notes:**				

2021 Thurston County Mazama Pocket Gopher Screening Field Form **Site Visit Date:** July 29, 2021

Site Name and Parcel #	**Parcel #:** 09330005001 (Northwest Corner) **Project #:** _____ **Site/Landowner:** City of Olympia
How were the data collected? **(circle the method for each)**	**Transect:** **Trimble** **Garmin** **Aerial** Eos Arrow GNSS receiver **Mounds** **Trimble** **Garmin** **Aerial** Eos Arrow GNSS receiver **Notes:** Transects of one surveyor collected in the field. Additional transect lines of second surveyor added post survey in ArcMap using the distances used in the field.
Field Team Personnel: **(Indicate all staff present, CIRCLE who filled out form)**	**Name:** Merci Clinton **Name:** Amy Summe **Name:**
Others onsite (name/affiliation)	
Site visit # **(CIRCLE all that apply)**	**1st** **2nd** **Unable to screen** **Notes:** Mounds found on 1st survey, no additional surveys conducted.
Do onsite conditions preclude the need for further visits?	**Yes** **No** **Dense woody cover that encompasses the entire site (trees/shrubs) that appears to preclude any potential MPG use.** **Impervious** **Compacted** **Graveled** **Flooded** **Other** _____ **Notes:**
Describe visibility for mound detection:	**Poor** **Fair** **Good** **Notes:** Most of the site had been recently mowed, and the portion of the site that had not still had relatively short sparse vegetation that did not preclude identifying mounds.
Request mowing? **(CIRCLE and DESCRIBE WHERE MOWING IS NEEDED and SHOW ON AERIAL PHOTO**	**Yes** **No** **N/A** **Notes:** Site was mowed recent enough that mounds were visible during the survey.

Mounds observed over the whole site are characteristic of: **Quantify or describe amount of each type and approx. # of mounds** ***Group = 3 mounds or more***	**MPG Mounds**	**Likely MPG Mounds**	**Indeterminate**	**Likely Mole Mounds**	**Mole Mounds**
	Single mounds 2 Groups 1				
	No MPG mounds (circle)				
MPG mounds in GPS? **(CIRCLE and DESCRIBE)** **If MPG mounds present, entered in GPS?**	**None** **All** **Most** **Some** **Notes:** **Yes** **No** **N/A**				
Does woody vegetation onsite match aerial photo?	**Yes** **No - describe differences and show on parcel map/aerial:**				
What portion(s) of the property was screened? **(CIRCLE and DESCRIBE)**	**All** **Part - describe and show on parcel map/aerial:** Paved areas, areas with houses, wooded areas, and an area with fencing that we could not access were not surveyed. See map.				
Notes -	**Describe, and show on parcel map/aerial if applicable:**				
Team reviewed and agreed to data recorded on form? **(CIRCLE, and EXPLAIN if "No")**	**Yes** **No** **Reviewed by initials: _____ _____ _____ _____** **Notes:**				

Path: I:\EF\SEA\103000s\103284 Yelm Hwy Commun\GIS\MXD\MPG_Survey 2021_Parcel 1.mxd Author: BRL User: MAC Date: 8/9/2021

N

0 100

Feet

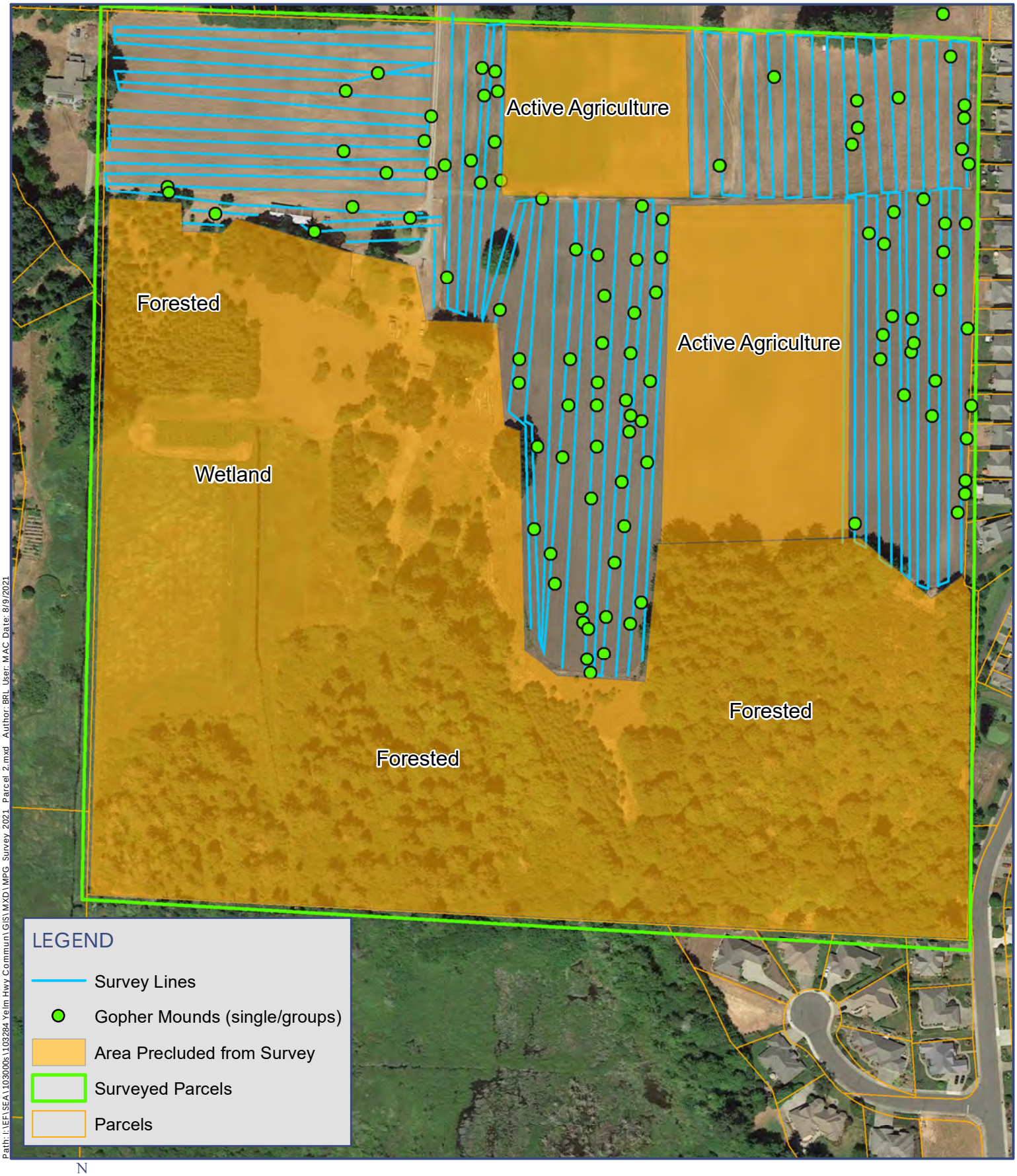
August 2021
Survey Map
Parcel 09330005001

Figure 1

2021 Thurston County Mazama Pocket Gopher Screening Field Form **Site Visit Date:** July 29, 2021

Site Name and Parcel #	**Parcel #:** 09330008002 (Southern Parcel) **Project #:** _____ **Site/Landowner:** City of Olympia
How were the data collected? **(circle the method for each)**	**Transect:** **Trimble** **Garmin** **Aerial** Eos Arrow GNSS receiver **Mounds** **Trimble** **Garmin** **Aerial** Eos Arrow GNSS receiver **Notes:** Transects of one surveyor collected in the field. Additional transect lines of second surveyor and added post survey in ArcMap using the distances used in the field.
Field Team Personnel: **(Indicate all staff present, CIRCLE who filled out form)**	**Name:** Merci Clinton **Name:** Amy Summe **Name:**
Others onsite (name/affiliation)	
Site visit # **(CIRCLE all that apply)**	**1st** **2nd** **Unable to screen** **Notes:** Mounds found on 1st survey, no additional surveys conducted.
Do onsite conditions preclude the need for further visits?	**Yes** **No** **Dense woody cover that encompasses the entire site (trees/shrubs) that appears to preclude any potential MPG use.** **Impervious** **Compacted** **Graveled** **Flooded** **Other** _____ **Notes:**
Describe visibility for mound detection:	**Poor** **Fair** **Good** **Notes:** Most of the site had been recently mowed, and the portion of the site that had not still had relatively short sparse vegetation that did not preclude identifying mounds.
Request mowing? **(CIRCLE and DESCRIBE WHERE MOWING IS NEEDED and SHOW ON AERIAL PHOTO**	**Yes** **No** **N/A** **Notes:** Site was mowed recent enough that mounds were visible during the survey.

Mounds observed over the whole site are characteristic of: **Quantify or describe amount of each type and approx. # of mounds** ***Group = 3 mounds or more***	**MPG Mounds**	**Likely MPG Mounds**	**Indeterminate**	**Likely Mole Mounds**	**Mole Mounds**
	Single mounds 3 Groups 113	2		3	
	No MPG mounds (circle)				
MPG mounds in GPS? **(CIRCLE and DESCRIBE)** **If MPG mounds present, entered in GPS?**	**None** **All** **Most** **Some** **Notes:** **Yes** **No** **N/A**				
Does woody vegetation onsite match aerial photo?	**Yes** **No - describe differences and show on parcel map/aerial:**				
What portion(s) of the property was screened? **(CIRCLE and DESCRIBE)**	**All** **Part - describe and show on parcel map/aerial:** Areas with active agriculture, areas with houses, wooded areas, and wetland areas not surveyed. See map.				
Notes -	**Describe, and show on parcel map/aerial if applicable:** Groups points have anywhere from 5-100 mounds associated with them. Much of the site that is not currently being actively used has high densities of new and old gopher mounds (likely several thousand indivdual mounds across the parcel.				
Team reviewed and agreed to data recorded on form? **(CIRCLE, and EXPLAIN if "No")**	**Yes** **No** **Reviewed by initials: _____ _____ _____ _____** **Notes:**				



Path: I:\EF\SEA\103000s\103284 Yelm Hwy Commun\GIS\MXD\MPG_Survey 2021_Parcel_2.mxd Author: BRL User: MAC Date: 8/9/2021

N

0 250
Feet

August 2021

Survey Map
Parcel 09330008002

Figure 1

APPENDIX C: WETLAND DATA FORMS

Appendix C

Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Yelm Community Park City/County: Thurston County Sampling Date: 6/25/19
Applicant/Owner: City of Olympia State: WA Sampling Point: DP-1
Investigator(s): Amy Summe, Merci Clinton Section, Township, Range: S40 T17N R1W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 1
Subregion (LRR): A Lat: 46.994296 Long: -122.851452 Datum: WGS84
Soil Map Unit Name: 70-Mukilteo muck, drained NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	x
Wetland Hydrology Present?	Yes		No	x

Is the Sampled Area within a Wetland? Yes ___ No x

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	75	Yes	FACU
2. Populus balsamifera	30	Yes	FAC
3.			
4.			
	105	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 3 ft)			
1. Ranunculus repens	100	Yes	FAC
2. Holcus lanatus	15	No	FAC
3. Phalaris arundinacea	70	Yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	185	= Total Cover	

Woody Vine Stratum (Plot size: 3 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: DP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5yr 2.5/1	100					Sil/Loam	Soil very dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Yelm Community Park City/County: Thurston County Sampling Date: 6/25/19
Applicant/Owner: City of Olympia State: WA Sampling Point: DP-2
Investigator(s): Amy Summe, Merci Clinton Section, Township, Range: S40 T17N R1W
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 1
Subregion (LRR): A Lat: 46.994296 Long: -122.851452 Datum: WGS84
Soil Map Unit Name: 70-Mukilteo muck, drained NWI classification: PSSC
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a Wetland? Yes X No ___

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15 ft)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 3 ft)			
1. Ranunculus repens	30	No	FAC
2. Holcus lanatus	80	Yes	FAC
3. Phalaris arundinacea	5	No	FACW
4. Lotus corniculatus	40	Yes	FAC
5. Juncus ensifolius	10	No	FACW
6. Juncus effusus	20	No	FACW
7. Other grasses	5	No	FAC
8.			
9.			
10.			
11.			
	190	= Total Cover	

Woody Vine Stratum (Plot size: 3 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
x 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: DP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR2.5/1	95	5YR5/6	5	C	M	Silt/loam	
12-20	7.5YR2.5/1	90	5YR5/6	10	C	M	Silt/loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** x **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 17

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 8

Wetland Hydrology Present? **Yes** ___ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Beaver activity documented on the site.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Yelm Community Park City/County: Thurston County Sampling Date: 6/25/19
Applicant/Owner: City of Olympia State: WA Sampling Point: DP-3
Investigator(s): Amy Summe, Merci Clinton Section, Township, Range: S40 T17N R1W
Landform (hillslope, terrace, etc.): Stream Bank Local relief (concave, convex, none): None Slope (%): 1
Subregion (LRR): A Lat: 46.994303 Long: -122.852004 Datum: WGS84
Soil Map Unit Name: 70-Mukilteo muck, drained NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes		No	X
Wetland Hydrology Present?	Yes		No	X

Is the Sampled Area within a Wetland? **Yes** ___ **No** x

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus balsamifera	75	yes	FAC
2.			
3.			
4.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Oemleria cerasiformis	75	Yes	FACU
2. Sambucus racemosa	5	No	FACU
3. Spiraea douglasii	15	No	FACW
4. Rubus armeniacus	5	No	FAC
5.			
	110	= Total Cover	
Herb Stratum (Plot size: 3 ft)			
1. Ranunculus repens	70	Yes	FAC
2. Urtica dioica	60	No	FAC
3. Phalaris arundinacea	70	Yes	FACW
4. Tellima grandiflora	trace	No	FACU
5. Geranium robertianum	50	No	FACU
6. Galium aparine	40	No	FACU
7. Carex deweyana	40	No	FAC
8.			
9.			
10.			
11.			
	330	= Total Cover	
Woody Vine Stratum (Plot size: 3 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- x 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	7.5YR2.5/1	100					Silt/loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Yelm Community Park | City/County: Thurston County | Sampling Date: 6/25/19
Applicant/Owner: City of Olympia | State: WA | Sampling Point: DP-4
Investigator(s): Amy Summe, Merci Clinton | Section, Township, Range: S40 T17N R1W
Landform (hillslope, terrace, etc.): Stream Bank | Local relief (concave, convex, none): None | Slope (%): 1
Subregion (LRR): A | Lat: 46.994303 | Long: -122.852004 | Datum: WGS84
Soil Map Unit Name: 70-Mukilteo muck, drained | NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ___ (If no, explain in Remarks.)
Are Vegetation ___ , Soil ___ , or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x No ___
Are Vegetation ___ , Soil ___ , or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	___	No	X
Hydric Soil Present?	Yes	___	No	X
Wetland Hydrology Present?	Yes	___	No	X

Is the Sampled Area within a Wetland? Yes ___ No x

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	65	yes	FACU
2.			
3.			
4.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 ft)			
1. Rubus armeniacus	5	Yes	FAC
2. Sambucus racemosa	5	Yes	FACU
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 3 ft)			
1. Galium aparine	50	Yes	FACU
2. Phalaris arundinacea	40	Yes	FACW
3. Agrostis capillaris	25	Yes	FAC
4. Vicia sp.	5	No	FACU
5. Lolium perenne	20	No	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	117	= Total Cover	
Woody Vine Stratum (Plot size: 3 ft)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	50	x 3 =	150
FACU species	125	x 4 =	500
UPL species	0	x 5 =	0
Column Totals:	215 (A)		730 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point: DP-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	7.5YR2.5/1	99	10YR4/6	1	C	M	Silt/loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX D: SITE PHOTOGRAPHS

Appendix D

Site Photographs

APPENDIX D: SITE PHOTOGRAPHS

Exhibit D-1: View of Wetland A from the North. Wetland Continues Beyond the Forest in the Background.

APPENDIX D: SITE PHOTOGRAPHS

Exhibit D-2: Example of Forested Area of Wetlands. Photo Taken Along Eastern Edge of Wetland A.

APPENDIX D: SITE PHOTOGRAPHS

Exhibit D-3: Example of Forested Uplands Around Wetland A. Photo Taken to the East of Wetland A.

APPENDIX D: SITE PHOTOGRAPHS

Exhibit D-4: Tilled Agricultural Fields in the Study Area

Exhibit D-5: Planted Forested Upland Area, North of Wetland A

APPENDIX D: SITE PHOTOGRAPHS

Exhibit D-6: Mazama Pocket Gopher Mound Documented on Parcel 09330008002

APPENDIX D: SITE PHOTOGRAPHS

Exhibit D-7: Image of One of the Oregon White Oak Stands Located in the Study Area

APPENDIX E: WETLAND RATING FORMS

Appendix E

Wetland Rating Forms

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 25-Jun-19

Rated by Merci Clinton Trained by Ecology? ☑ Yes ☐ No Date of training 10/30/2018

HGM Class used for rating Depressional & Flats Wetland has multiple HGM classes? ☐ Yes ☑ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).
Source of base aerial photo/map Esri

OVERALL WETLAND CATEGORY II (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

X **Category I** - Total score = 23 - 27
_ **Category II** - Total score = 20 - 22
_ **Category III** - Total score = 16 - 19
_ **Category IV** - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential	H	M	H	
Landscape Potential	H	M	L	
Value	H	H	H	**Total**
Score Based on Ratings	9	7	7	**23**

Score for each function based on three ratings (*order of ratings is not important*)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	Category
Estuarine	
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	**X**

Wetland name or number A

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	2
Map of the contributing basin	D 4.3, D 5.3	3
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	6

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetland in Western Washington

For questions 1 -7, the criteria described must apply to the entire unit being rated.
If hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1 - 7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

☑ NO - go to 2 ☐ **YES** - the wetland class is **Tidal Fringe** - go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ **NO - Saltwater Tidal Fringe (Estuarine)** ☐ **YES - Freshwater Tidal Fringe**
*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it.
Groundwater and surface water runoff are NOT sources of water to the unit.

☑ NO - go to 3 ☐ **YES** - The wetland class is **Flats**
*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
- ☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

☑ NO - go to 4 ☐ **YES** - The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The wetland is on a slope (*slope can be very gradual*),
- ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
- ☐ The water leaves the wetland **without being impounded.**

☑ NO - go to 5 ☐ **YES** - The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
- ☐ The overbank flooding occurs at least once every 2 years.

☑ NO - go to 6 ☐ **YES** - The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding.

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☐ NO - go to 7 ☑ **YES** - The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐ NO - go to 8 ☐ **YES** - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

NOTES and FIELD OBSERVATIONS:
NRCS (Mukilteo muck, drained)

Wetland name or number A

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. ☑ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 3 points = 2 points = 1 points = 1	1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*).	Yes = 4 No = 0	4
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area Wetland has persistent, ungrazed, plants > ½ of area Wetland has persistent, ungrazed plants > $^1/_{10}$ of area Wetland has persistent, ungrazed plants < $^1/_{10}$ of area	points = 5 points = 3 points = 1 points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland Area seasonally ponded is > ¼ total area of wetland Area seasonally ponded is < ¼ total area of wetland	points = 4 points = 2 points = 0	4
Total for D 1	Add the points in the boxes above	**14**

Rating of Site Potential If score is: ☑ **12 - 16 = H** ☐ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 - D 2.3? Source nitrate in groundwater	Yes = 1 No = 0	1
Total for D 2	Add the points in the boxes above	**3**

Rating of Landscape Potential If score is: ☑ **3 or 4 = H** ☐ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)?	Yes = 2 No = 0	2
Total for D 3	Add the points in the boxes above	**3**

Rating of Value If score is: ☑ **2 - 4 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number A

DEPRESSIONAL AND FLATS WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	0
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☑ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire wetland is in the Flats class points = 5	3
Total for D 4 — Add the points in the boxes above	**6**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic function of the site?	
D 5.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1
Total for D 5 — Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: ☐ **3 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): ● Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 ☑ ● Surface flooding problems are in a sub-basin farther down-gradient. points = 1 ☐ Flooding from groundwater is an issue in the sub-basin. points = 1 ☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why points = 0 ☐ There are no problems with flooding downstream of the wetland. points = 0	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0

Total for D 6	Add the points in the boxes above	2

Rating of Value If score is: ☑ **2 - 4 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

Wetland name or number A

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- ☐ Aquatic bed
- ☑ Emergent
- ☑ Scrub-shrub (areas where shrubs have > 30% cover)
- ☑ Forested (areas where trees have > 30% cover)

4 structures or more: points = 4
3 structures: points = 2
2 structures: points - 1
1 structure: points = 0

If the unit has a Forested class, check if:

- ☑ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

4

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

- ☐ Permanently flooded or inundated
- ☑ Seasonally flooded or inundated
- ☑ Occasionally flooded or inundated
- ☑ Saturated only

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 types present: points = 0

- ☑ Permanently flowing stream or river in, or adjacent to, the wetland
- ☑ Seasonally flowing stream in, or adjacent to, the wetland
- ☐ **Lake Fringe wetland** **2 points**
- ☐ **Freshwater tidal wetland** **2 points**

3

H 1.3. Richness of plant species

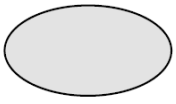
Count the number of plant species in the wetland that cover at least 10 ft^2.
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted:
- > 19 species — points = 2
- 5 - 19 species — points = 1
- < 5 species — points = 0

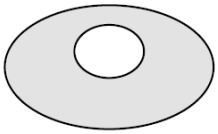
2

H 1.4. Interspersion of habitats

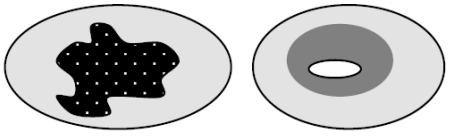
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



None = 0 points

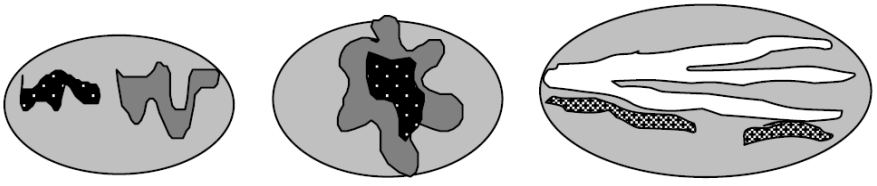


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3 points



3

Wetland name or number A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☑ Standing snags (dbh > 4 in) within the wetland ☑ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☑ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☑ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	5
Total for H 1 Add the points in the boxes above	**17**

Rating of Site Potential If Score is: ☑ **15 - 18 = H** ☐ **7 - 14 = M** ☐ **0 - 6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 0 % undisturbed habitat + (14 % moderate & low intensity land uses / 2) = 7% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* 0 % undisturbed habitat + (24 % moderate & low intensity land uses / 2) = 12% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	2
H 2.3 Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (-2) ≤ 50% of 1km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	**0**

Rating of Landscape Potential If Score is: ☐ **4 - 6 = H** ☐ **1 - 3 = M** ☑ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated* . Site meets ANY of the following criteria: points = 2 ☑ It has 3 or more priority habitats within 100 m (see next page) ☑ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☑ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) with in 100m points = 1 Site does not meet any of the criteria above points = 0	2

Wetland name or number A

Rating of Value If Score is: ☑ **2 = H** ☐ **1 = M** ☐ **0 = L** *Record the rating on the first page*

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE**: This question is independent of the land use between the wetland unit and the priority habitat.*

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☐ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☑ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☑ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes - Go to **SC 2.2** ☑ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☑ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☑ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☑ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes - Go to **SC 3.3** ☑ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☑ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed	

in Table 4 provide more than 30% of the cover under the canopy?

☐ Yes = **Is a Category I bog** ☑ No = **Is not a bog**

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

☐ Yes = **Category I** ☑ No = **Not a forested wetland for this section**

SC 5.0. Wetlands in Coastal Lagoons

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

☐ Yes - Go to **SC 5.1** ☑ No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

☐ Yes = **Category I** ☐ No = **Category II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

☐ Yes - Go to **SC 6.1** ☑ No = **Not an interdunal wetland for rating**

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

☐ Yes = **Category I** ☐ No - Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

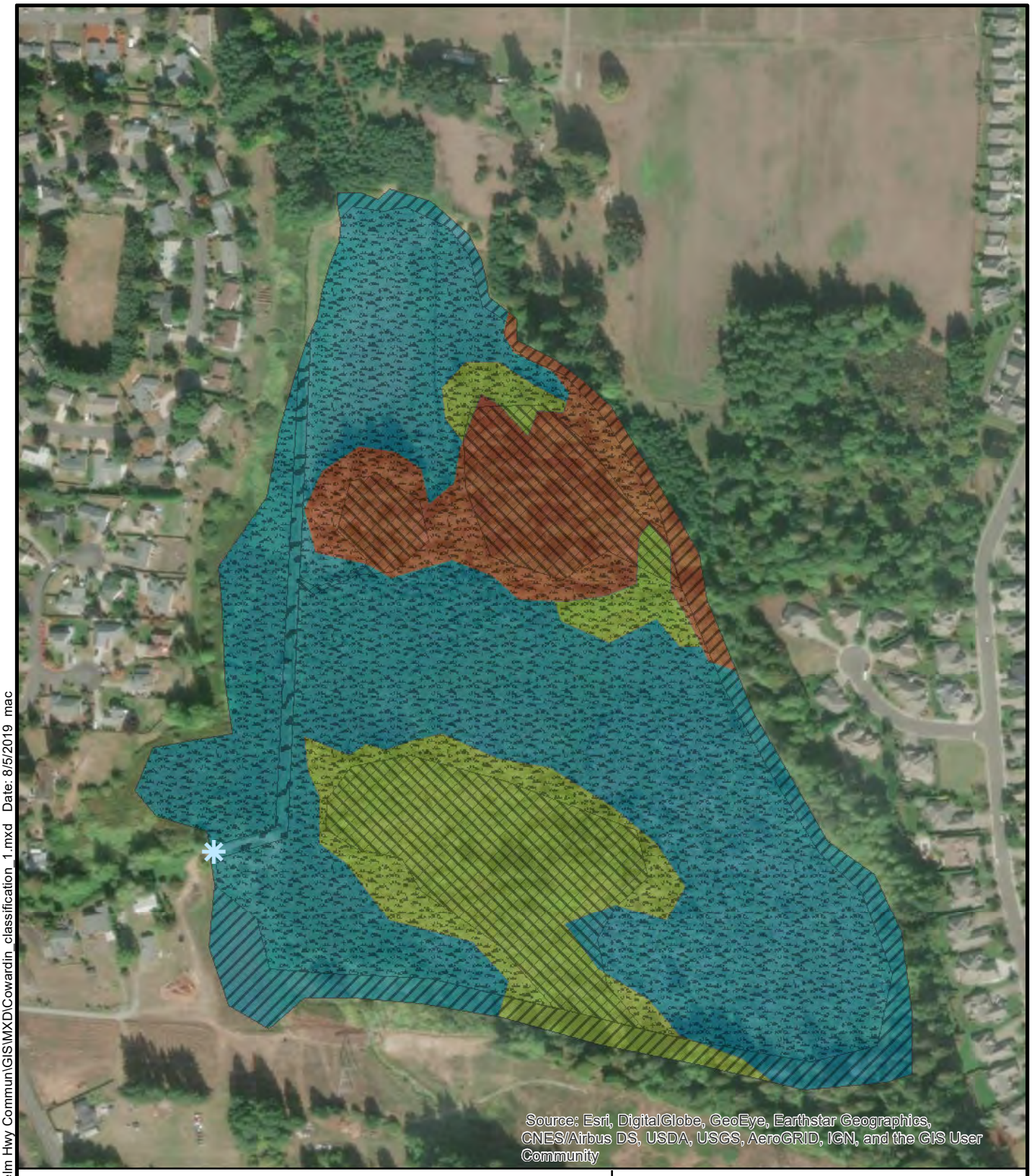
☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

☐ Yes = **Category III** ☐ No = **Category IV**

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form



Legend

- Emergent
- Forested
- Scrub-shrub
- Outlet
- Occasionally inundated
- Permanently inundated
- Saturated
- Seasonally flowing stream

N W E S

0 125 250 500 Feet

Yelm Community Park Master Plan
Olympia Washington

COWARDIN CLASSES AND HYDROPERIODS

August 2019 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 1

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Commun\GIS\MXD\Cowardin_classification_1.mxd Date: 8/5/2019 mac

Legend

- Wetland A
- 150 Foot Buffer
- Pollutant Generating Surface

N
W E
S

0 125 250 500 Feet

Yelm Community Park Master Plan
Olympia Washington

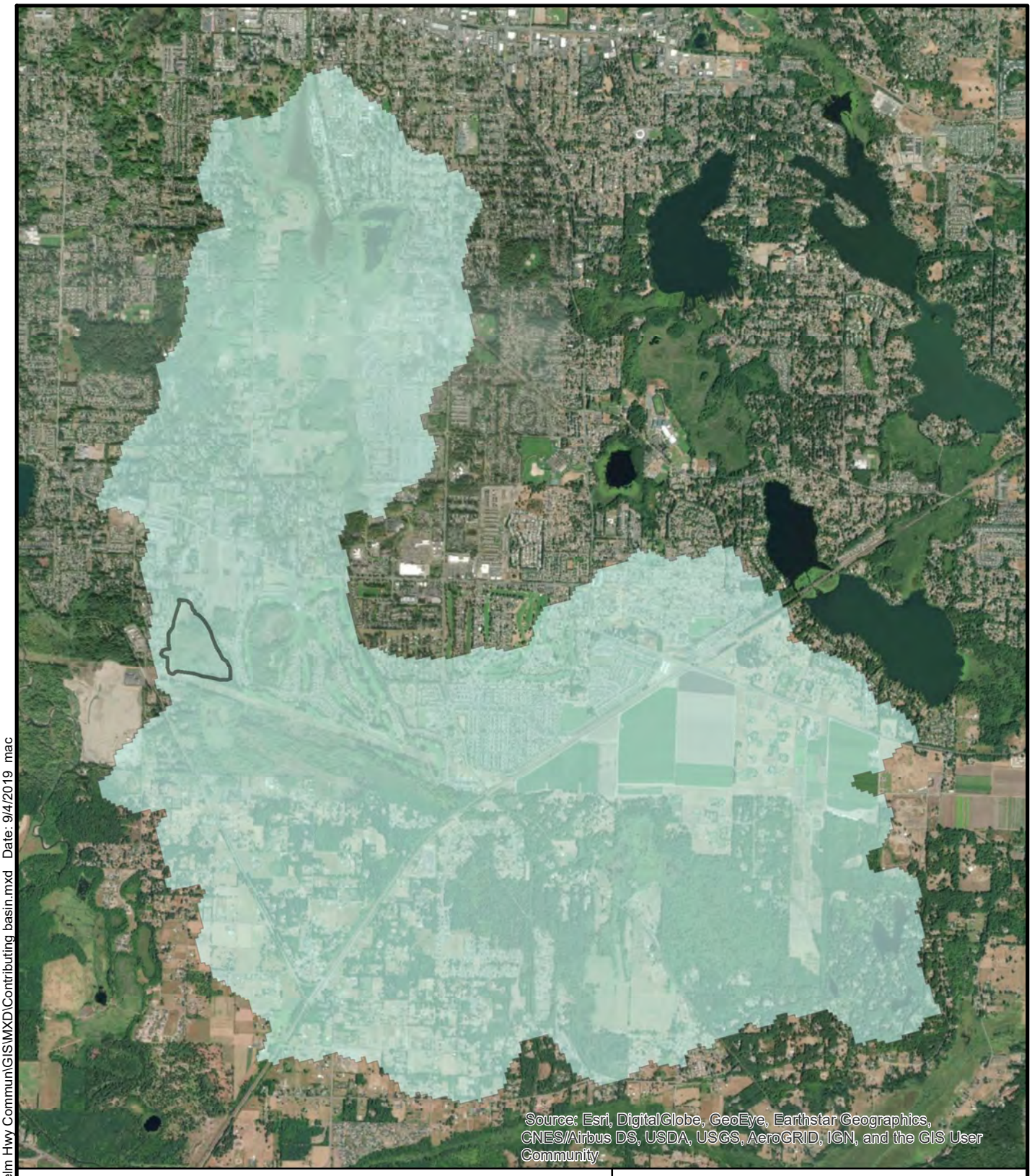
150 FOOT BOUNDARY

August 2019 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 2

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Commun\GIS\MXD\150 foot buffer.mxd Date: 8/5/2019 mac



Legend

- Wetland A
- Contributing Basin

N
W E
S

0 0.25 0.5 1 Miles

Yelm Community Park Master Plan
Olympia Washington

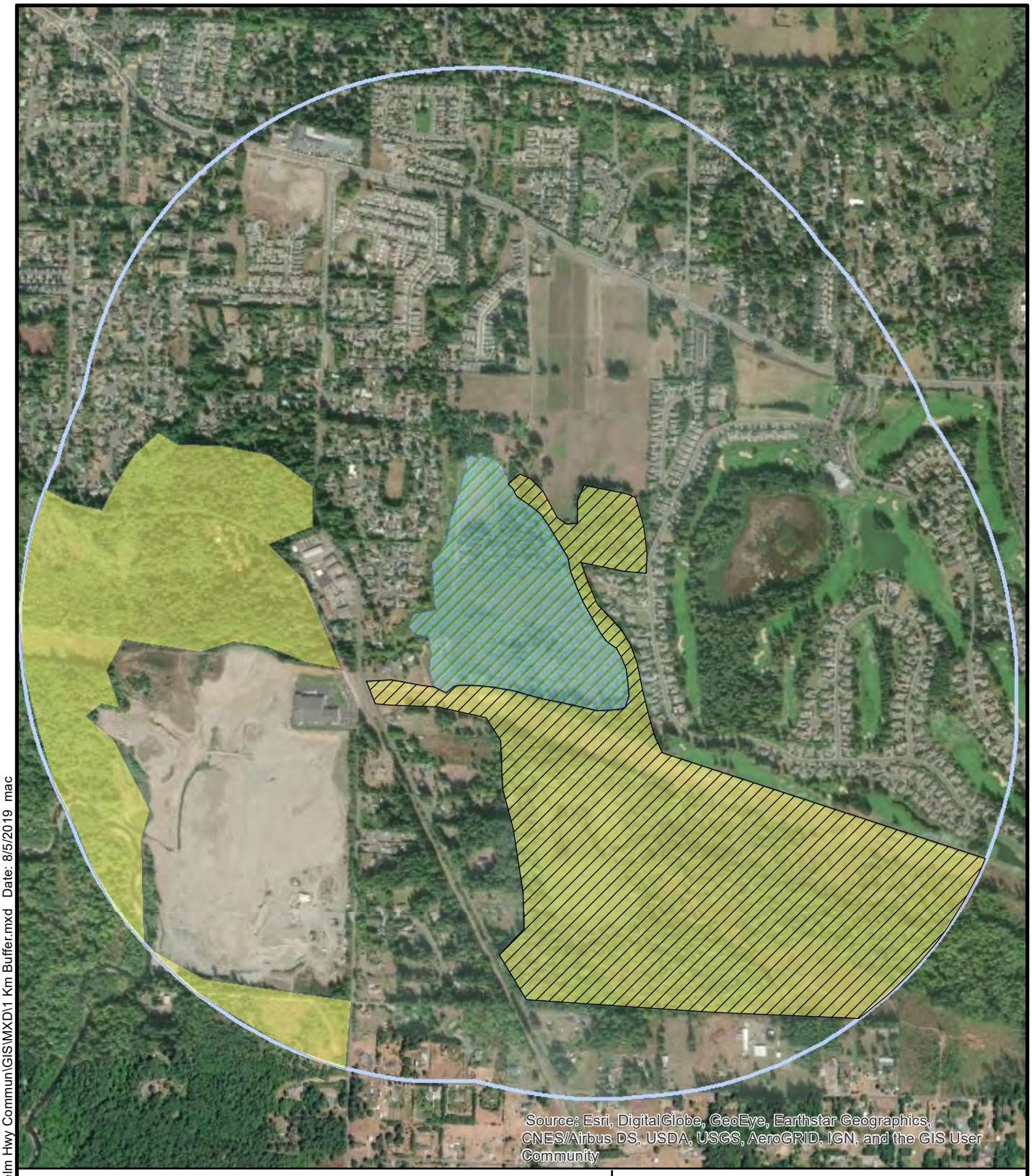
MAP OF THE CONTRIBUTING BASIN

August 2019 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 3

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Comm\GIS\MXD\Contributing basin.mxd Date: 9/4/2019 mac



Legend

- Wetland A
- 1 Kilometer Buffer
- Moderate & Low Intensity Land Use
- Accessible Habitat

N
W E
S

Yelm Community Park Master Plan
Olympia Washington

1 KILOMETER POLYGON

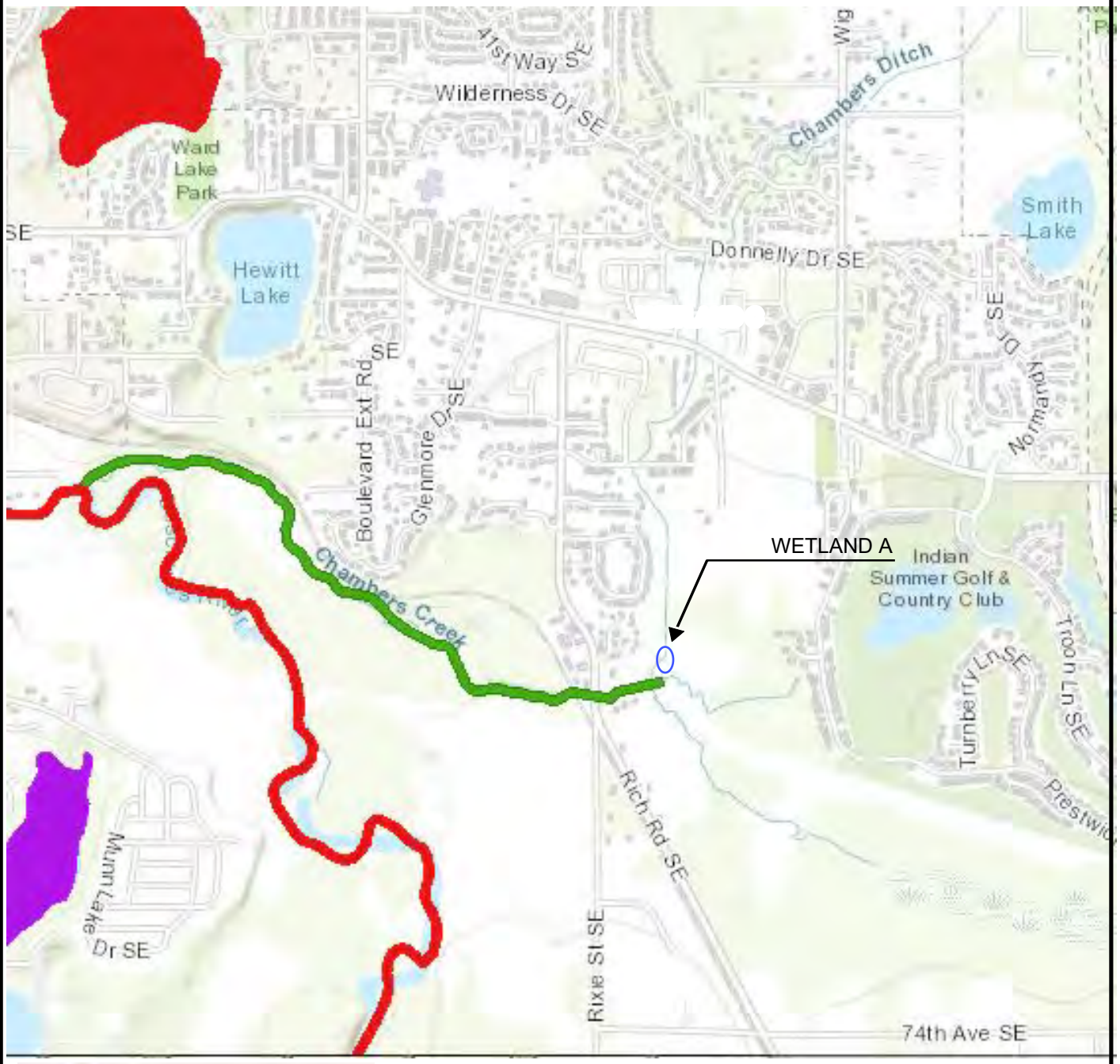
August 2019 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 4

Filename: I:\EF\SEA\103000s\103284 Yelm Hwy Commun\GIS\MXD\1 Km Buffer.mxd Date: 8/5/2019 mac

Document Path: I:\EF\SEA\102000s\102336 Port of Everett\Baywood\GIS\MXD\Rating_fig_5.mxd



Water

- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

N W E S

Yelm Community Park Master Plan
Olympia Washington

WETLAND A
303(D) LISTED WATERS

August 2019 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 5

Filename: I:\EF\SEA\102000s\102336 Port of Everett\Baywood\GIS\MXD\Rating_fig_5.mxd Date: 2/11/2019 MAC

DEPARTMENT OF ECOLOGY State of Washington

Thurston County

Water quality improvement projects

Select the waterbody or pollutant name to find more information about the specific project.

Waterbody Name(s)	Pollutant(s)	Status	Project Lead(s)
Deschutes River	Temperature	EPA Approved and Has an implementation plan	Andrew Kolosseus 360-407-7543
Deschutes River	Dissolved Oxygen pH Sediment Fecal Coliform	Pending	Andrew Kolosseus 360-407-7543
Budd Inlet	Dissolved Oxygen	Under development	Leanne Weiss 360-407-0243
Upper Chehalis River Watershed	Ammonia-N BOD (5-day) Dissolved Oxygen Fecal Coliform Temperature	EPA Approved	Devan Rostorfer 360-690-4665
Henderson Inlet Watershed	Multi-parameter	EPA approved and Has an implementation plan	Donovan Gray 360-407-6407
Nisqually Watershed	Dissolved Oxygen Fecal Coliform	EPA approved and Has an implementation plan	Donovan Gray 360-407-6407
Totten/Eld Inlets Tributaries	Fecal Coliform Temperature	EPA approved Has an implementation plan	Andrew Kolosseus 360-407-7543

To request ADA accommodation, call Ecology at 360-407-7668, 711 (relay service), or 877-833-6341 (TTY). More about our accessibility services.

Yelm Community Park Master Plan
Olympia Washington

WETLAND A
LISTED TMDL'S SCREENSHOT

August 2019 103284-002

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

FIG. 6

IMPORTANT INFORMATION

Important Information

About Your Wetland Delineation/Mitigation and/or Stream Classification Report

IMPORTANT INFORMATION

A WETLAND/STREAM REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

Wetland delineation/mitigation and stream classification reports are based on a unique set of project-specific factors. These typically include the general nature of the project and property involved, its size and configuration, historical use and practice, the location of the project on the site and its orientation, and the level of additional risk the client assumed by virtue of limitations imposed upon the exploratory program. The jurisdiction of any particular wetland/stream is determined by the regulatory authority(ies) issuing the permit(s). As a result, one or more agencies will have jurisdiction over a particular wetland or stream with sometimes confusing regulations. It is necessary to involve a consultant who understands which agency(ies) has jurisdiction over a particular wetland/stream and what the agency(ies) permitting requirements are for that wetland/stream. To help reduce or avoid potential costly problems, have the consultant determine how any factors or regulations (which can change subsequent to the report) may affect the recommendations.

Unless your consultant indicates otherwise, your report should not be used:

- If the size or configuration of the proposed project is altered.
- If the location or orientation of the proposed project is modified.
- If there is a change of ownership.
- For application to an adjacent site.
- For construction at an adjacent site or on site.
- Following floods, earthquakes, or other acts of nature.

Wetland/stream consultants cannot accept responsibility for problems that may develop if they are not consulted after factors considered in their reports have changed. Therefore, it is incumbent upon you to notify your consultant of any factors that may have changed prior to submission of our final report.

Wetland boundaries identified and stream classifications made by Shannon & Wilson are considered preliminary until validated by the U.S. Army Corps of Engineers (Corps) and/or the local jurisdictional agency. Validation by the regulating agency(ies) provides a certification, usually written, that the wetland boundaries verified are the boundaries that will be regulated by the agency(ies) until a specified date, or until the regulations are modified, and that the stream has been properly classified. Only the regulating agency(ies) can provide this certification.

MOST WETLAND/STREAM "FINDINGS" ARE PROFESSIONAL ESTIMATES.

Site exploration identifies wetland/stream conditions at only those points where samples are taken and when they are taken, but the physical means of obtaining data preclude the determination of precise conditions. Consequently, the information obtained is intended to be sufficiently accurate for design but is subject to interpretation. Additionally, data derived through sampling and subsequent laboratory testing are extrapolated by the consultant who then renders an opinion about overall conditions, the likely reaction to proposed construction activity, and/or appropriate design. Even under optimal circumstances, actual conditions may differ from those thought to exist because no consultant, no matter how qualified, and no exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock, and time. Nothing can be done to prevent the unanticipated, but steps can be taken to help reduce their impacts. For this reason, most experienced owners retain

IMPORTANT INFORMATION

their consultants through the construction or wetland mitigation/stream classification stage to identify variances, conduct additional evaluations that may be needed, and recommend solutions to problems encountered on site.

WETLAND/STREAM CONDITIONS CAN CHANGE.

Since natural systems are dynamic systems affected by both natural processes and human activities, changes in wetland boundaries and stream conditions may be expected. Therefore, delineated wetland boundaries and stream classifications cannot remain valid for an indefinite period of time. The Corps typically recognizes the validity of wetland delineations for a period of five years after completion. Some city and county agencies recognize the validity of wetland delineations for a period of two years. If a period of years has passed since the wetland/stream report was completed, the owner is advised to have the consultant reexamine the wetland/stream to determine if the classification is still accurate.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or water fluctuations may also affect conditions and, thus, the continuing adequacy of the wetland/stream report. The consultant should be kept apprised of any such events and consulted to determine if additional evaluation is necessary.

THE WETLAND/STREAM REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when plans are developed based on misinterpretation of a wetland/stream report. To help avoid these problems, the consultant should be retained to work with other appropriate professionals to explain relevant wetland, stream, geological, and other findings, and to review the adequacy of plans and specifications relative to these issues.

DATA FORMS SHOULD NOT BE SEPARATED FROM THE REPORT.

Final data forms are developed by the consultant based on interpretation of field sheets (assembled by site personnel) and laboratory evaluation of field samples. Only final data forms are customarily included in a report. These data forms should not, under any circumstances, be drawn for inclusion in other drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to reduce the possibility of misinterpreting the forms. When this occurs, delays, disputes, and unanticipated costs are frequently the result.

To reduce the likelihood of data from misinterpretation, contractors, engineers, and planners should be given ready access to the complete report. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of information always insulates them from attendant liability. Providing the best available information to contractors, engineers, and planners helps prevent costly problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because a wetland delineation/stream classification is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in written transmittals. These are not exculpatory clauses designed to foist the consultant's liabilities onto someone else; rather, they are definitive clauses that identify where

IMPORTANT INFORMATION

the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

THERE MAY BE OTHER STEPS YOU CAN TAKE TO REDUCE RISK.

Your consultant will be pleased to discuss other techniques or designs that can be employed to mitigate the risk of delays and to provide a variety of alternatives that may be beneficial to your project.

Contact your consultant for further information.

D. Pocket Gopher Considerations for Secondary School Memorandum

SHANNON & WILSON

MEMORANDUM

TO: Andy Mitton, Berger Partnership

FROM: Merci Clinton, PWS

DATE: October 1, 2021

PROJECT: Yelm Highway Community Park Master Plan

PROJ. #: 103284-017

SUBJECT: Pocket Gopher Considerations for Secondary School Project

The following memo outlines some of the procedures and considerations around the acquisition of mitigation for impacts to Endangered Species Act-listed Mazama pocket gopher (MPG) associated with the Yelm Community Park Project being developed by the City of Olympia Parks, Art, and Recreation Department (OPARD) and the Secondary School Project being developed by the Olympia School District (OSD). The information was obtained through the review of the Draft Thurston County Habitat Conservation Plan (HCP); review of the Thurston County HCP resource page; and a meeting on September 28, 2021, with Christina Chaput, the lead planner working on the County HCP. The information provided is based on our current understanding of the projects and the County HCP permitting process.

REQUIREMENTS FOR COVERAGE UNDER HABITAT CONSERVATION PLAN

Based on our conversation with Ms. Chaput, it is our understanding that coverage under the County HCP is tied to the submittal and approval of county permits (e.g., building permit, grading permit, etc.). This requires that the applicant has developed site plans that are complete enough to go through the County's permitting process that would then allow them to acquire a Certificate of Inclusion to the County's Incidental Take Permit. Since coverage under the County HCP is tied to the County's permit process and mitigation is tied to specific impacts associated with the development being permitted, OPARD could only acquire mitigation for impacts associated with the development of the school if OPARD and not the OSD was the applicant for the school project. Coverage under the HCP and therefore the acquisition of mitigation for impacts would occur as each phase of the overall park/school project is permitted. Therefore, cost-sharing would not be necessary since the park and the school would both be permitted and paid for separately. That being said, there are several things to consider when it comes to mitigation costs.

The cost of mitigation is tied to the cost of land in Thurston County, which is projected to steadily go up. From a mitigation cost standpoint, the sooner a project can get through the permitting process and get coverage under either the County HCP or an Individual HCP, the better. Expediting the development plans for the school and the park may reduce costs for both projects in the long run.

Another aspect to consider is that the County HCP's covered activities include actions and projects for which the County issues permits or approvals. If the site is annexed by the City of Olympia before the acquisition of permits, there are a couple of routes that may be taken. The project could proceed with permitting under the jurisdiction of the City of Olympia and develop an Individual HCP, or the City could pursue an interlocal agreement with the county, which would allow for Thurston County to continue as the permitting authority for the development of the site that would keep the development under the umbrella of the County HCP. The regional U.S Fish and Wildlife Service office has indicated that the processing of Individual HCPs is not their priority and going that route might take considerable time. It is recommended that the interlocal agreement be considered to cut down on both the time and overall costs for both the school and park projects.

However, more information about the interlocal agreement process needs to be gathered to determine the feasibility and terms of an agreement. It may be that the park project, which will be starting its permit process under the County, could continue with County permitting under an interlocal agreement, but the County might not entertain an interlocal agreement for a project that has not started the permitting process prior to the annexation. We may have more information about this in the next few months as the City starts discussions with the County staff about a potential agreement and as the HCP-implementing code is developed by the County.

In summary:

- Coverage under the Thurston County HCP through a Certificate of Inclusion to the county's Incidental Take Permit is directly connected to the County's permit process, so each component that is permitted will be covered separately under the HCP and will need to acquire mitigation separately.
- Coverage under the Thurston County HCP is only for actions where Thurston County is the permitting authority. If annexation occurs before the acquisition of permits for any phase of the project, an interlocal agreement would need to be secured or an Individual HCP would need to be developed.
- The development and agency approval process for an Individual HCP could add considerable time and cost to the permitting process.

- The cost of mitigation is tied to the cost of land in Thurston County, so any way that a development plan could be expedited and get through the county permitting process could lead to cost reduction in the long run.

MITIGATION COST BREAKDOWN

Thurston County has created a mitigation fee calculator (see enclosure) to help determine the approximate cost of mitigation for project impacts. The costs are based on several factors, including habitat value, subspecies of MPG on the site, and cost per credit. The entire site, including the estimated 35 acres of MPG habitat slated for the parks project and the 20 acres slated for the school project, has the following values.

- Habitat Value for more preferred soils on the site = 1.6.
- Subspecies of MPG on-site = Yelm Pocket Gopher North.
- Estimated cost per credit for Yelm Pocket Gopher North = $20,215.

The calculation for determining the total estimated cost for mitigation is:

= (project area x habitat value) x cost per credit

Assuming a worst-case scenario that the park and the school impact 100% of the mapped gopher habitat on the site, the total estimated cost for mitigation would be $1,132,040 for the 35 acres of impacts from the development of the park and $646,880 for the 20 acres of impacts from the development of the school. It should be noted that this is an estimate based on current land values in Thurston County. As the cost of land increases, the cost of mitigation will also go up.

REFERENCES

Thurston County Community Planning and Economic Development Department, 2020, Draft Thurston County Habitat Conservation Plan, July 23, p. 168.

MAC:AJS:PCJ/mac

Enc. HCP Form: Estimate Gopher Mitigation Fee

HCP FORM: ESTIMATE GOPHER MITIGATION FEE

Instructions on back. Details at thurstonHCP.org, see **Builders & Permit Applicants**.
If you have a printed form, check for the latest version online.

BEFORE YOU BEGIN Ask if your project is covered by the HCP	• Yes. (Continue worksheet) • No. _____ • Other. _____
BEFORE YOU BEGIN Use HCP BMPs Avoid/Reduce Impacts	• Yes, I used HCP Best Management Practices (BMPs). • No/Unsure. (BMPs are required. Design changes may be requested.)
Step 1 Add Total Project Area	This is the **total** project area. Include grading, filling & all land disturbance. • _____ acres (Conversion rate: 43,560 sq. feet = 1 acre).
Step 2 Look up Which Habitat is Mapped on Property	Circle gopher species, soils & category. Species YPG N YPG E YPG S OPG TPG Soils More Preferred Less Preferred Category 1-Occupied | 2-Close | 3- Not close + std veg quality
Step 4 Calculate Estimated Mitigation Fee	A→ From Step 1 (Project Area) x From Step 3 (Habitat Value) = (Credits Needed) B→ From Step 3 (Cost per Credit) x Answer from Step 4A (Credits Needed) = (Mitigation Fee Estimate)

Table 1: Habitat Value (Detailed descriptions at thurstonHCP.org. See **Definitions**.)

Category	Brief Category Description	Habitat Value	
		More Preferred Soils	Less Preferred Soils
1	Site occupied by Mazama pocket gophers + Standard vegetative quality	1.6	1.6
2	Site occupancy unknown, but within 656 feet of known occupancy + Standard vegetative quality	1.55	1.35
3	Site occupancy unknown, but more than 656 feet from known occupancy + Standard vegetative quality	1.2	0.75

Table 2: Cost per Credit (Updated annually to reflect land, labor and materials

	Mazama Pocket Gopher Sub-Species				
Species	YPG N	YPG E	YPG S	OPG	TPG
Cost per Credit estimate	$20,215	$17,137	$14,644	$51,111	$12,910

BEFORE YOU BEGIN

Confirm HCP/Federal Permit Participation

The list below removes some projects from participation. Other County codes still apply.

- Federal 4d Rule exemptions.
- Project is not on Covered Activities list. (Example: Mining is not covered.)
- 100% forest cover. (Definition is very specific. County staff must confirm.)

Use County HCP BMPs to Avoid/Minimize Impacts

- Use the County's HCP Best Management Practices to develop your project. Required by federal permit. Design changes may be requested if BMPs are not fully used.

4 STEPS FOR ESTIMATING GOPHER MITIGATION FEE

Step 1: Add up Total Project Impact Area (Use your site plan or estimate using a sketch)

Include **all** soil disturbance: Grading, filling, all structures and hard surfaces (like driveways), utilities, drinking water well, septic system and drain field, yard/lawn, garden, paths.

Step 2: Look Up Which Gopher Species is Mapped on Property

Go to https://map.co.thurston.wa.us/Html5Viewer/Index.html?viewer=Permitting.Main. Enter project property address or parcel number, then find and note:

- Sub-species (YPG N; YPG E; YPG S; OPG; TPG)
- Soil type (More preferred or Less preferred)
- Gopher occupancy category: 1-Occupied (on parcel), 2-Close (656ft/200m), 3-Not close.
- Option: Hire a specialist to do a site-specific soil delineation for entire parcel, instead of using County map. A County-approved qualified specialist must use HCP Appendix K.

Step 3 Find Habitat Value & Cost per Credit

Use species from Step 2 to find & note Habitat Value (Table 1) and Cost per Credit (Table 2).

Step 4 Calculate Estimated Mitigation Fee

4A-Find estimated credits needed: Impact Area x Habitat Value = Credits Needed.
4B-Estimate mitigation fee: Cost per Credit x Credits Needed = Mitigation Fee.

This form is for your planning and information purposes only. Other County permit application processes apply. Visit thurstonHCP.org for details. Fill-in-the-blank estimation form is on the front of this page.

E. Cultural Resources Assessment

CULTURAL RESOURCES REPORT COVER SHEET

DAHP Project Number: 2020-12-07391
(Please contact the lead agency for the project number. If associated to SEPA, please contact SEPA@dahp.wa.gov to obtain the project number before creating a new project.)

Author: Valentino, Alicia, Paula Johnson, and Amanda Taylor

Title of Report: Yelm Highway Community Park, Phase 1, Cultural Resources Assessment, Olympia, Thurston County, Washington

Date of Report: September 7, 2021

County(ies): Thurston Section: 40 Township: 17N Range: 1W
Section: 41 Township: 18N Range: 1W

Quad: East Olympia Acres: 53

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐ Yes ☒ No

Archaeological Site(s)/Isolate(s) Found or Amended? ☒ Yes ☐ No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:
TN-530

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

WILLAMETTE
CULTURAL RESOURCES ASSOCIATES, LTD.

Yelm Highway Community Park, Phase 1 Cultural Resources Assessment, Olympia, Thurston County, Washington

Yelm Highway Community Park, Phase 1 Cultural Resources Assessment, Olympia, Thurston County, Washington

Prepared by
Alicia Valentino, Ph.D., RPA, Paula Johnson, M.A., RPA, and Amanda Taylor, Ph.D., RPA

September 7, 2021

WillametteCRA Report No. 19-67
Seattle, Washington

Prepared for
City of Olympia
Parks, Arts & Recreation
Olympia, Washington

WILLAMETTE
CULTURAL RESOURCES ASSOCIATES, LTD.

Report Details

Project Name:	Yelm Highway Community Park, Phase 1
SHPO/DAHP Number	2020-12-07391
Agency:	
Agency Project Number	
Client:	City of Olympia, Parks, Arts & Recreation
Project Undertaking:	Park Master Plan Development
Regulatory Framework:	Governor's Executive Order 21-02
County:	Thurston
Legal Description:	Section 40, Township 17N, Range 1W; Section 41, Township 18N, Range 1W
USGS Quad	East Olympia
Project Acreage:	53
Survey Acreage:	53
Permit Number:	n/a
Curation Location:	n/a
Field Note location:	WillametteCRA, Seattle Office
Fieldwork Type:	Pedestrian Survey, Shovel Probes
Fieldwork Dates:	November 20-21, 2019 and March 16, 2021
Field Personnel:	Amanda Taylor, Gary Geiger, Pamela Pearce, Rowan Dinubilo, Paris Franklin, and Althea Fitzpow
Findings:	45TN530, Zahn Place
Recommendations:	Development of an Inadvertent Discovery Plan for Phase 1 project construction.

Executive Summary

The City of Olympia is developing the Yelm Highway Community Park Master Plan (Project), creating a design concept to guide future park development of an 86-acre parcel in Olympia, Washington. The Project will incorporate active and passive recreational amenities, preservation and protection of critical areas, and integration of public art. Phase 1 of the Yelm Highway Community Park will be on approximately 53 acres and will likely include sports fields, parking, and restrooms. The City purchased the land in 2018 from the Zahn Family, who had farmed the land since the 1930s.

This report summarizes the results of WillametteCRA's cultural resources assessment conducted for the Project. While no subsurface materials were encountered, a collapsed, historic-period brood house, part of Zahn Place, was recorded as archaeological site 45TN530. WillametteCRA recommends the site as not eligible for listing in the National Register of Historic Places; however, because Zahn Place extends outside the Phase 1 Project Area, future subsurface investigation and historic resource inventory may provide additional information which would change this eligibility recommendation.

Based on the results of this assessment, WillametteCRA recommends no additional archaeological work.

An Inadvertent Discovery Plan should be developed for use during Phase 1 Project construction.

Table of Contents

List of Figures

List of Tables

Photo on cover page: Flat topography in Project Area, view facing south-southwest.

Introduction

The City of Olympia is developing the Yelm Highway Community Park Master Plan (Project), creating a design concept to guide future park development of an 86-acre parcel. The Project is in Section 40 of Township 17N, Range 1W and Section 41 of Township 18N, Range 1W in Olympia, Washington, on the East Olympia 7.5' series topographic map (Figure 1, Figure 2). This is on Thurston County parcel 09330008002.

The Project will incorporate active and passive recreational amenities, preservation and protection of critical areas, and integration of public art. Phase 1 of the Yelm Highway Community Park will be on approximately 53 acres and will likely include sports fields, parking, and restrooms.The City purchased the land in 2018 from the Zahn Family, who had farmed the land since the 1930s. Approximately 60% of the 86-acre property is currently strawberry fields. Much of the southern third of the parcel is wooded; this portion of the parcel is outside the Phase 1 Project Area.

This report summarizes the results of Willamette Cultural Resource Associates (WillametteCRA's) cultural resources assessment conducted for the Project. ***No buried cultural materials were encountered during fieldwork, but site 45TN530, Zahn Place, was recorded. The site as currently recorded, consists solely of the collapsed brood house, a c.1920s structure that was used during the farm's operation. However, the site extends outside the Phase 1 Project Area, and while the site is recommended not eligible for listing in the National Register of Historic Places (NRHP), future subsurface investigation and historic property inventory outside the Phase 1 Project Area may provide additional information which would change this eligibility recommendation.***

Regulatory Framework

City of Olympia will be seeking a state grant for capital improvements from the Washington State Recreation and Conservation Office (RCO), which will trigger compliance with Governor's Executive Order 21-02[1] (EO 21-02). EO 21-02 requires state agencies implementing or assisting capital projects to consider how proposed projects may impact significant cultural and historic places. Under EO 21-02 an agency

[1] On April 7, 2021 Executive Order 21-02 superseded Executive Order 05-05.

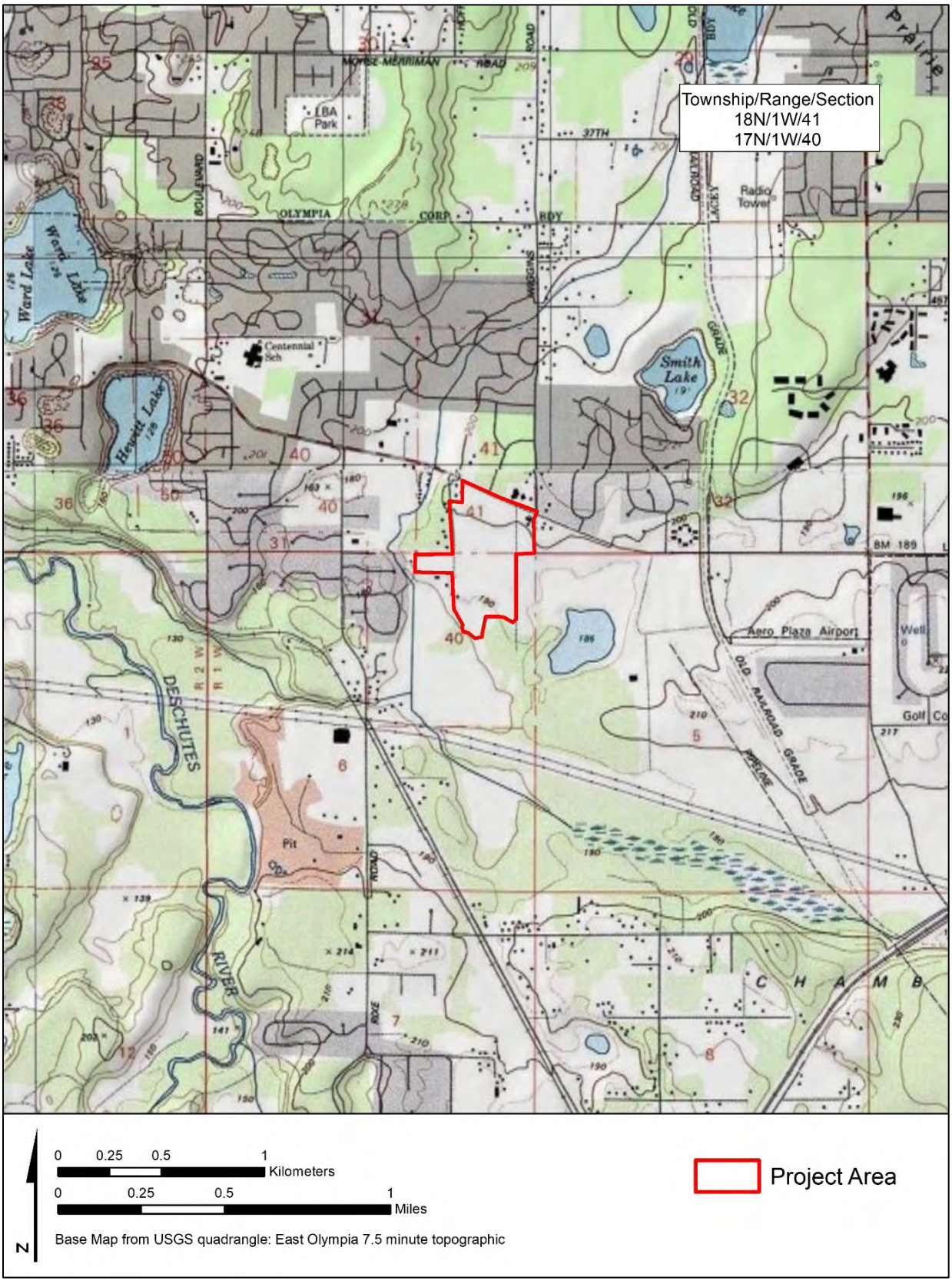


Figure 1. Yelm Highway Community Park Phase I Project Area.

Figure 2. Yelm Highway Community Park Phase 1 Project Area, aerial view.

must coordinate with the Department of Archaeology and Historic Preservation (DAHP) and affected Tribes. If cultural resources are identified during review, the agency is required to develop appropriate mitigation strategies and take reasonable action to avoid, minimize, or mitigate adverse effects to cultural resources.

Additional laws that apply to archaeological projects conducted within the State of Washington include: Archaeological Sites and Resources Law (RCW 27.53), Indian Graves and Records Law (RCW 27.44), Human Remains Law (RCW 68.50), and Abandoned and Historic Cemeteries and Historic Graves Law (RCW 68.60).

WillametteCRA contacted the Nisqually Indian Tribe, the Squaxin Island Tribe, and the Puyallup Tribe of Indians by email on November 12, 2019 to notify them of the Project. Brad Beach from the Nisqually Indian Tribe responded that he would like to send tribal representatives into the field to assist with the project; Jeremy Badoldman helped with the survey. Shaun Dinubilo, archaeologist for the Squaxin Island Tribe Cultural Resources Department, expressed interest in assisting with the survey and also joined for fieldwork.

Natural and Cultural Background

The Project Area is a flat agricultural area on the south side of Yelm Highway SE. It slopes gently to the south. There are residential homes west and east of the Project Area, and a wooded wetland area at the south end. Much of the Project Area consists of an active strawberry farming operation leased by Spooner Berry Farms. The original farmstead is located on the southwestern boundary of the Phase 1 Project Area (see Figure 2). Farm equipment, as well as abandoned and renovated buildings are present in that area today.

Natural Background

The modern landscape of western Washington is diverse and characterized by landforms and sediments produced across multiple spatial and temporal scales in glacial, deglacial, and non-glacial environments. Some of the physical features associated with earlier glacial and deglacial conditions are still readily visible in some places; other landscape features are the products of more recent Holocene geomorphic processes. The natural setting of a particular place on the landscape, such as the vicinity of this project, may either limit or attract human habitation and resource use, which in turn allows an assessment of the sensitivity of this area for archaeological remnants of past human activity. The geological setting, specifically, informs us of the

age and potential depth of archaeological remains that may still be found on the landscape, and places where archaeological deposits may still be preserved or eroded. This section reviews the natural setting of the project in terms of these aspects.

Geology and Geomorphology

The project vicinity is located approximately three miles south-southeast of Budd Inlet and eight miles west of the Nisqually River. Chambers Ditch runs along the west side of the Project Area and feeds the wetland to the south.

The modern topography and surficial geology of the region has been affected by multiple glaciations that advanced southward from British Columbia into the lowland between the Olympic Mountains and the western flanks of the Cascade Range. The Project Area is located at the interface of the Puget Lowland and the Southern Cascades physiographic provinces.

The latest Pleistocene glacial maximum, known in the Puget Lowland as the Vashon Stade of the Fraser Glaciation, began 17,000-18,000 years ago and ended abruptly with the onset of climatic warming about 14,000 years ago. Subglacial incision during ice advance carved out large troughs below the ice sheet, and rearrangement by meltwater during glacial retreat is responsible for the ridge-and-trough topography characteristic of much of the Puget Lowlands, which is dotted by kettle lakes. The last maximum extent of the Puget Lobe reached the vicinity of the Project Area, south of Tenino, and was over one kilometer (km) thick (Easterbrook 1993, 2003; Porter and Swanson 1998). Upon retreating, the glacier deposited sands and gravels in the form of glacial outwash plains.

The Southern Cascades physiographic province is characterized by moderate topographic variation with predominately northwest-southeast trending ridges that are divided by steep river valleys (Franklin and Dyrness 1988:21–22). The province is primarily comprised of andesite and basalt flows which extruded between the Eocene to the Holocene, with some outcroppings of granite scattered through the province. Alpine glaciers in the Cascade Range extended westward toward the lowlands between the Cascades and the Willapa Hills, during the last glacial maximum about 15,000 years ago.

The mapped surface geology for the area shows the relatively old age of natural surficial deposits in the immediate vicinity of the project (Schasse 1987). The mapped surface geology unit that encompasses the project is Vashon outwash gravel (*Qdvg*).

Soils across the Project Area are primarily mapped as Nisqually Loam Fine Sand that forms in sandy glacial outwash parent material. This soil type is found on 0-3 percent slopes on river terraces and characterized as loamy fine sand to 80 centimeters below surface (cmbs) underlain by loamy sand to 150 cmbs. A small portion of the Project Area is mapped as Cagey Loamy Sand that forms in sandy glacial drift and is found at 0-4 percent slopes on terraces. It is characterized as loam sand at 0-70 cmbs underlain by fine sand to 150 cmbs (NRCS 2019). Geotechnical investigation completed in 2019 bisected the Project Area with boreholes along a north-south transect, and an additional borehole on the east side of the Project Area (Shannon & Wilson 2019a). Soil was described as dark brown silty sand to 3.5 feet (ft) below ground surface (bgs) in the northernmost boring near Yelm Highway SE. All other boreholes were comprised of poorly graded sand to 3-6 ft bgs.

Ecology

Regional pollen data recovered from cores in lakes and wetlands around Puget Sound show substantial shifts in the composition and distribution of regional vegetation since the end of the Pleistocene (Tsukada et al. 1981; Whitlock 1992). As land emerged after the ice sheets retreated, the Puget Lowland was colonized by pioneer species such as lodgepole pine, bracken fern, and red alder, followed by Douglas fir a few centuries later (Barnosky 1985). As the climate continued to warm, grasslands and oak/hazel woodlands were established and, after a brief period of suppression, Douglas fir once again became the dominant tree species between 10,500 and 7,000 years ago. At the height of postglacial warming, between 10,000 and 5,000 years ago, effective moisture decreased and the precipitation pattern exhibited a marked seasonality characterized by increased levels of summer drought. During this period, fires were more common and local prairies in the central and southern Puget Lowland expanded their ranges. After about 7,000 years ago, cedar and hemlock pollen began to increase until about 5,000 years ago. The modern climate regime was established by about 5,000 years ago with cool, moist conditions and closed canopy forests dominated by red cedar and hemlock (Tsukada et al. 1981; Whitlock 1992). The climate since then has been marked by small-scale changes fluctuating between warmer/drier and cooler/moist conditions (Leopold et al.1982).

The Puget Lowland and parts of the Southern Cascades are covered with extensive stands of coniferous forest that comprise the *Tsuga heterophylla* (western hemlock) vegetation zone. The species comprising the potential vegetation of this zone are western hemlock, western red cedar, and Douglas fir, with Douglas fir being the

dominant species (Franklin and Dyrness 1988). Second-growth forest understories are typically dense, consisting of shrubs and herbaceous species dominated by sword fern, salal, Oregon grape, ocean spray, blackberry, red huckleberry, and red elderberry (Franklin and Dyrness 1988), all of which were useful to the indigenous populations and subsequent generations. The vegetation in the Project Area has been extensively modified by historic and modern agricultural. Strawberry plants from the Spooner Berry Farms operation are still present in the northern part of the Project Area. The natural vegetation bordering the Project Area to the south includes Gary oaks, Douglas fir, western red cedar, big leaf maple, red alder, invasive blackberry, canary grass, sword fern, and other shrubs and grasses.

The vicinity of the Project Area historically supported a wide range of animals (Angell and Balcomb 1982; Kruckeberg 1991; Larrison 1970; Larrison and Sonneberg 1968). Large and medium-sized mammals include black-tailed deer, elk, and black bear; fur-bearing and smaller mammals include rabbit, fox, wolf, muskrat, and beaver. Historic and modern salmonid populations that have used Johnson Creek, the Skookumchuck River, and presumably their tributaries for spawning habitat include runs of chinook (spring and fall stocks), Coho salmon, and winter steelhead (Smith and Wenger 2001). During critical areas report fieldwork, biologists identified Mazama pocket gopher mounds in the Project Area. The Mazama pocket gopher is a state and federally-listed threatened species. Little brown bat, big brown bat, and Yuma myotis bats breeding and/or roosting areas are also mapped within the Project Area. Chambers Creek which runs along the west side of the Project Area is listed as a fish-bearing stream for coho salmon and cutthroat trout (Shannon & Wilson 2019b).

Cultural Background

Archaeological, ethnographic, and historical information about the region and the project vicinity reflects land use of this area for over 10,000 years. The history of Native American settlement and subsistence in the nearby uplands, river valleys, and tidewaters both before and after European American contact reveals important patterns that speak to the potential for archaeological resources and culturally important places. The more recent history of property ownership, subdivision, and development during the 20th century provides important information that can be used to evaluate the significance and integrity of historic resources within the project limits.

Little archaeological evidence has been found so far associated with Late Pleistocene and early Holocene human occupation of the Puget Lowlands or the Cascade Range. Archaeological investigations have been completed at archaeological sites elsewhere

representing Native American settlement in the Puget Lowland at the Late Pleistocene-Holocene transition (Kopperl et al. 2015; Kopperl et al. 2016). However, our knowledge of this time is otherwise limited to several isolated finds of artifacts diagnostic to this period but lacking context that are sparsely distributed across the region. Some of these isolated finds are projectile points with distinctive flaking patterns, often termed Clovis points after a continent-wide technological tradition associated with big-game hunting by highly mobile people at the end of the Ice Age. In 1983, an isolated Clovis point base was identified on the Pierce College campus near a kettle lake in Lakewood about 30 miles northeast of the Project Area (Avey ca. 1990), and a fluted point was discovered within peat deposits near Maple Valley 50 miles northeast of the Project Area (Meltzer and Dunnell 1987). Additional Clovis finds have been reported closer to the Project Area near Olympia in the southern Puget Lowland and from within the Chehalis River valley, but lack any detailed location information (e.g., Croes et al. 2008; Osborne 1956).

More common in the Puget Lowland and foothills are Olcott sites, which date to the early to middle Holocene and are named after the type site in Snohomish County. They are usually found on glacial outwash surfaces and inland river valley terraces (e.g., Chatters et al. 2011; Kidd 1964). The distinctive Olcott tool-kit used by Native Americans at this time consisted of large, leaf-shaped and stemmed points and flake tools that they manufactured from locally available cobbles, which would have provided expedient raw material well suited for highly mobile hunting and gathering land use patterns. This terrestrial-oriented, mobile hunting and gathering pattern may have persisted for over 6,000 years; its end was marked by increasing reliance on marine and riverine resources. Sites containing stone tools considered to be Olcott were identified at the Skookumchuck Reservoir 15 miles southeast of the Project Area (Schalk et al. 2001). All of the recorded sites on the reservoir are located at the confluence of small streams and the Skookumchuck River.

In the Middle Holocene (8,000-4,000 years ago), inhabitants of western Washington used both marine and terrestrial resources. A variety of stone tool traditions date to this time period with a general trend towards increased use of cherts and microblades, leaf-shaped and large stemmed points and ground stone tools (Ames and Maschner 1999; Carlson and Hobler 2008). Shell midden sites date to this period in maritime shoreline settings (Carlson 1990). The DuPont Southwest site (45PI72) is a shell midden approximately 10 miles southwest of the project and situated on a terrace above Puget Sound. It is notable both for its earliest radiocarbon dates of about 5,000 years before present (BP), making it one of the oldest identified shell middens in the southern Puget Lowland, and an early archaeological manifestation of intensive utilization of marine

resources (Daugherty 1993). The Tolt site (45KI464) is an example of an inland site that dates to this time period, although it is about 70 miles northeast of the Project Area in the Cascade foothills. The Buck Lake site (45PI438), within Mt. Rainier National Park contains lithic artifacts in pre-Mazama stratigraphic context dated to approximately 7,000 years ago (Burtchard 2007). In Centralia, on the Chehalis River, not far from its confluence with the Skookumchuck River, radiocarbon dates from pit and hearth features at the Mellen site (45LE125) indicate human occupation there between about 7,000 and 1,000 years ago, and botanical analysis suggests fuelwood and a diverse array of edible plants were consumed at the site.

After about 5,000 years ago, larger populations organized in more complex ways to utilize a wide range of locally available resources including large and small mammals, shellfish, fish, berries, roots, and bulbs, with an increasing emphasis on salmon over time. The distribution and diversity of site types reflects the increasing richness of habitats that were an integral part of Native American subsistence, such as the prairies near the project. Ground stone, bone, antler, and shell tools became increasingly common and more diversified through time. Full-scale development of marine-oriented cultures on the coast and inland hunting, gathering, and riverine fishing traditions as represented in the ethnographic record are apparent after about 2,500 years ago. Large semi-sedentary populations occupied cedar plank houses located at river mouths and confluences and on protected shorelines. Artifacts made of both local and imported materials occur, indicating complex and diversified technologies for fishing, hunting, food processing, and storage. Near Napavine, 30 miles south of the Project Area, fire hearths, cooking pits, an earth oven and numerous tools for hunting fishing and woodworking were excavated in 1972 at the Hamilton Site (45LE172). The radiocarbon dates from the site indicated repeated occupations over a period of 2,500 years, the oldest date being 2,530 +/- 95 BP (Jermann 1980). Increased use of fish, shellfish, and plants is found, with prairie burning an important management technique to increase plant production and terrestrial mammal habitat (Ames 1999; Boyd 1999). A systematic analysis of radiocarbon dates in the southern Puget Sound has not yet been compiled; however, the few shell midden sites with dates in the Puget Sound region date to the late Holocene (Croes et al. 2005; Lewarch et al. 2002; Stein and Phillips 2002; Taylor 2007).

Native Peoples

The Project Area is within the traditional use territory of the ancestors of the Squaxin Island and Nisqually peoples who spoke Southern Lushootseed and lived in the various

inlets and interior of what is now Mason, Thurston, and Pierce counties. Their neighbors to the south were the Upper Chehalis, who lived along the Black River. The people had strong ties to the inlet watersheds and utilized the marine shorelines for resources, and the waterways were travel corridors, navigated by canoe. Villages were located both along tidewater and on the islands of southern Puget Sound (Hajda 1990). The Puyallup people who are traditionally associated with the Puyallup River Basin are also associated with this area through family connections, exchange, and resource gathering. Occupying the seven-inlet region of southern Puget Sound were the Sa-He-Wa-Mish of Hammersley Inlet, the Noo-She-Chatl of Henderson Inlet, the Squi'Aitl of Eld Inlet, the T'Peeksin of Totten Inlet, the Squawksin of Case Inlet, and S'Hotl-Ma-Mish of Carr Inlet and the Steh-Chass of Budd Inlet (Squaxin Island Tribe 2018).

There are no place names recorded by Euroamerican ethnographers in the vicinity of the Project Area. Waterman (2001) recorded that what is today Olympia was a village named *B1s-teɛ'txûd* meaning "frequented by black bears." The village was located on what is now the west side of the city. At the time that Waterman recorded this information in the early 20th century, he noted that since Euroamerican occupation, native people called Olympia *stEtc!ä* which means "splicing two things together." He conjectured that this was due to the causeway across the inlet.

Prior to widespread European American settlement in the southern Puget Lowland, Native communities organized their economies around the seasonal availability of various resources (Haeberlin and Gunther 1930; Smith 1940). Winter villages on tidewater and along major rivers served as the focal point from which groups would journey to temporary camps during the spring, summer, and fall. Some moved to camps along streams near fishing grounds during salmon runs while smaller groups would hunt, gather plant resources, and fish for other, non-salmonid fishes. Gathering was most intensive during spring and summer. Roots and bulbs, such as camas and sunflower, were collected from the prairies in the uplands near the project, and acorns were harvested from the Nisqually Plains. Blackberries, strawberries, and other berries were found in both forest and prairie environments in the summer (Gunther 1945).

Villages in the Puget Lowland usually consisted of between two and four long houses, up to 100 feet long each and made of cedar planks with shed or gabled roofs. Each house sheltered up to four families and was occupied from late fall to early spring (Carpenter 2002). Distinctions between villages were traditionally based on watersheds, with people from each village using the areas near the village as well as upstream rivers and tributaries (Smith 1940). People from this area travelled to the Cowlitz River Valley

and to Yakama country east of the Cascades along well-used trails crossing the Cascade Mountains and south over the low divide to the Chehalis River basin (Taylor 1974). Early European American settlements in the south Puget Lowland, including the Hudson's Bay Company farm that later became territorial Fort Steilacoom north of the project, provided opportunities for trade and employment as well as flashpoints for conflict during and after the period of treaty negotiations with the territorial government (e.g., Carpenter 1986; Heath 1979). The arrival of European-introduced diseases after about AD 1700 caused widespread disruptions to Native lifeways, including dramatic population declines (Boyd 1990). However, continuity of Native presence in the region and in the project vicinity itself is attested by Native place names and known activity areas.

In 1853, Isaac Stevens, the first Governor of Washington Territory and Superintendent of Indian Affairs, began the process of treaty-making with tribes to end their legal land claims and consolidate them onto reservations (Marino 1990). The Nisqually and Squaxin Island, along with the Steilacoom and Puyallup, were signatories to the Medicine Creek Treaty of 1854, at a place known known as *She-nah-da-dob*, in the treaty spelled *Sh-nah-nam* (Lane 1975:29) which created the Nisqually, Puyallup, and Squaxin Island reservations. While many Native families moved to Nisqually in 1857 (Smith 1940), others moved to Squaxin Island. Initially the Squaxin Island Reservation consisted of a small island, four miles long and one-half mile wide (Squaxin Island Tribe 2018), but in the late 1800s, Squaxin people began moving off the island. Today the Squaxin are settled in Kamilche, between Little Skookum and Totten Inlets (Squaxin Island Tribe 2018). The Nisqually Indian Community is located approximately 7 miles south of the Project Area along the Nisqually River.

European American Settlement History

In 1792, Peter Puget's Royal Navy crew entered Eld Inlet and met a large party of Squaxin peoples, and named the inlet "Friendly Inlet" based upon their experience (Anderson 1939). In 1841, the U.S. Exploring Expedition under Lt. Charles Wilkes came to the area and named Eld Inlet in honor of Midshipman Henry Eld, one of the officers of the expedition (USGS 1936). Budd Inlet was named after Midshipman Thomas A. Budd, also a member of that expedition (Phillips 1971).

The first European Americans to settle in the Puget Sound area were fur trappers employed by the Hudson's Bay Company (HBC) after 1833. Most of these individuals were part of mobile trapping and trading expeditions, headquartered at the first Fort Nisqually site, near present day Dupont on the south shore of Puget Sound. Permanent

European American settlement in the region began in late 1846, when a small group of settlers established farms in what is now Tumwater. With the passage of the Donation Land Act in 1850, more European Americans arrived and tensions with the Tribes led to the treaty negotiations discussed above. The Donation Land Act those who settled in Oregon Territory by December 1, 1850, up to 320 acres for an unmarried man and 640 acres for a couple.

In the mid-1850s, developments such as stores, brickyards, boat builders, dry docks, and hotels developed around the waterfront of Budd Inlet, just downhill and east of the Project Area. Originally named Smither or Smithfield after settlers Levi Smith and Edmund Sylvester, Olympia quickly became a hub of maritime commerce and was platted in 1850 and incorporated in 1859. People bought and sold goods using trails and steamboats of the Mosquito Fleet. Chinese immigrants arrived beginning in the 1840s and lived on 4th Avenue. In 1853, when Washington Territory was formed, Isaac Stevens named Olympia the provisional capital. In 1855, the territorial legislature confirmed the decision. Olympia was incorporated as a Town on January 28, 1859 (Stevenson 1985).

History of the Project Area

The Project Area first left federal ownership when it was purchased by William Dunham in 1863 under the authority of the Oregon Donation Act. The area was known as Chambers Prairie after the Chambers family who settled the area by the early 1850s (Figure 3).

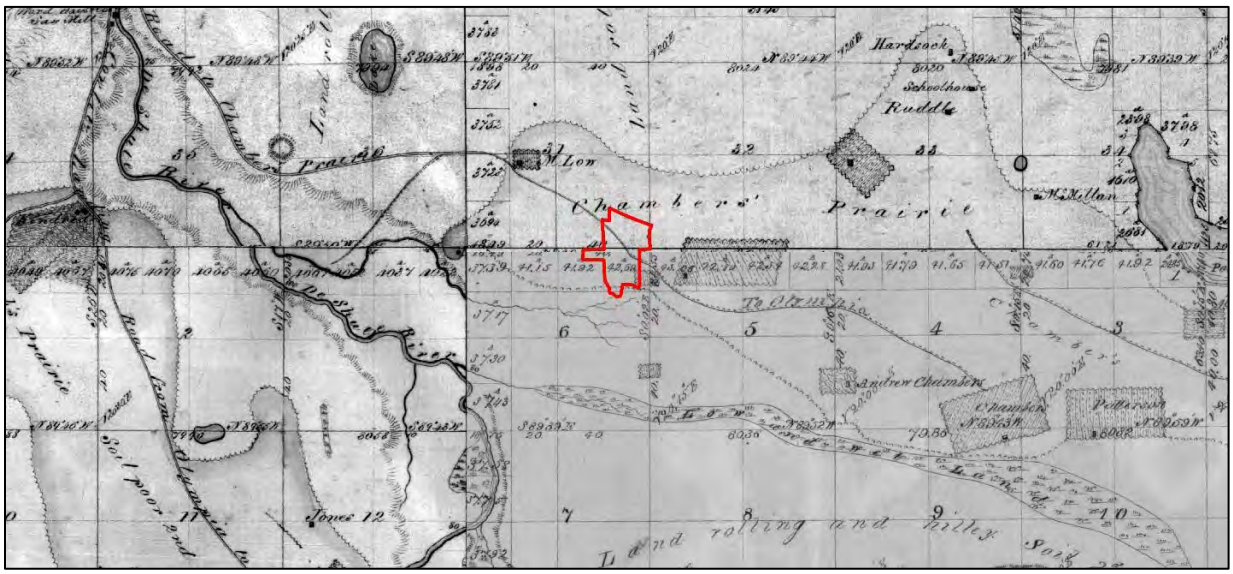


Figure 3. Phase 1 Project Area mapped on 1853 BLM GLO map.

The Dunham family owned the property through at least 1895. On the 1883 Bureau of Land Management (BLM) General Land Office (GLO) map, the property is not mapped as an agricultural field (Figure 3). The Dunhams built a two-story board-and-batten home on the property (Figure 4).

Figure 4. Cameron prairie home. Dunham home at rear (Source: James and Sandra Zahn).

The Camerons purchased the land from the Dunhams in the late 1800s and established their homestead and farm. John and Mary Cameron, and their children William, Martin, Oliphant, and Emma, immigrated to the United States in the early 1880s from Nova Scotia, Canada. The Camerons lived in a two-story prairie home they built near the Dunham residence, which was later used as a wood shed (see Figure 4). They ran a horse farm and built numerous structures including their home, a machine shop, hay barn, milk parlor, blacksmith shop, and brood house (Figure 6, Figure 7). The buildings were fairly spread out on the property to accompany the wide turning-radius of the horses and their farm equipment. The Chicken/Long Barn is possibly the oldest remaining building on the 86-acre master plan property, having been built c. 1900 by either the Camerons or the Dunhams (Figure 8) (James Zahn, personal communication). Ollie took over the farm at some point, with Mary and John continuing to live there along with Emma who never married. Brother William and his wife farmed

nearby by the 1910s. Mary Cameron died in 1917 and John Cameron died in 1921. Ollie Cameron died in 1956 at age 81.

Figure 5. Mary (or Emma Jane) and John Cameron, on the front porch of their prairie home (Source: James and Sandra Zahn).

Figure 6. Ollie (left) and William "Willie" (right) Cameron, horse farming (Source: James and Sandra Zahn).

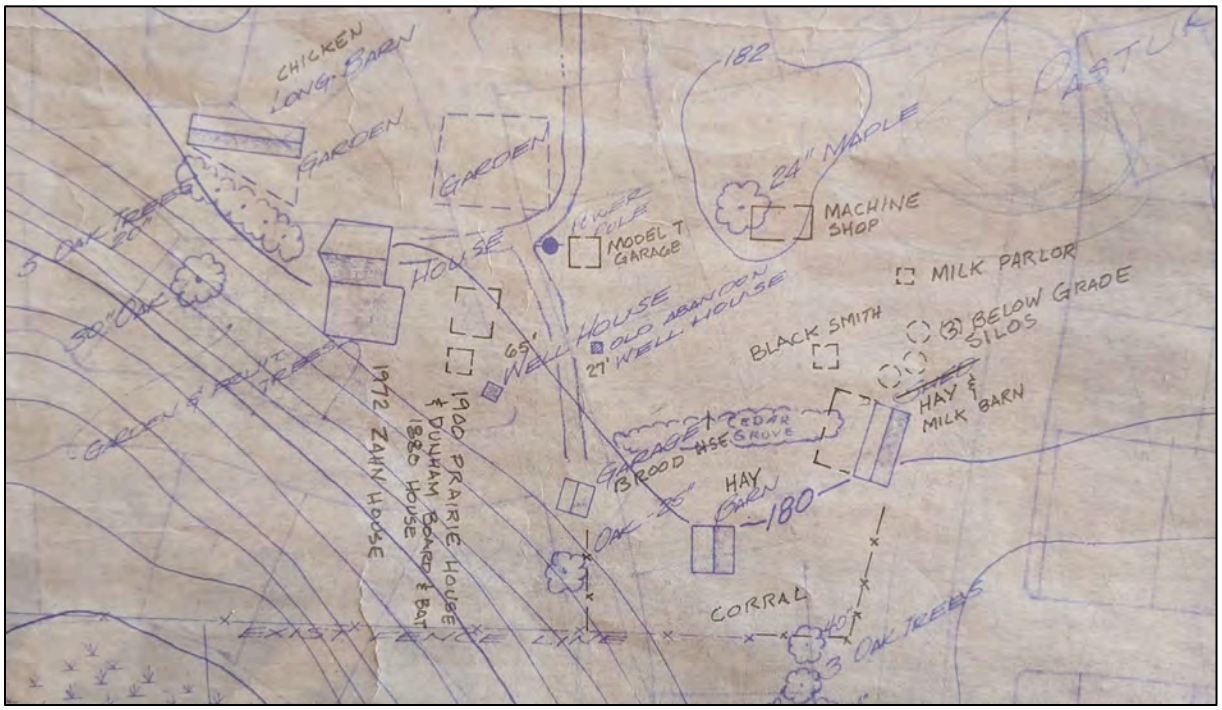


Figure 7. Sketch map of buildings on the property. Only the 1972 House, Well House, Chicken/Long Barn, and collapsed Garage/Brood House remain. North is at the top. Base map is James Zahn's 1977 development plan for the property (Source: James and Sandra Zahn).

Figure 8. Chicken/Long Barn, c. 1900; view southeast (Source: James and Sandra Zahn).

Albert Zahn purchased the property from the Camerons in the 1930s. Albert's parents were of German descent and came to Lind, Washington, in Adams County, having emigrated from Russia. They cultivated wheat fields for a number of years until the crops failed and they relocated to Olympia. Albert Zahn and his brothers moved to Gull Harbor and operated strawberry fields. Albert sold his property and moved to the Project Area in the 1930s, having purchased the property from the Camerons (Figure 9) (James Zahn, personal communication).

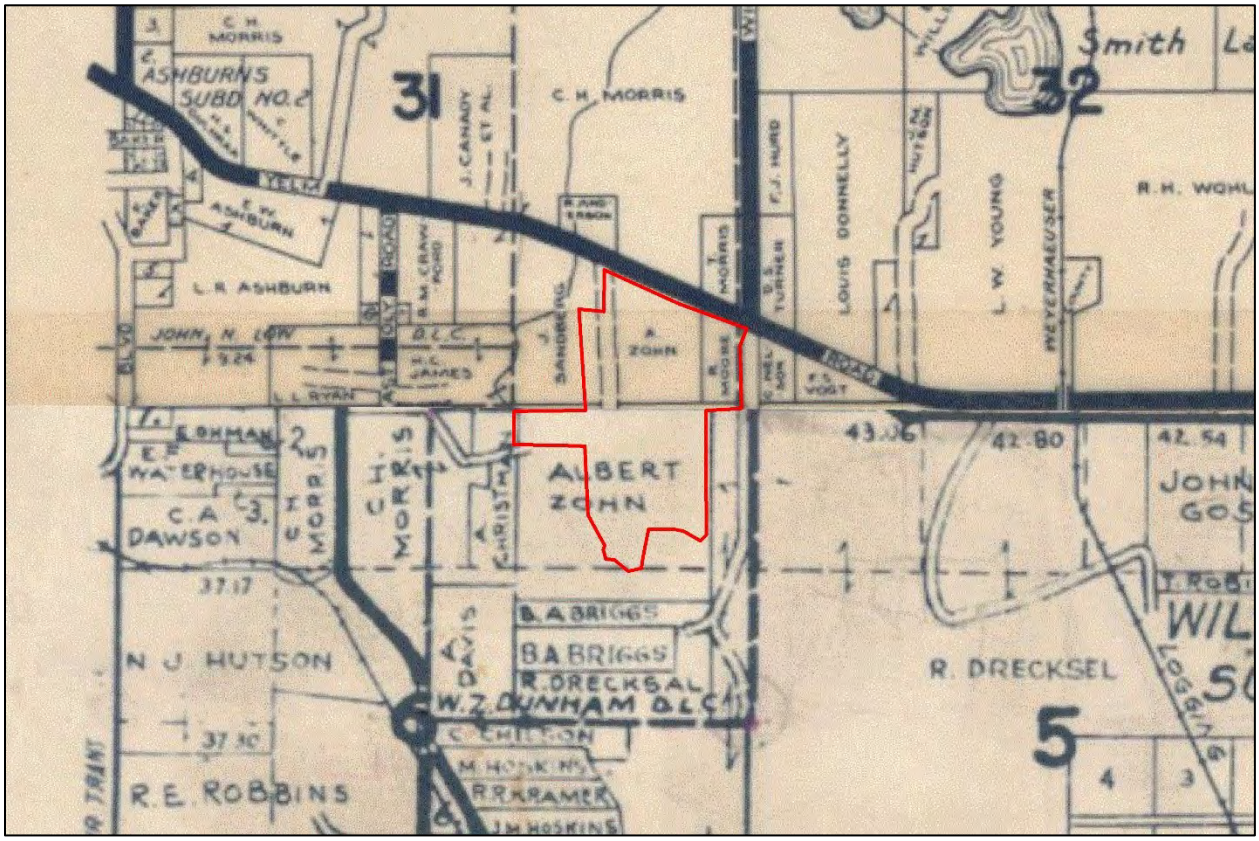


Figure 9. Phase 1 Project Area mapped on 1962 Metsker map.

In census records, Albert and his wife Elda [nee Teitzel] are both listed as living on a farm, but he also worked intermittently as a longshoreman. Albert's son James (Jim), described the farm operations: "we were kind of a MacDonald farm. We sold poultry, we sold eggs, we sold milk" (James Zahn, personal communication). They sold milk to Darigold out of Chehalis, sold and baled hay, sold grain, raised chickens, and maintained pastureland. They raised and sold beef and geese. They were one of the first farms in the area to have tractors, so they rented out tractor work and helped their neighbors bale and combine their hay (James Zahn, personal communication).

Many of the outbuildings used by the Zahns were constructed during the Camerons' tenure on the property. They were maintained until they could no longer be used or were no longer needed.

After farming the property for several decades, Albert sold the property to his son Jim in the 1970s. Initially, Albert sold the property to developer John Muirhead while James was stationed in Vietnam. Upon Jim's return, Jim expressed his longstanding interest in owning the property to John, and John rescinded his offer and Jim purchased the property. By this time the larger farms in the area were being sold and developed. This was one of the last operating farms in the vicinity, though Jim tried repeatedly to develop it as single-family homes. For decades, he has rented a portion of the land to the Spooners for their u-pick strawberry fields (James Zahn, personal communication).

Once Jim purchased the property, he designed and built the extant home on the property for his parents to live in, since he and his family were living between Hawaii and Seattle. He later rented the home to an acquaintance before moving there himself (James Zahn, personal communication).

Jim sold the property to the City of Olympia in 2018. He retains a lifetime lease of seven acres, which will revert to the City upon his death.

Previous Archaeology/Literature Review

WillametteCRA reviewed records on file with the Washington DAHP's online database system (WISAARD) on November 17, 2020, to identify previous cultural resource studies and archaeological or historical resources at or near the project location. The WISAARD review indicated two previous cultural resources studies conducted for the same project within one mile of the Project Area (Table 1). The projects, conducted in 2004 and 2005, consisted of subsurface investigation in advance of a proposed road widening of Yelm Highway for Thurston County Roads and Transportation Services (Kopperl 2004, 2005).

Table 1. Previous Cultural Resources Investigations within 1 mile of the Project Area.

DAHP Report #	Reference	Type of Work	Distance from Project (mi.)	Archaeological Resources in Vicinity
1344809	Kopperl 2005	Pedestrian survey and shovel probes	0.5 mi northwest	No
1346261	Kopperl 2004	Pedestrian survey and shovel probes	0.3 mi northwest	No

No archaeological sites or cemeteries were identified within one mile of the Project Area. Several historic buildings have been recorded within approximately one mile of the Project Area, including three historical houses and an associated barn, the Central City Light hydroelectric power plant, the Spurgeon Creek Grange building, two historic schoolhouses, and the Smith farm silo (Table 2). None of these are adjacent to the project parcels. None are anticipated to be impacted by the proposed Project.

Table 2. Previously Identified Historic Resources within 1 mile of the Project Area.

Property ID	Site Name	Site Type	Relation to Project Area	Significance
497563	-	House	0.36 mi W	Not Eligible
484201	-	House	1.06 mi NW	No Determination
20192	-	House and Barn	0.52 mi E	Not Eligible
26020	Centralia City Light Power Project	Hydroelectric Power Plant	0.52 mi E	No Determination
18953	Freedom Hall/Spurgeon Creek Grange	Community Hall	0.56 mi E	No Determination
19002	Collins School	School	0.57 mi E	No Determination
18958	Chambers Prairie School	School	0.68 mi NE	No Determination
19961	Smith Farm Silo	Silo	1.1 mi NE	No Determination

Expectations

The Washington state archaeological predictive model categorizes the Project Area as having a high to moderate risk of encountering intact, buried Native American archaeological resources. However, the long history of agriculture in the Project Area may have disturbed or destroyed features or artifact concentrations. The southern

portion of the Project Area nearer to the wetland is considered to have a slightly higher probability of precontact resources due on proximity to subsistence resources.

There is higher risk of encountering buried historic resources near the Zahn homestead.

Field Methods and Results

No significant subsurface cultural resources were found during field survey of the Phase 1 Project Area. We found no precontact or historic-period artifacts. One collapsed, historic-aged structure is within the Project Area: a brood house related to the Zahn farm. It was recorded as archaeological site 45TN530.

A note on the project schedule: cultural resources fieldwork was conducted in November 2019 and finalizing the report was put on hold while the design team continued to refine the design and further delayed due to the COVID-19 pandemic.

Methods

Fieldwork was initially conducted on November 20 and 21, 2019 by WillametteCRA archaeologist Amanda Taylor and field technicians Gary Geiger, Pamela Pearce, and Rowan Dinubilo. Squaxin Island Tribal Representative Shaun Dinubilo and Nisqually Indian Tribe Representative Jeremy Badoldman assisted with fieldwork. Weather conditions were cold and fair on November 20, cold and foggy on November 21. Following the results of fieldwork, additional investigation was conducted on March 16, 2021 by WillametteCRA archaeologists Paris Franklin and Althea Fitzpow. Weather conditions were sunny and cold. Former property owner James Zahn visited during all three days of fieldwork.

During both the November and March fieldwork sessions, the Project Area was investigated with pedestrian transects at 5-meter intervals. Shovel probes were placed to sample the landscape along a north-south transect; east-west transects were placed to sample potentially culturally sensitive areas (described below). Each shovel probe measured approximately 40 cm (1.3 feet) in diameter, was excavated in 20 cm (8-inch) arbitrary levels, and was terminated at approximately 100 cmbs (3.3 feet), or when depth, geologic context, or obstructions prevented further excavation. Spoils were screened through ¼-inch mesh hardware cloth and once sediments were examined, observations regarding soil color, texture, composition and observed cultural material were recorded on standard forms. Upon completion, each probe was backfilled. No cultural materials were collected. Universal Transverse Mercator (UTM) coordinates for

each shovel probe were recorded with a handheld global position system (GPS) unit, and digital photographs were taken of the Project Area and excavated probes, and the subject matter recorded on a standard photo log.

Results

Ground surface visibility was 80% in plowed and tilled portions of the central Project Area (approximately 50% of the Phase 1 Project Area). Visibility was poor on the southern, eastern, and western sides of the Project Area, which were covered in ornamental grasses.

During pedestrian survey, WillametteCRA observed a flat, plowed surface with sparse trees and little change in topography (Figure 10). WillametteCRA also noted a collapsed historic outbuilding on the boundary of the Phase 1 Project Area. Mr. Zahn noted that the structure was a brood house that was built in the 1920s and had been used for decades. The structure had fallen into disrepair and collapsed in the last few years. The brood house, which is in ruins, was recorded as archaeological site 45TN530 (see below).

Figure 10. Flat topography in Phase 1 Project Area, view facing south-southwest.

The current (1972) Zahn house was built on the original homestead (Zahn Place), outside of the Phase 1 project footprint (Figure 11). Mr. Zahn pointed out the former locations of a silo and historic barn but there was no refuse or change in topography that mark the locations of these areas (Figure 12; Figure 13).

During the November fieldwork, 52 shovel probes (SPs) were excavated in the Phase 1 Project Area (see Figure 11). SPs 1-26 were excavated along a north-south transect. SPs 27-31 extended west from SP 19 to identify subsurface artifacts or features associated with historic structures at Zahn Place. SPs 32-44 were placed east of SP 5 to sample the property on the east side of the Project Area. SPs 45-52 were located to sample the small rectangular field on the west side of the Project Area.

During the March fieldwork, WillametteCRA excavated an additional ten shovel probes (SPs 54-63) to investigate both the southernmost portion of the Project Area near the wetland, as well as that area within Zahn Place. Probe number 53 was not used. All probes were negative for cultural materials.

The contents of subsurface shovel probes were consistent throughout the Project Area (Appendix A), particularly SPs 1-44 and 54-63. The soils were generally characterized by dark brown silty sand (A-horizon/plow zone) to about 80 cmbs, underlain by yellowish-brown fine sand glacial deposit between 50-80 cmbs. In most cases, there were few stones, although rock content increased towards the south.

The stratigraphic profiles on the west side of the Project Area (SPs 45–52) were more variable with yellow and brown lenses; after we had completed these probes Mr. Zahn noted that the area had been substantially disturbed when it was used as a gravel pit and later filled. Topography in that area is currently level (Figure 14).

Figure 11. Yelm Highway Community Park Phase 1 Project Area with Project Elements and Shovel Probe Locations.

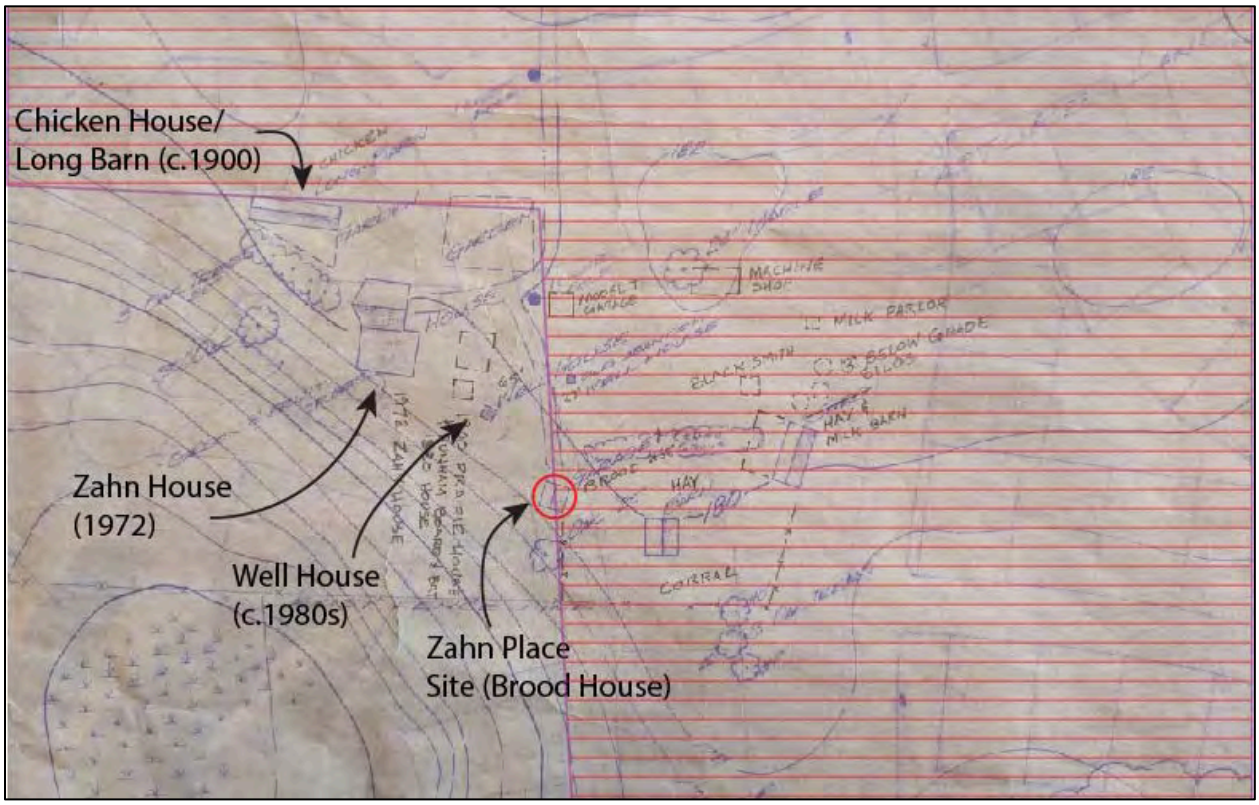


Figure 12. Sketch map of extant buildings at Zahn Place. North is at the top and the Phase 1 Project Area hatched in red. (Base map source: James and Sandra Zahn).

Figure 13. Arrows marking original location of former farm structures, view facing west.

Figure 14. Western portion of the Project Area, view facing east.

45TN530, Zahn Place

This site consists solely of a collapsed brood house built by the Camerons c.1920. It was used during both the Cameron and Zahn farm operations until it collapsed in 2018. The brood house was one of many structures built by the Camerons, including a milk parlor, a blacksmith shop, and a machine shop (see Figure 12); it is the only resource identified in the Phase 1 Project Area. During the Zahn operations the brood house was used for raising chickens and had incubators and a Dutch oven for heat. Later, it was used as a granary and finally as a garage (Figure 15). It had undergone repair a number of times before its collapse.

The brood house had a concrete foundation and lumber frame with clapboard siding. When photographed in 2020, it had an asphalt shingle roof. The structure measured roughly 20-by-20 feet.

Statement of Significance

While the brood house is directly associated with the farming tradition of the area, and was part of one of the last large farm operations in the vicinity (Criterion A), it does not represent a significant contribution to the history of farming in the region. The Cameron and Zahn families, while long standing Olympia-area farmers, do not fulfill the requirements for NRHP significance under Criterion B, particularly related to their farming. Further, even when still standing, the vernacular character of the structure is not significant (Criterion C). Most historic information about the brood house is gained from the photographs and maps that are available rather than from the collapsed structure (Criterion D). Further, as a structure in ruins, the brood house does not have integrity of design, workmanship, feeling, or association. For these reasons, the site as currently documented is recommended not eligible for listing in the NRHP. However, the extent of Zahn Place has not been fully documented and it is anticipated that future subsurface investigations within the boundaries of Zahn Place, particularly near the former locations of the Dunham or Cameron homes, could uncover cultural materials that may alter this recommendation.

Figure 15. Brood house (date unknown); view southeast (Source: James and Sandra Zahn).

Figure 16. Brood house, 2020; view northeast.

Figure 17. Brood house, 2020; view southwest.

Discussion

No artifacts and very little modern refuse was encountered during fieldwork, including the probes excavated in the area where the historic structures had been located (SPs 27-31 and 59-60). When the buildings were removed, they were likely torn down and refuse materials were hauled off the property or placed elsewhere. The farm buildings would not have had foundations, and the area has subsequently been plowed for crops.

The northeast area had been more minimally impacted by agriculture due to several stands of trees (SPs 32-44) (Figure 18). Mr. Zahn shared a rifle he found while plowing on the property several years ago (Figure 19). The rifle may be a Remington Rolling Block-style that was popular from the 1870s-1900s, but could have been used after that time (Historian Alan Archambault, personal communication, November 26, 2019). This was an isolated find.

Along the main north-south transect, shovel probe and geotechnical data indicated deep deposition of dark brown silty sand to 50-80 cmbs. Uniform appearance of the sediment and loose structure indicates mixing through plowing and agricultural use. It is unlikely that intact cultural deposits would be found in this heavily modified section, north of SP 23. No artifacts were noted on the ground surface in plowed areas. If a substantial precontact site were present, it is likely that we would have noted surface lithic artifacts, or would have intersected the site in subsurface probes. Additionally, no cultural resources are expected in the western segment of the Project Area near SPs 45-52 since the area has been modified through use as a gravel pit and later for filling.

The southernmost tip of the Phase 1 Project Area adjacent to the wetlands, was considered to have a higher probability of containing precontact cultural resources due a greater likelihood of productive natural resources. However, probes excavated here (SPs 54-58 and 61-63) were negative for cultural remains and sediments encountered do not suggest a higher likelihood of containing cultural materials. The remainder of the Project Area has a low likelihood of precontact cultural resources due to distance from water sources and extensive ground disturbance caused by agricultural activities.

Figure 18. Eastern portion of the Project Area, view facing east.

Figure 19. Mr. Zahn holding a rifle found on the property during plowing.

Conclusions and Recommendations

WillametteCRA conducted pedestrian and subsurface surface archaeological survey of the Yelm Highway Community Park Phase 1 Project. No cultural materials were found during subsurface survey; the collapsed brood house was recorded as an archaeological site. WillametteCRA makes the following recommendations:

1. WillametteCRA recommends that the City request concurrence from DAHP that the brood house (45TN530) is not eligible to the NRHP, so that the collapsed structure can be removed during Phase 1.
2. Zahn Place has not been fully documented and other portions of the historic property outside the Phase 1 Project Area may be considered eligible to the NRHP. No historic cultural materials were encountered during Phase 1 subsurface investigation, and no additional archaeological work is recommended in the Phase 1 Project Area.
3. WillametteCRA recommends that an Inadvertent Discovery Plan (IDP) be developed by a cultural resources management professional for use during construction of the proposed Phase 1 project. The IDP will outline the procedures to be followed if cultural materials are identified during construction. In order to develop an IDP, a professional archaeologist should review the final construction plans to confirm that the inadvertent discovery protocols are comprehensive. A professional archaeologist should provide a preconstruction orientation to the construction team to review the IDP protocols and procedures. This document is a valuable risk-management tool.

References Cited

Ames, Kenneth M., and Herbert D. G. Maschner
1999 *Peoples of the Northwest Coast: Their Archaeology and Prehistory*. Thames and Hudson, London, United Kingdom.

Anderson, Bern.
1939 The Vancouver Expedition: Peter Puget's Journal of the Exploration of the Puget Sound, May 7-June 11, 1792. *The Pacific Northwest Quarterly*, 30(2):177–217.

Angell, Tony and Kenneth C. Balcomb III
1982 *Marine Birds and Mammals of Puget Sound*. Puget Sound Books, Seattle, Washington.

Avey, Michael
ca. 1990 *Fluted Point Occurrences in Washington State*. Ms. on file at Pierce College, Steilacoom, Washington.

Barnosky, Cathy W.
1985 Late Quaternary Vegetation Near Battle Ground Lake, Southern Puget Trough, Washington. *Geological Society of America Bulletin* 96:263-71.

Boyd, Robert Thomas
1990 Demographic History, 1774-1874. In Northwest Coast, edited by Wayne Suttles, pp.135-148. *Handbook of North American Indians, Vol. 7*, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
1999 *The Coming of the Spirit of Pestilence*. UBC Press, Vancouver and Toronto and University of Washington Press, Seattle and London.

Bureau of Land Management (BLM)
2019 *Land Patents Database*. Electronic document, http://www.glorecords.blm.gov, accessed July 9, 2019.

Burtchard, Greg C.
2007 Holocene Subsistence and Settlement Patterns: Mount Rainier and the Montane Pacific Northwest. In *Archaeology in Washington* Vol. 13. Association for Washington Archaeology. Seattle.

Carlson, Roy L.
1990 Cultural Antecedents. In *Handbook of North American Indians: Northwest Coast, Volume 7,* edited by W. Suttles, pp. 60-69. Smithsonian Institution Press, Washington, D.C.

Carlson, Roy L. and Philip M. Hobler, eds.
2008 *Projectile Point Sequences in Northwestern North America.* Archaeology Press, Department of Archaeology, Simon Fraser University.

Carpenter, Cecilia S.
1986 *Fort Nisqually, A Documented History of Indian and British Interaction*. Tahoma Research Service, Tacoma, Washington.
2002 *The Nisqually, My People*. Heritage Quest Press, Orting, Washington.

Chatters, James C., Jason B. Cooper, and Phillippe D. LeTourneau
2011 *Understanding Olcott: Data Recovery at Sites 45N28 and 45N303, Snohomish County, Washington*. AMEC Earth & Environmental, Bothell, Washington.

Croes, Dale, Katherine M. Kelly, and Mark Collard.
2005 "Cultural historical context of Qwu? gwes (Puget Sound, USA): A preliminary investigation." *Journal of Wetland Archaeology* 5.1 (2005): 141-154.

Croes, Dale, Scott Williams, Larry Ross, Mark Collard, Carolyn Dennler, and Barbara Vargo
2008 The Projectile Point Sequences in the Puget Sound Region. In *Projectile Point Sequences in Northwestern North America*, edited by R. Carlson and M. Magne, pp. 105–130. Archaeology Press, Simon Fraser University, Burnaby, British Columbia.

Daugherty, Richard D.
1993 *DuPont Southwest, 45-PI-72*. National Register of Historic Places registration form on file at the Washington State Department of Archaeology and Historic Preservation, Olympia, Washington.

Easterbrook, Don J.
1993 *Surface Processes and Landforms*. MacMillan Publishing Company, New York.
2003 Cordilleran Ice Sheet Glaciation of the Puget Lowland and Columbia Plateau and Alpine Glaciation of the North Cascade Range, Washington. In *Western Cordillera and Adjacent Areas*, edited by T. W. Swanson, pp. 137-157. The Geological Society of America, Boulder, Colorado.

Franklin, Jerry F. and C.T. Dyrness
1988 Natural Vegetation of Oregon and Washington. *General Technical Report PNW-8*. U.S. Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland.

General Land Office (GLO)
1856 *Plat of Township 16 North, Range 1 East, Willamette Meridian*. Microfiche on file, USDI Bureau of Land Management, Oregon State Office, Portland.
1873 *Plat of Township 15 North, Range 1 East, Willamette Meridian*. Microfiche on file, USDI Bureau of Land Management, Oregon State Office, Portland.

Gunther, Erna
1945 Ethnobotany of Western Washington. *University of Washington Publications in Anthropology* 10 (1) University of Washington Press, Seattle, Washington.

Haeberlin, Hermann, and Erna Gunther
1930 *The Indians of Puget Sound*. University of Washington Publications in Anthropology 4(1).

Hajda, Yvonne
1990 Southwestern Coast Salish. In Northwest Coast, edited by Wayne Suttles, pp. 503-517. *Handbook of North American Indians*, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Heath, Joseph
1979 *Memoirs of Nisqually*. Ye Galleon Press, Fairfield, Washington.

Jermann, Jerry V.
1980 *The Hamilton Site (45-LE-172)*. Reports in Highway Archaeology 5. Office of Public Archaeology, Institute for Environmental Studies, University of Washington, Seattle.

Kidd, Robert S.
1964 *A Synthesis of Western Washington Prehistory from the Perspective of Three Occupation Sites*. Unpublished M.A. thesis, Department of Anthropology, University of Washington, Seattle.

Kopperl, Robert E.
2004 *Thurston County Roads Projects (CRP 61325, 61324, 61192, 61400, 61315).* Northwest Archaeological Associates Report prepared for Thurston County Roads and Transportation Services, Olympia, Washington.
2005 *Cultural Resource Assessment for the Yelm Highway Phase V Project (CRP 61192) Thurston County, Washington*. Northwest Archaeological Associates Report Number WA 05-01 prepared for Thurston County Roads and Transportation Services, Olympia, Washington.

Kopperl, Robert E., Charles Hodges, Alecia Spooner, Johonna Shea, and Christian Miss
2016 *Archaeology of King County, Washington: A Context Statement for Native American Archaeological Resources*. SWCA report 16-264. Submitted to the King County Historic Preservation Program, Seattle, Washington. On file, Washington Department of Archaeology and Historic Preservation, Olympia.

Kopperl, Robert E., Amanda K. Taylor, Christian J. Miss, Kenneth M. Ames, and Charles M. Hodges
2015 The Bear Creek Site (45KI839), a Late Pleistocene–Holocene Transition Occupation in the Puget Sound Lowland, King County, Washington. *PaleoAmerica* 1(1):116-120.

Kruckeberg, Arthur R.
1991 *The Natural History of Puget Sound Country*. University of Washington Press, Seattle, Washington.

Lane, Barbara
1975 *Anthropological Report on the Identity, Treaty Status and Fisheries of the Nisqually Tribe of Indians*. On file at Allen Library, University of Washington, Seattle.

Larrison, E. J.
1970 *Washington Mammals*. Seattle Audubon Society, Seattle, Washington.

Larrison, Earl J., and Klaus G. Sonnenberg
1968 *Washington Birds: Their Location and Identification*. Seattle Audubon Society, Seattle, Washington.

Leopold, Estella B., Rudy Nickmann, John I. Hedges, and John R. Ertel
1982 *Pollen and Lignin Records of Late Quaternary Vegetation, Lake Washington. Science* 218:1305-7.

Lewarch, D. E., Forsman, L. A., Kramer, S. K., Murphy, L. R., Larson, L. L., Iverson, D. R., and Dugas, A. E.
2002 *Data Recovery Excavations at the Bay Street Shell Midden (45KP115), Kitsap County, Washington*, Larson Anthropological/Archaeological Services, Gig Harbor, Limited Technical Report 2002-01.

Marino, Cesare
1990 History of Western Washington Since 1846. In Northwest Coast, edited by Wayne Suttles, pp. 169–179. *Handbook of North American Indians*, Vol. 7, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Meltzer, David J., and Robert C. Dunnell
1987 Fluted Points from the Pacific Northwest. *Current Research in the Pleistocene* 4:64-67.

Metsker Map Company
1962 *Metsker's Atlas of Thurston County, Washington*. Metsker Map Company, Seattle, Washington.

Nationwide Environmental Title Research (NETR)
1969 "*Olympia, Washington*". Electronic document, www.historicaerials.com, accessed December 9, 2019.

National Resource Conservation Service (NRCS)
2019 Web Soil Survey. Electronic resource, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed November 9, 2019.

Osborne, Douglas
1956 Evidence of Early Lithic in the Pacific Northwest. *Research Studies of the State College of Washington* 24:38–44.

Phillips, James W.
1971 *Washington State Place Names*. University of Washington Press.

Porter, Stephen C., and Terry W. Swanson
1998 Radiocarbon Age Constraints on Rates of Advance and Retreat of the Puget Lobe of the Cordilleran Ice Sheet During the Last Glaciation. *Quaternary Research* 50:205-213.

Schalk, Randall, Michael Kaschko and Brian Herbel
2001 *Archaeological Reconnaissance of the Skookumchuck Reservoir*. Cascadia Archaeology report prepared for the U.S. Army Corps of Engineers, Seattle.

Schasse, Henry W.
1987 *Geologic Map of the Centralia Quadrangle, Washington*. Open File Report 87-11. Washington Division of Geology and Earth Science, Department of Natural Resources, Olympia, Washington.

Shannon & Wilson
2019a *Critical Areas Report Yelm Highway Community Park Master Plan, Thurston Count, Washington*. Shannon & Wilson, Inc. report 103284-022 report prepared for Berger Partnership, Seattle, Washington.
2019b *Preliminary Geotechnical Engineering Evaluation, Yelm Highway Community Park, Olympa, Washington*. Shannon & Wilson, Inc. Letter report prepared for Thurston Count, Washington. Shannon & Wilson, Inc. report 103284-022 report prepared for Berger Partnership, Seattle, Washington.

Squaxin Island Tribe
2018 *Who We Are*. Electronic document accessed January 10, 2018, http://squaxinisland.org/government/who-we-are/

Smith, Marian W.
1940 *The Puyallup-Nisqually*. Columbia University Press. New York.

Smith, Carol and Mark Wenger
2001 *Salmon and Steelhead Habitat Limiting Factors Report for the Chehalis Basin and Nearby Drainages (WRIAs 22 and 23).* Washington State Conservation Commission, Olympia.

Stevenson, Shanna B.
1985 *Lacy, Olympia, and Tumwater, A Pictorial History*. Donning Company Publishers, Brookfield, MO.

Stein, Julie. K., and Phillips, Laura. S. (eds.)
2002 *Vashon Archaeology: A View from Burton Acres Shell Midden, Burke Museum of Natural History and Culture, Seattle, Research Report 8*.

Taylor, Amanda K.
2007 *The Vashon Island Archaeological Project*. Report prepared for King County Road Services Division.

Taylor, Jr., Herbert C.
1974 *Anthropological Investigation of the Chehalis Indians*. Garland Publishing, Inc.

Thurston County
2019 *Property Map*
https://map.co.thurston.wa.us/Html5Viewer/Index.html?viewer=Parcels.Main Electronic resource accessed December 12, 2019.

Tsukada, Matsuo, Shinya Sugita, and Dennis M. Hibbert
1981 Paleoecology in the Pacific Northwest I. *Late Quaternary Vegetation and Climate. Verhandlugen der Internationalen Vereingung fur Theoretische und Angewandte Limnologie* 21:730-737.

United States Geological Survey (USGS)
1936 *Geographic Names Information System*. Eld Inlet Decision Card 11668-3. https://geonames.usgs.gov/apex/f?p=gnispq:3:::NO::P3_FID:1513271 Electronic resources accessed January 12, 2018.

Washington State Digital Archives
2019 *Digital Archives* https://www.digitalarchives.wa.gov/ Electronic resource accessed December 12, 2019.

Waterman, T. T.
2001 *sdaʔdaʔ gʷeł dibeł lešucid ʔacacilt̓albixʷ (Puget Sound Geography)*. Vi Hilbert, Jay Miller, and Zalmai Zahir, contributing editors. Lushootseed Press, Federal Way, Washington.

Whitlock, Cathy
1992 Vegetational and Climatic History of the Pacific Northwest During the Last 20,000 Years: Implications for Understanding Present-Day Biodiversity. *The Northwest Environmental Journal* 8:5-28.

Appendix A:
Tabulated Summary of Shovel Probes

Summary of Shovel Probe Results

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
1	0-86	Dark brown fine silty sand with very few sub-rounded to rounded very small-small pebbles; few very fine roots; clear and wavy lower boundary.	O/A-horizon	-
	86-106	Yellowish Brown fine sand with no gravels or organics; terminated due to C-horizon.	Outwash / C-horizon	-
2	0-80	Very dark brown loamy sand with no gravels; rootlets to 50 cmbs; abrupt and smooth lower boundary.	O/A-horizon	-
	80-90	Yellowish brown silty sand with very few subangular large pebbles-small cobbles; terminated due to C-horizon.	Outwash / C-horizon	-
3	0-100	Dark brown sandy loam with very few sub-angular small pebbles; diffuse lower boundary; termination at desired depth.	O/A-horizon	-
4	0-72	Dark brown fine silty sand with very few sub-rounded to rounded very small-small pebbles; few very fine roots; clear lower boundary	O/A-horizon	-
	72-164	Yellowish brown fine sand with very few sub-rounded to rounded very small-small pebbles; terminated at desired depth.	Outwash / C-horizon	-
5	0-92	Very dark brown loamy sand with very few sub-angular to sub-rounded small-medium pebbles; rootlets to 40 cmbs; clear lower boundary	O/A-horizon	-
	92-100	Yellowish brown silty sand with few sub-angular small to very large pebbles; terminated at desired depth.	Outwash / C-horizon	-
6	0-96	Dark brown sandy loam with very few sub-angular small pebbles; diffuse lower boundary; termination at desired depth.	O/A-horizon	-
7	0-92	Dark brown fine silty sand with very few sub-rounded to rounded very small-small pebbles; few fine roots; clear lower boundary	O/A-horizon	-
	92-100	Yellowish brown fine sand with very few sub-rounded to rounded very small-small pebbles; terminated at desired depth.	Outwash / C-horizon	-
8	0-95	Very dark brown loamy fine sand with very few sub-rounded small-medium pebbles; rootlets top 5 cm; gradual lower boundary	O/A-horizon	-
	95-100	Brown fine sand with very few sub-rounded small pebbles; terminated at desired depth.	Glacial	-

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
9	0-55	Very dark brown loamy sand with very few sub-angular to sub-rounded small-medium pebbles; rootlets to 35 cmbs; gradual and smooth lower boundary	O/A-horizon	-
	55-85	Yellowish brown silty sand with few sub-angular medium-large pebbles; terminated due to outwash.	Outwash / C-horizon	-
10	0-82	Dark brown gravelly, silty fine sand with few sub-angular to sub-rounded very small pebbles-small cobbles; few fine roots; clear lower boundary	O/Ap-horizon	-
	82-101	Yellowish brown gravelly fine sand with few sub-angular to rounded very small-very large pebbles; terminated at desired depth.	Outwash / C-horizon	-
11	0-90	Very dark brown loamy fine sand with few small-medium pebbles; rootlets top 5 cm; gradual lower boundary.	O/A-horizon	
	90-95	Brown sand with few sub-rounded small-medium pebbles; termination due to depth	Outwash / C-horizon	
12	0-52	Dark brown sandy loam with predominant sub-angular large pebbles-small cobbles; clear lower boundary; termination due to surface of compact pebbles/cobbles.	O/A-horizon	-
13	0-83	Dark brown gravelly, silty fine sand with few sub-angular to rounded very small-large pebbles; few fine roots; clear lower boundary	O/Ap-horizon	-
	83-100	Yellowish brown gravelly fine sand with few sub-angular to rounded very small-large pebbles; terminated at desired depth.	Outwash / C-horizon	-
14	0-60	Very dark brown loamy sand with very few sub-angular small-medium pebbles; rootlets to 40 cmbs; abrupt and smooth lower boundary	O/A-horizon	-
	60-80	Dark yellowish-brown silty sand with few sub-angular to sub-rounded large pebbles-small cobbles; terminated due to C-horizon.	Outwash / C-horizon	-
15	0-46	Dark brown sandy loam with predominant sub-angular large pebbles-small cobbles; abrupt lower boundary.	O/A-horizon	-
	46-72	Dark brown sandy loam with many sub-angular large pebbles and small pebbles; abrupt lower boundary.	O/A-horizon	-
	72-77	Dark brown sandy loam with very few sub-angular medium pebbles.	O/A-horizon	-

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
16	0-83	Yellowish brown fine sand with few sub-rounded to rounded very small-medium pebbles.	O/A-horizon	-
	83-100	Yellowish brown fine sand with very few sub-rounded to rounded very small-medium pebbles	Outwash / C-horizon	
17	0-85	Very dark brown loamy fine sand with few sub-angular to sub-rounded small-medium pebbles; low plants	A-horizon	-
	85-95	Dark brown loamy sand with few sub-angular to sub-rounded small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
18	0-55	Very dark brown loamy sand with very few sub-angular small-medium pebbles; rootlets to 30 cmbs; clear and smooth lower boundary	O/A-horizon	-
	55-65	Yellowish brown silty sand with few sub-angular to sub-rounded medium-very large pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
19	0-72	Dark brown sandy loam with many sub-angular large pebbles; diffuse lower boundary; obstructed by rock.	O/A-horizon	-
20	0-56	Dark brown, gravelly, silty fine sand with few sub-rounded to rounded very small-medium pebbles; few fine roots; clear lower boundary	O/Ap-horizon	-
	56-79	Brown gravelly, fine sand with few sub-rounded to rounded very small-medium pebbles; clear lower boundary	B-horizon	-
	79-102	Yellowish brown gravelly fine sand with few sub-rounded to rounded very small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
21	0-80	Very dark brown loamy fine sand with very few sub-rounded small-medium pebbles; gradual lower boundary	O/A-horizon	-
	80-90	Brown fine sand with very few sub-rounded small pebbles; terminated at desired depth.	Outwash / C-horizon	-
22	0-50	Very dark brown loamy sand with no gravels; clear and smooth lower boundary.	O/A-horizon	-
	50-65	Yellowish brown silty sand with no gravels; terminated due to C-horizon.	Outwash / C-horizon	-
23	0-77	Dark brown sandy loam with few sub-angular medium pebbles; diffuse lower boundary.	O/A-horizon	-
24	0-93	Dark brown sandy loam with light brown sandy loam and few sub-angular small pebbles; abrupt lower boundary.	O/A-horizon	-

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
25	0-47	Dark brown silty fine sand with very few sub-angular to rounded very small-medium pebbles; few fine roots; clear lower boundary	O/Ap-horizon	-
	47-81	Brown fine sand with very few sub-angular to rounded very small-medium pebbles; clear lower boundary	Weak B-horizon	-
	81-105	Yellowish brown fine sand with very few sub-angular to rounded very small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
26	0-42	Very dark brown loamy sand with no gravels; clear and smooth lower boundary	O/A-horizon	-
	42-60	Yellow brown silty sand with no gravels; terminated due to C-horizon	Outwash / C-horizon	-
27	0-66	Dark brown silty fine sand with very few sub-rounded to rounded very small-medium pebbles; few fine roots; clear lower boundary	O/Ap-horizon	-
	66-100	Brown fine sand with very few sub-rounded to rounded very small-medium pebbles; terminated at desired depth.	Weak B-horizon	-
28	0-53	Dark brown silty fine sand with very few sub-rounded to rounded very small-medium pebbles; few fine roots; clear lower boundary	O/Ap-horizon	-
	53-78	Brown fine sand with very few sub-rounded to rounded very small-medium pebbles; abrupt lower boundary	Weak B-horizon	-
	78-100	Yellowish brown fine sand with very few sub-rounded to rounded very small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
29	0-50	Very dark brown loamy sand with very few gravels; gradual lower boundary	O/A-horizon	-
	50-70	Yellow brown sand with no gravels; terminated due to C-horizon.	Outwash / C-horizon	-
30	0-110	Dark brown sandy loam with few sub-angular medium pebbles; diffuse lower boundary; terminated at desired depth.	O/A-horizon	-
31	0-10	Brown silty sand with few sub-rounded small-medium pebbles; rootlets to 10 cmbs; gradual lower boundary	O/A-horizon	-
	10-113	Brown with very few small-medium pebbles; gradual lower boundary	B-horizon	--
	113-120	Light brown sand with very few small pebbles; terminated due to C-horizon.	Outwash / C-horizon	

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
32	0-18	Very dark brown loamy sand with predominant gravels; rootlets throughout; abrupt and smooth lower boundary	Fill	Modern trash (plastic) fragments
	18-50	Very dark brown loamy sand with common pebbles; abrupt, smooth lower boundary.	Native sediment with some intrusion from fill	-
	50-65	Yellow brown silty sand with few sub-rounded medium-large pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
33	0-52	Dark brown sandy loam with few sub-angular medium pebbles; abrupt lower boundary; obstructed by rock.	O/A-horizon	-
34	0-100	Dark brown sandy silt with few sub-rounded medium pebbles.	O/A-horizon	-
35	0-57	Dark brown silty fine sand with very few sub-angular to rounded very small-medium pebbles; few fine to small roots; clear lower boundary	O/Ap-horizon	-
	57-85	Brown fine sand with very few sub-rounded to rounded very small-medium pebbles; few fine to small roots; clear lower boundary	Weak B-horizon	-
	85-102	Yellowish brown fine sand with very few sub-rounded to rounded very small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
36	0-60	Very dark brown loamy sand with few sub-angular to sub-rounded very small-medium pebbles; clear and smooth lower boundary	O/A-horizon	-
	60-80	Yellow brown silty sand with very few sub-angular to sub-rounded small-medium pebbles; large root at 60-70 cmbs; terminated due to C-horizon	Outwash / C-horizon	-
37	0-41	Dark brown gravelly, silty, fine sand with few sub-rounded to rounded very small-medium pebbles; clear lower boundary	O\Ap-horizon	-
	41-81	Brown fine sand with very few sub-rounded to rounded very small-medium pebbles; clear lower boundary	Weak B-horizon	-
	81-100	Yellowish brown fine sand with very few sub-rounded to rounded very small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
38	0-75	Dark brown loamy sand with few small-medium pebbles; gradual lower boundary	A-horizon	-

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
	75-80	Light brown sand with common sub-rounded medium-large pebbles; terminated due to C-horizon.	Outwash / C-horizon.	-
39	0-60	Brown sandy loam with common sub-angular medium to large pebbles; diffuse lower boundary.	A-horizon	-
40	0-75	Brown sandy loam with common sub-angular medium-large pebbles; diffuse lower boundary	A-horizon	-
	75-80	Light brown sand with few sub-rounded small-medium pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
41	0-59	Dark brown silty fine sand with very few sub-rounded to rounded very small-medium pebbles; clear lower boundary	O/Ap-horizon	-
	59-82	Brown sand with very few sub-rounded to rounded very small-medium pebbles; clear lower boundary	Weak B-horizon	-
	82-105	Yellowish brown fine sand with very few sub-rounded to rounded very small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
42	0-75	Very dark brown loamy sand with very few sub-angular to sub-rounded small-medium pebbles; abrupt and smooth lower boundary	O/A-horizon	-
	75-90	Yellow brown silty sand with no gravels; terminated due to C-horizon	Outwash / C-horizon	-
43	0-85	Dark brown loamy sand with very few sub-rounded small pebbles; gradual lower boundary	A-horizon	-
	85-90	Light brown sand with very few sub-rounded small pebbles; terminated due to C-horizon.	Top of Outwash / C-horizon	-
44	0-45	Very dark brown silty sand with common sub-angular to sub-rounded	O/A-horizon/Disturbed	-
	45-65	Dark brown silty sand with few sub-angular to sub-rounded small-medium pebbles; few small roots throughout; abrupt and smooth lower boundary	B-horizon	-
	65-70	Yellowish brown silty sand with few sub-angular to sub-rounded small-medium pebbles; terminated due to C-horizon	Outwash / C-horizon	-
45	0-48	Dark brown gravelly, silty fine sand with few sub-rounded to rounded very small-medium pebbles; few fine roots; slightly compact; clear lower boundary	O/Ap-horizon	-

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
	48-86	Brown gravelly, fine sand with few sub-rounded to rounded very small-medium pebbles; few fine roots; clear lower boundary	Weak B-horizon	-
	86-102	Yellowish brown gravelly fine sand with few sub-rounded to rounded very small-medium pebbles; terminated at desired depth.	Outwash / C-horizon	-
46	0-42	Dark brown sandy loam with many sub-angular medium pebbles; abrupt lower boundary; obstructed by rock.	Fill/Disturbed	-
47	0-45	Very dark brown silty sand with common sub-angular to sub-rounded small-medium pebbles; few small roots throughout/obstructed by rock.	A-horizon	-
48	0-43	Dark brown silty fine sand with very few sub-rounded to rounded very small-medium pebbles; few fine roots; clear lower boundary	O/Ap-horizon	-
	43-75	Brown fine sand with very few sub-rounded to rounded very small-medium pebbles; few fine roots; clear lower boundary	Weak B-horizon	-
	75-91	Yellowish brown fine sand with very few sub-rounded to rounded very small-medium pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
49	0-40	Very dark brown loamy sand with very few sub-angular small-medium pebbles; clear and irregular lower boundary	O/A-horizon/Disturbed	-
	40-60	Yellow brown silty sand with few sub-angular small-very large pebbles; disturbed topsoil bleeds into layer; abrupt and wavy lower boundary	Outwash / C-horizon disturbed	50-60 cmbs (1) small shard aqua glass
	60-80	Light brown sand with many angular to sub-rounded very small-very large pebbles; terminated due to C-horizon	Outwash / C-horizon disturbed	-
50	0-46	Dark brown gravelly, silty fine sand with few sub-angular to rounded very small to large pebbles; few fine roots; diffuse lower boundary	O/Ap-horizon	-
	46-87	Dark brown gravelly, silty fine sand with few to common sub-angular to rounded very small pebbles-small cobbles; slightly compact; terminated due to depth.	Fill redeposited from other areas	-
51	0-90	Brown silty sand with tan sand lenses with common sub-rounded medium pebbles; terminated at desired depth.	Fill mix-lenses of sand	-

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
52	0-82	Brown sandy loam with few sub-angular medium pebbles; clear lower boundary.	O/A-horizon/Disturbed	-
53	-	Number not used.	-	-
54	0-65	Very dark brown silty medium-fine sand with very few subrounded, very small to small pebbles; common small roots; diffuse, smooth lower boundary.	A/B horizon	-
	65-100	Grayish-yellowish brown fine sand with very few subrounded very small to small pebbles.	Outwash / C-horizon	-
55	0-55	Dark brown medium sandy fine silt with very few sub-rounded very small to small pebbles; fine roots; gradual, broken lower boundary.	A-horizon	Few plastics throughout
	55-83	Brown silty find sand with very few very small to medium pebbles; clear lower boundary.	B-horizon	-
	83-100	Yellowish-brown fine sand with very few sub-rounded very small to small pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
56	0-40	Dark brown fine sandy silt with very few sub-rounded very small to small pebbles; gradual, smooth lower boundary.	A-horizon	-
	40-90	Brown silty fine sand with very few sub-rounded very small to small pebbles; gradual, smooth lower boundary.	B-horizon	-
	90-100	Yellowish-brown fine sand with very few sub-rounded very small to small pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
57	0-45	Very dark brown medium to fine sandy silt with very few sub-rounded very small to small pebbles; few rootlets; gradual, wavy lower boundary.	A-horizon	-
	45-75	Dark brown silty medium to fine sand with very few sub-rounded very small to small pebbles; gradual, smooth lower boundary.	B-horizon	-
	75-110	Yellowish brown fine sand with very few sub-rounded very small pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
58	0-65	Very dark brown medium to fine sandy silt wi9th very few sub-rounded very small to small pebbles; fine rootlets; gradual, smooth lower boundary.	A-horizon	55-65: sheet plastic and amber bottle glass shard

SP #	Depth (cmbs)	Sediment Characteristics	Horizon	Cultural Materials
	65-85	Dark brown silty medium to fine sand with very few sub-rounded very small to small pebbles; clear, smooth lower boundary.	B-horizon	-
	85-100	Yellowish-brown fine sand with very few sub-rounded very small to small pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
59	0-50	Very dark brown medium to fine sandy silt with very few sub-rounded very small to small pebbles; very fine rootlets; loose; gradual, smooth lower boundary.	A-horizon	-
	50-85	Dark brown silty medium to fine sand with very few sub-rounded very small to small pebbles; clear, smooth lower boundary.	B-horizon	-
	85-100	Yellowish brown medium sand with very few sub-rounded very small to medium pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
60	0-90	Very dark brown silty medium to fine sand with very few sub-angular to sub-rounded very small to medium pebbles; fine to small roots throughout; diffuse, smooth lower boundary.	A/B-mixed horizon	Modern and possible historic debris throughout (flat glass, plastics)
	90-100	Yellowish brown fine sand with very few sub-angular to sub-rounded very small to small pebbles; terminated due to C-horizon.	Outwash / C-horizon	-
61	0-60	Very dark brown silty medium to fine sand with very few sub-rounded very small pebbles; very fine roots, decaying organics and charcoal flecks throughout; pockets of C-horizon from rodent burrows; terminated due to water intrusion.	A-horizon	-
62	0-40	Very dark brown medium to fine sandy silt with very few sub-rounded very small to small pebbles; clear, smooth lower boundary.	A-horizon	-
	40-55	Dark brown silty medium to fine sand with very few sub-rounded very small to small pebbles; terminated due to water intrusion.	B-horizon	-
63	0-65	Very dark brown silty medium to fine sand with very few sub-rounded very small pebbles; common charcoal flecks and chunks throughout; some bioturbation; terminated due to water intrusion.	A/B-mixed horizon	-

F.

Traffic Analysis

YELM HIGHWAY COMMUNITY PARK
TRIP GENERATION MEMO

1. Introduction

The main goals of this study focus on the assessment of the trip generation for the proposed Yelm Highway Community Park and High School. A project description is provided below.

2. Project Description

Yelm Highway Community Park proposes a community park on approximately 60-acres located in unincorporated Thurston County. Additionally proposed and comprising approximately 20-acres on the northwest portion of the site is a planned high school accommodating up to 1400 students. The subject property is located south of Yelm Highway SE and within tax parcel #'s: 0933000-8002; 5000; & -5001. Access by way of Hampton Street SE, Yelm Highway SE opposite Landview Drive SE (right-in/right-out) and Wiggins Road SE is proposed for school & park ingress and egress. The community park will allow for many outdoor activities, including basketball and pickleball courts, soccer fields, playgrounds, a skate park, dog park, bike skills area, a spray ground, community garden, restrooms, and a picnic area.

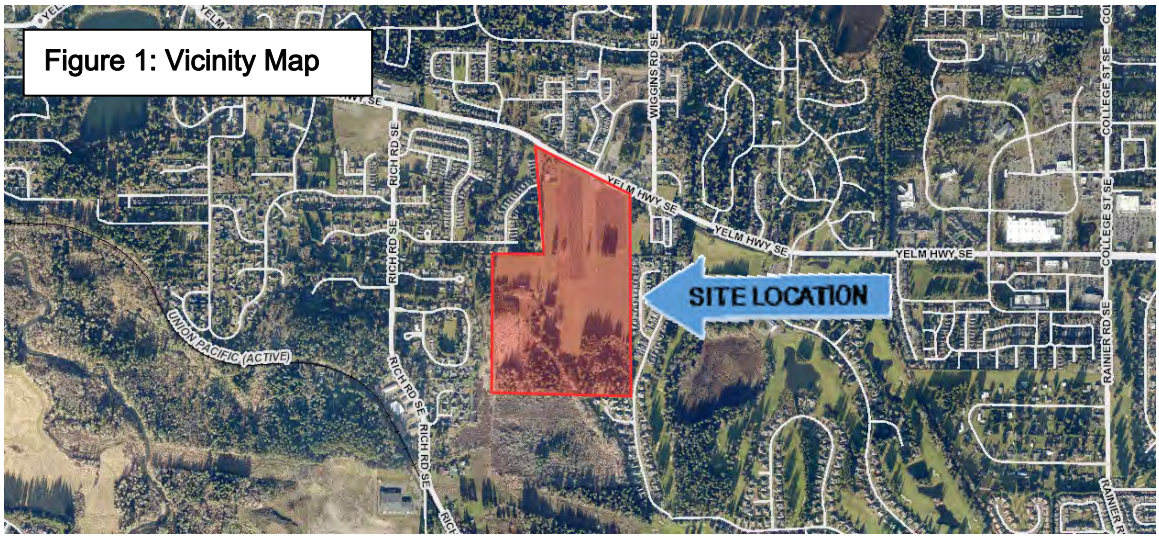


Figure 1: Vicinity Map

3. Data Collection

To establish estimated trips associated with the proposed Yelm Highway Community Park, three existing community parks were surveyed that were located in Thurston County and offering similar amenities. The parks that were surveyed are Regional Athletic Complex, Rainier Vista Community Park, and Yauger Park. All three parks were analyzed during the weekday AM peak hour, PM peak hour, and the weekend peak hour.

Cameras were deployed at each respective park's entrance(s) to record all inbound and outbound activity. The variable "acres" was used to develop a trip rate metric to apply to Yelm Highway Community Park. It should also be noted that counts were administered in July of 2021 which would be representative of peak season conditions. With nice weather and sporting events, summers typically receive higher volumes of visitors when compared to winter or times of inclement weather. Therefore, the counts provided herein should be considered as "peak season" projections.

Cameras were deployed and captured peak periods between the weekday periods of 6:00-9:00 AM and 4:00-6:00 PM. Counts were again recorded during the weekend between 12:00-4:00 PM. The one-hour reflecting the highest observed total inbound and outbound movements was then used for calculations and is considered the "peak hour." Park descriptions are listed below along with an aerial image of each park.

A. *Name*: Regional Athletic Complex
Address: 8345 Steilacoom Road SE, Olympia, WA
Facility Type: 138.42-acre park
Parcel Number(s): 11814410300, 11814410200
Date(s) Sampled: 7/28/21 (PM), 7/29/21 (AM), 7/31/21 (Weekend)
Points of Access: 2
Existing Amenities: 6 soccer fields, 5 baseball fields, 3 half-court basketball courts, and a playground.
Weather: 7/28/21 & 7/29/21 – Sunny, no clouds; 7/31/21 – Cloudy

Figure 2: Regional Athletic Complex

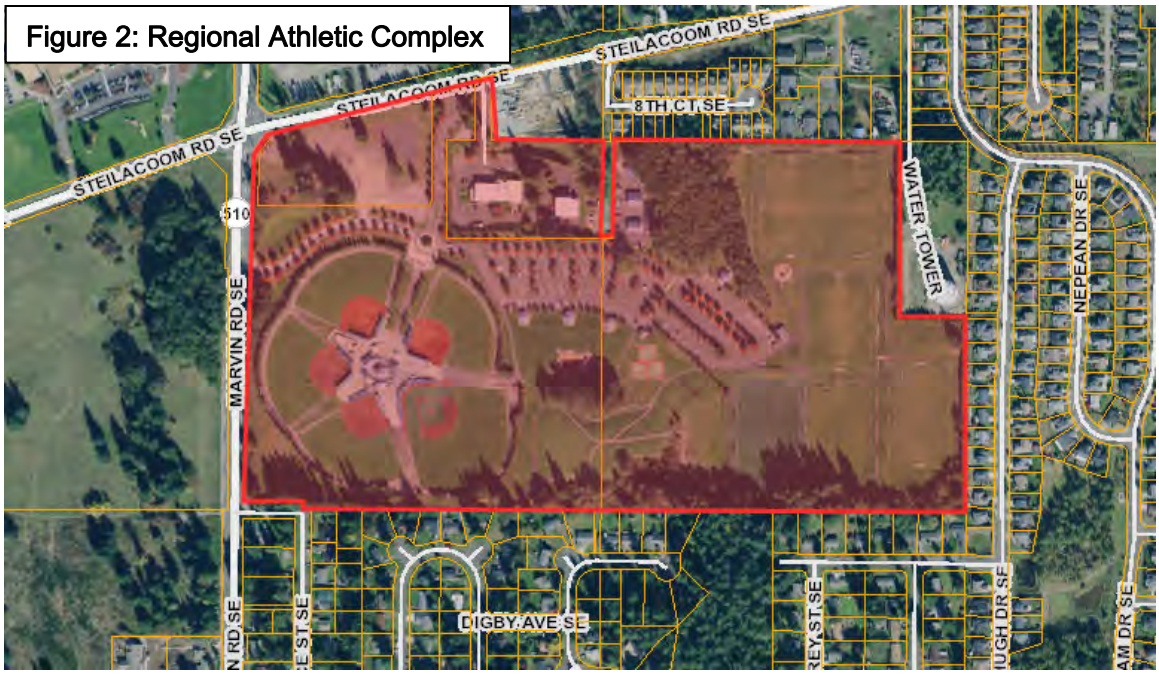


Table 1: Regional Athletic Complex Trip Summary

Park	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Weekend Peak Hour Trips
Regional Athletic Complex 138.4-acres	170	169	301
Trips Per Acre	**1.23**	**1.22**	**2.17**

B. *Name*: Rainier Vista Community Park
Address: 5475 45th Avenue SE, Lacey, WA
Facility Type: 46.4-acre community park
Parcel Number(s): 11833240000, 11833130100, 11833130300
Date(s) Sampled: 7/28/21 (PM), 7/29/21 (AM), 7/31/21 (Weekend)
Points of Access: 2
Existing Amenities: 3 baseball fields, 4 tennis courts, 4 pickleball courts, 2 basketball half-courts, volleyball courts, a skate park, a playground, soccer fields, and a walking path.
Weather: 7/28721 & 7/29/21 – Sunny, no clouds; 7/31/21 – Cloudy

Figure 3: Rainier Vista Community Park

Table 2: Rainier Vista Community Park Trip Summary

Park	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Weekend Peak Hour Trips
Regional Athletic Complex 46.4-acres	72	157	98
Trips Per Acre	**1.55**	**3.38**	**2.11**

C. *Name*: Yauger Park

Address: 3100 Capital Mall Dr SW, Olympia, WA

Facility Type: Approximately 40-acre community park

Parcel Number(s): 12816310300

Date(s) Sampled: 7/28/21 (PM), 7/29/21 (AM), 7/31/21 (Weekend)

Points of Access: 2

Existing Amenities: 4 baseball fields, a playground, horseshoe pits, community gardens, a skate park, and walking trails.

Weather: 7/28721 & 7/29/21 – Sunny, no clouds; 7/31/21 – Cloudy

Figure 4: Yauger Park

Table 3: Yauger Park Trip Summary

Park	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Weekend Peak Hour Trips
Regional Athletic Complex ~40-acres	20	41	54
Trips Per Acre	**0.50**	**1.03**	**1.36**

4. Trip Generation Summary

Peak Hour Trip Summary

Table 4: Trip Rate Summary

Park	Weekday AM Peak Hour Trip Rate	Weekday PM Peak Hour Trip Rate	Weekend Peak Hour Trip Rate
Regional Athletic Complex	1.23	1.22	2.17
Rainier Vista Community Park	1.55	3.38	2.11
Yauger Park	0.50	1.03	1.36
Average	**1.09**	**1.88**	**1.88**

Based on the surveyed sites, the following trip rates were identified:

Weekday AM Peak Hour: 1.09 trips/acre

Weekday PM Peak Hour: 1.88 trips/acre

Weekend Peak Hour: 1.88 trips/acre

Also, in recognition that Yelm Highway Community Park is proposed to offer amenities not available at the study sites that could attract additional visitors, additional counts were taken. Amenities such as the spray park and dog park were evaluated in terms of trip generation characteristics. It should be noted, however, that a single trip could likely utilize a combination of all on-site uses (e.g., visitors to the playground may also use the spray park, parents watching a sporting event may use dog park, etc.).

Spray Park:
Kiwanis Spray Park, located at 322 S Meridian in the city of Puyallup, is a comparable facility to that of the proposed spray park at Yelm Highway Community Park in that they are both located within a public park and are close in size. Field observations occurred in August of 2021 which would represent peak conditions for this type of use as spray parks are typically opened for approximately 100 days of the year due to weather. Both a weekday and weekend sample took place with the following trips.

Saturday August 28, 2021: Peak Hour Trips = 9
Tuesday August 31, 2021: Peak Hour Trips = 6

These trips will be applied to the overall trip forecasts to account for the spray park activity.

Dog Park:

A combination of historic inhouse data that sampled three dog parks in 2009 as well as two additional dog parks in September of 2021 were used for the proposed dog park component. In review of the proposed site plan, the dog park area is approximately 2/3 of an acre. Shown below is an excerpt from a 2010 traffic study which included a dog park trip analysis.

DOG PARK TRIPS

Location:	Fort Steilacoom	Genesee Park	Grandview Park
Off-Leash Area:	22 Acres	2.5 Acres	37 Acres
Other Uses in Park:	4 baseball fields, 6 soccer fields, playground, picnic area, trails	2 soccer fields, trails, playground	None
Weather:	Overcast, 45 deg	Overcast, 45 deg	Overcast, 45 deg
Surrounding Development:	moderate density SF to E	moderate density SF surrounding entire park	Multifamily and high density SF to E & W

11/14/2009

Saturday Dog Park Trips:	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
1:00 PM	12	12	6	3	11	10
1:15 PM	6	6	6	5	6	4
1:30 PM	13	9	7	7	4	8
1:45 PM	11	15	9	6	10	8
2:00 PM	5	9	6	8	6	5
2:15 PM	9	8	7	10	6	3
2:30 PM	6	6	8	7	5	3
2:45 PM	8	9	7	9	4	11
Peak Hour Trips:						
Inbound:	42		28		31	
Outbound:	42		34		30	

The above counts represent weekend data. For weekday estimates, two additional dog parks were sampled in September of 2021 between 4:00-6:00 PM. The first location, Clarks Creek Dog Park, is a 2/3 acre off-leash dog park in city of Puyallup. The second location, Enumclaw Dog Park, is a 2-acre off-leash dog park. Summarized below is a trip generation summary for each.

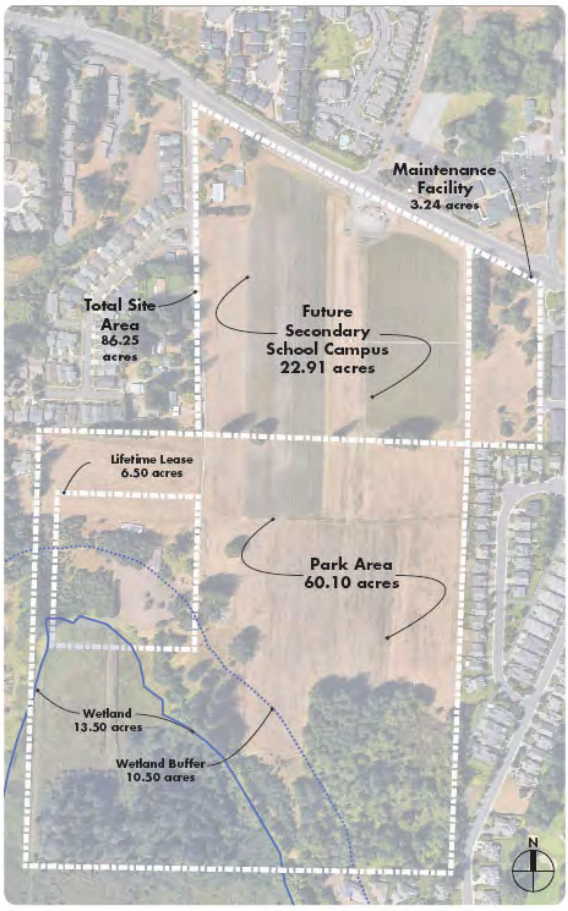
Table 5: Dog Park Trip Rates

Time Period	Location	Peak Hour Trips	Acres	Trips/Acre
Weekend Peak	Fort Steilacoom	84	22	3.82
	Genesee Park	62	2.5	24.8
	Grandview Park	61	37	1.65
			Average:	**10.1**
Weekday Peak	Enumclaw	15	2	7.5
	Clarks Creek	8	0.67	12.0
			Average:	**9.5**

Based on the provided site plan, the dog park is estimated at 2/3 of an acre. Using the above rates, the weekend peak hour is expected to generate 7 trips and the weekday peak hour is expected to generate 6 trips.

5. Project Trip Summary

Shown below is a map of the subject site and developable area. Of the 86.25 acres, approximately 22.91 acres would be designated for a future secondary school. Including wetlands, the remaining site area is approximately 63.34 acres. However, a portion of this area is wetlands and wetlands buffer and is restricted to potential development. In addition, area for the spray park and dog park are already accounted for in an independent calculation. To remain conservative is analysis, 60 acres is applied to the trip forecasts.



TOTAL SITE AREA: 86.25 ACRES

SCHOOL CAMPUS	22.91 ACRES
MAINTENANCE FACILITY	3.24 ACRES
PARK AREA	60.10 ACRES

PARK AREA: 60.10 ACRES

WETLAND	13.50 ACRES
WETLAND BUFFER	10.50 ACRES
LIFETIME LEASE	6.50 ACRES

DEVELOPABLE AREA
(for intensive/active park uses)
29.60 ACRES

Table 6: Yelm Highway Community Park Summary

Proposed Use	Size	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Weekend Peak Hour Trips
Community Park	~60-acres	65	113	113
Spray Park	0.25-acre	0	6	9
Dog Park	0.67-acre	0	6	7
	Total	**65**	**125**	**129**

6. Conclusion

To estimate vehicular activity associated with the proposed Yelm Highway Community Park, three existing community parks (Regional Athletic Complex, Lacey; Rainier Vista Community Park, Lacey; & Yauger Park, Olympia) were sampled in terms of vehicular activity during the weekday AM peak period, weekday PM peak period, and weekend peak period. In addition, as uses such as the proposed spray park and dog park, were not included in the sample sites, additional surveys were administered to estimate their respective activity levels.

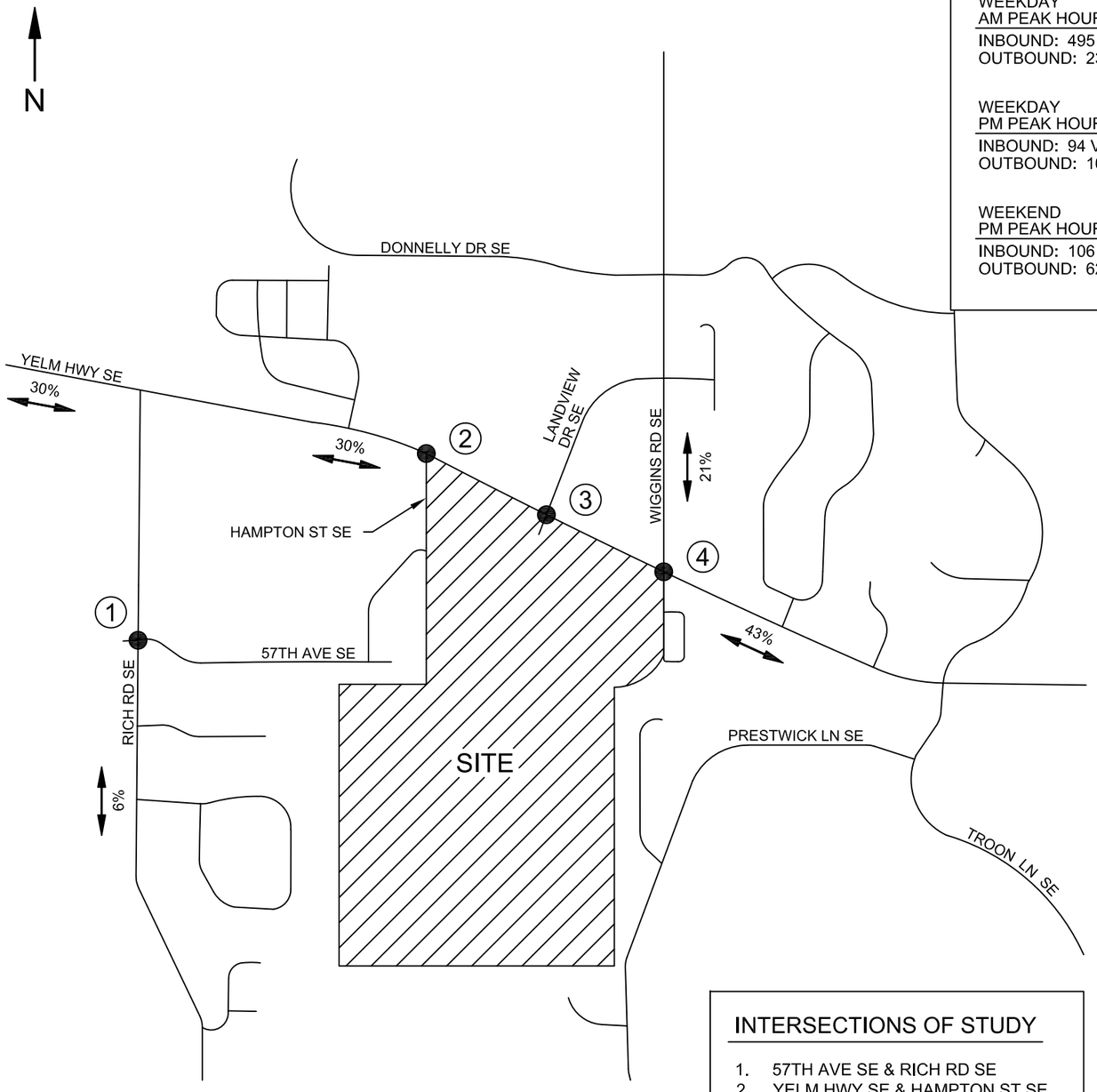
Shown in the table below is the total estimated trips for the proposed community park in addition to a 1400-student high school. The high school trip rates are based on ITE's *Trip Generation Manual,* 11th Edition.

Table 7: Project Trip Generation Summary

Phase	Proposed Use	Size	Weekday AM Peak Hour Trips (7:00-9:00 AM)			Weekday PM Peak Hour Trips (4:00-6:00 PM)			Weekend Peak Hour Trips (12:00-4:00 PM)		
			In	Out	Total	In	Out	Total	In	Out	Total
1	*Community Park: ~30% Build-out*	*~20-acres*	*15*	*7*	***22***	*30*	*12*	***42***	*20*	*22*	***42***
2	Community Park: *Full Build-out*	~60-acres	46	19	**65**	90	35	**125**	59	67	**126**
3	High School	1400 students	495	233	**728**	94	102	**196**	106	62	**168**
	Total Site Trips: Phases 2+3		541	252	**793**	184	137	**321**	165	129	**294**

As illustrated, full build-out of the community park (Phases 1-2) is anticipated to generate 65 weekday AM, 125 weekday PM and 126 weekend PM peak hour trips. As Phase 1 development is to comprise an approximate 30% build-out of the community park land use, these values can be reduced to trip ends 1/3 the size of full Phase 1-2 build-out. This yields 22 weekday AM, 42 weekday PM and 42 weekend PM peak hour trips. Finally, with full build-out of Phase 3 including a 1,400-student high school, the proposed development is anticipated to generate 793 weekday AM, 321 weekday PM and 294 weekend PM peak hour trips.

Trip distribution for full build-out of the on-site 1400-student high school is illustrated in Figure A. Figure B illustrates full build-out of the on-site community park. Figure C depicts full build-out of all on-site uses. It should be noted that the Landview Drive SE access is proposed to be restricted to right-in, right-out turning movements. Moreover, the Hampton Street SE access is proposed to be the primary school-related access while the Wiggins Road SE is anticipated to accommodate the majority of park-related traffic. Lastly, it should be noted that school buses associated with the proposed on-site high school will utilize the Wiggins Road SE access for site ingress and egress.



WEEKDAY
AM PEAK HOUR TRIPS
INBOUND: 495 VPH
OUTBOUND: 233 VPH

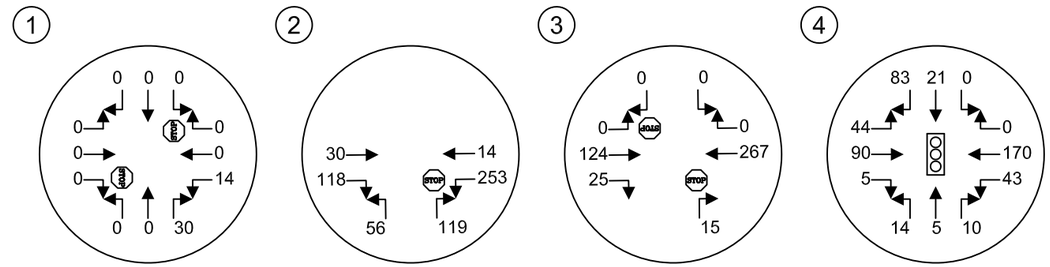
WEEKDAY
PM PEAK HOUR TRIPS
INBOUND: 94 VPH
OUTBOUND: 102 VPH

WEEKEND
PM PEAK HOUR TRIPS
INBOUND: 106 VPH
OUTBOUND: 62 VPH

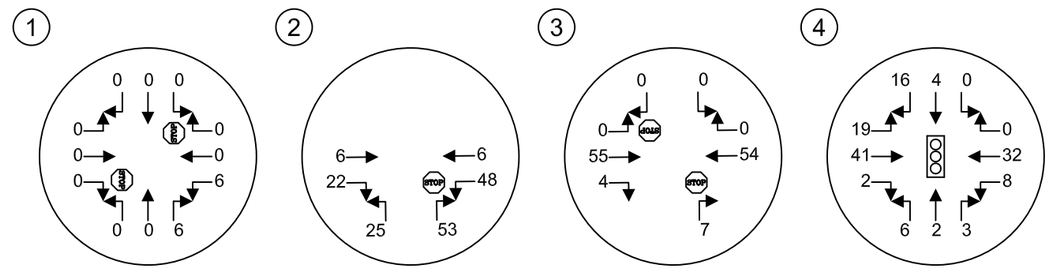
INTERSECTIONS OF STUDY

1. 57TH AVE SE & RICH RD SE
2. YELM HWY SE & HAMPTON ST SE
3. YELM HWY SE & LANDVIEW DR SE
4. YELM HWY SE & WIGGINS RD SE

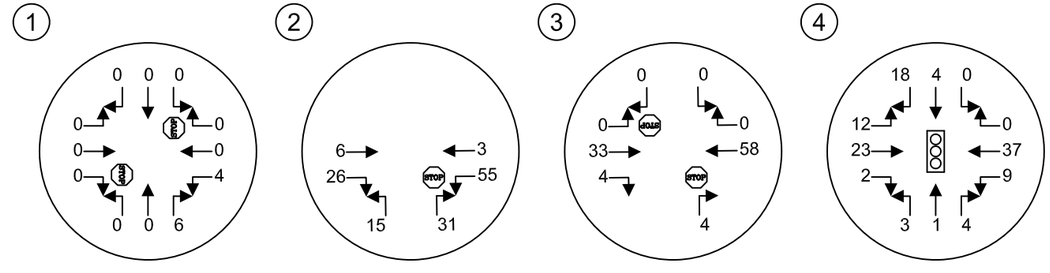
WEEKDAY AM PEAK HOUR VOLUMES



WEEKDAY PM PEAK HOUR VOLUMES



WEEKEND PM PEAK HOUR VOLUMES

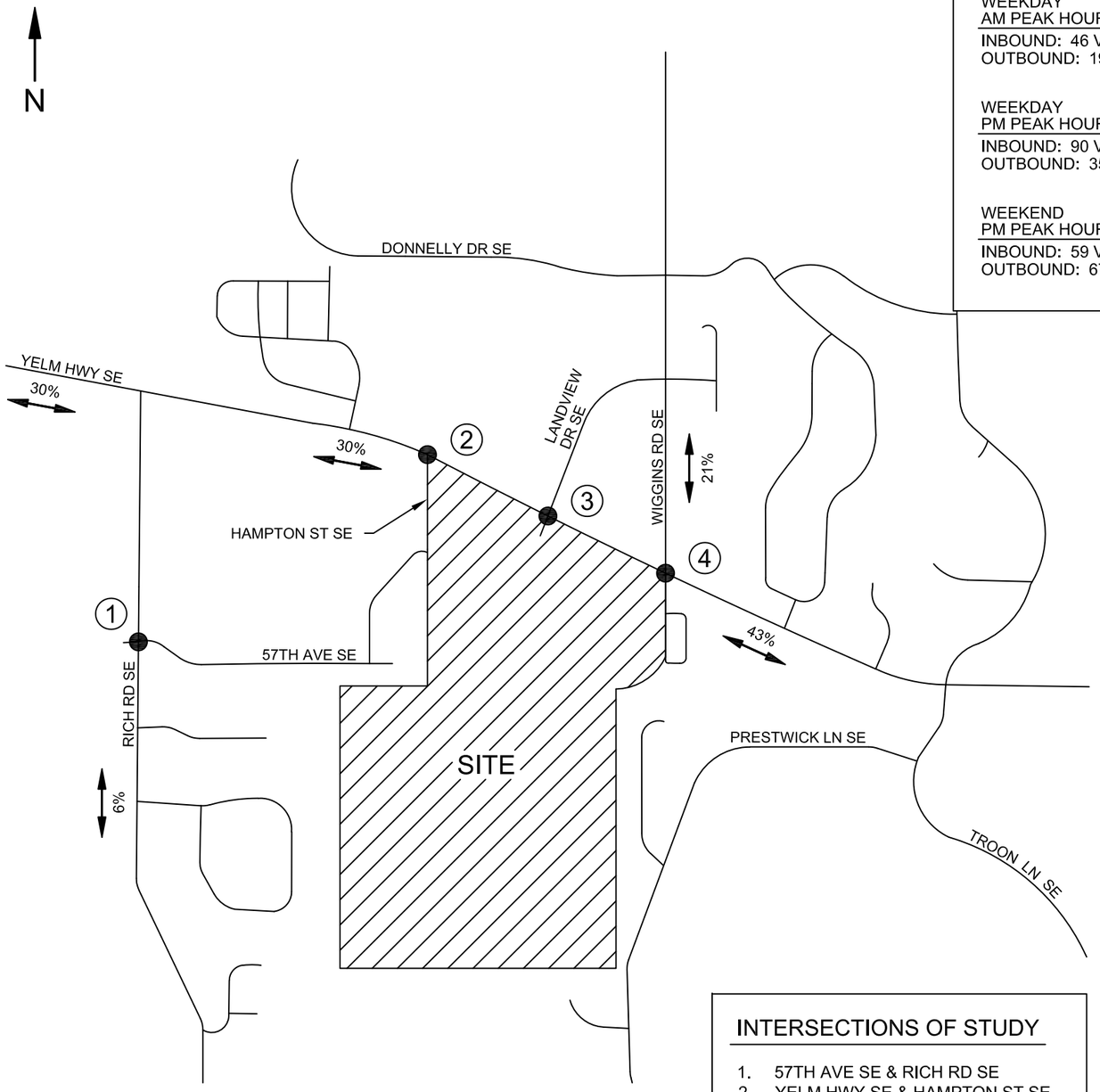


HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

YELM HIGHWAY COMMUNITY PARK

HIGH SCHOOL PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT: FULL BUILD-OUT
FIGURE A

PO Box 397 Puyallup, WA 98371
(253) 770 1401 heathtraffic.com



WEEKDAY
AM PEAK HOUR TRIPS
INBOUND: 46 VPH
OUTBOUND: 19 VPH

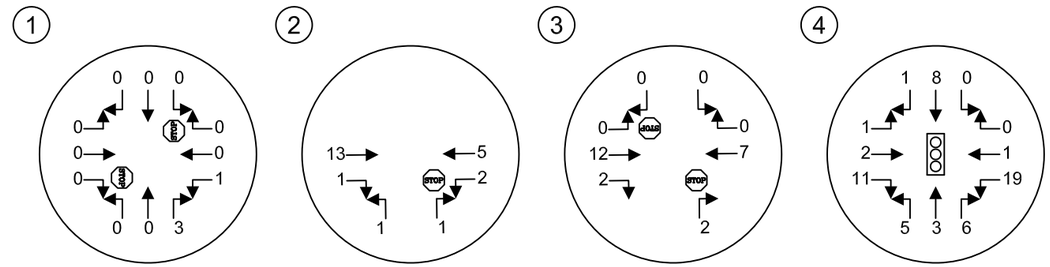
WEEKDAY
PM PEAK HOUR TRIPS
INBOUND: 90 VPH
OUTBOUND: 35 VPH

WEEKEND
PM PEAK HOUR TRIPS
INBOUND: 59 VPH
OUTBOUND: 67 VPH

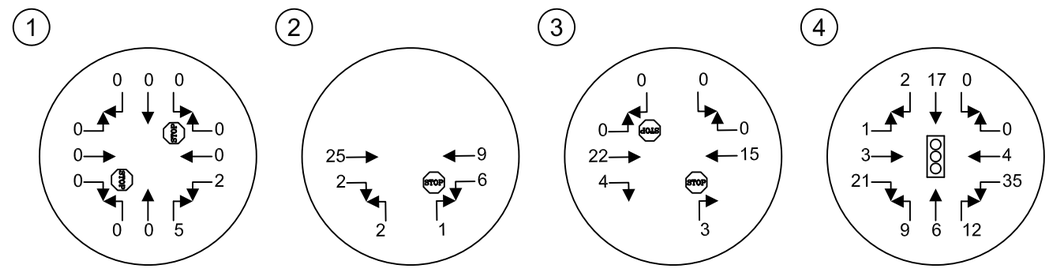
INTERSECTIONS OF STUDY

1. 57TH AVE SE & RICH RD SE
2. YELM HWY SE & HAMPTON ST SE
3. YELM HWY SE & LANDVIEW DR SE
4. YELM HWY SE & WIGGINS RD SE

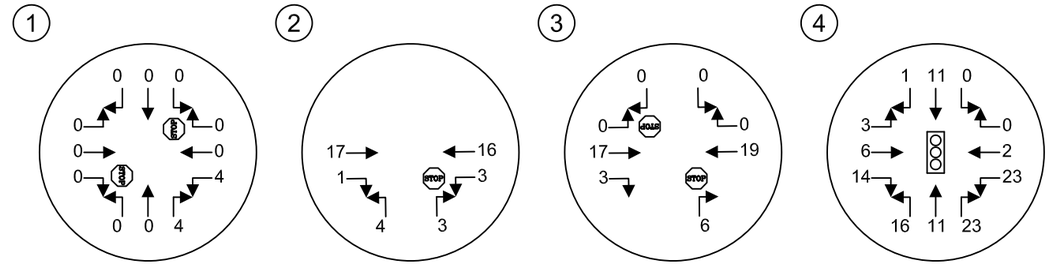
WEEKDAY AM PEAK HOUR VOLUMES



WEEKDAY PM PEAK HOUR VOLUMES



WEEKEND PM PEAK HOUR VOLUMES

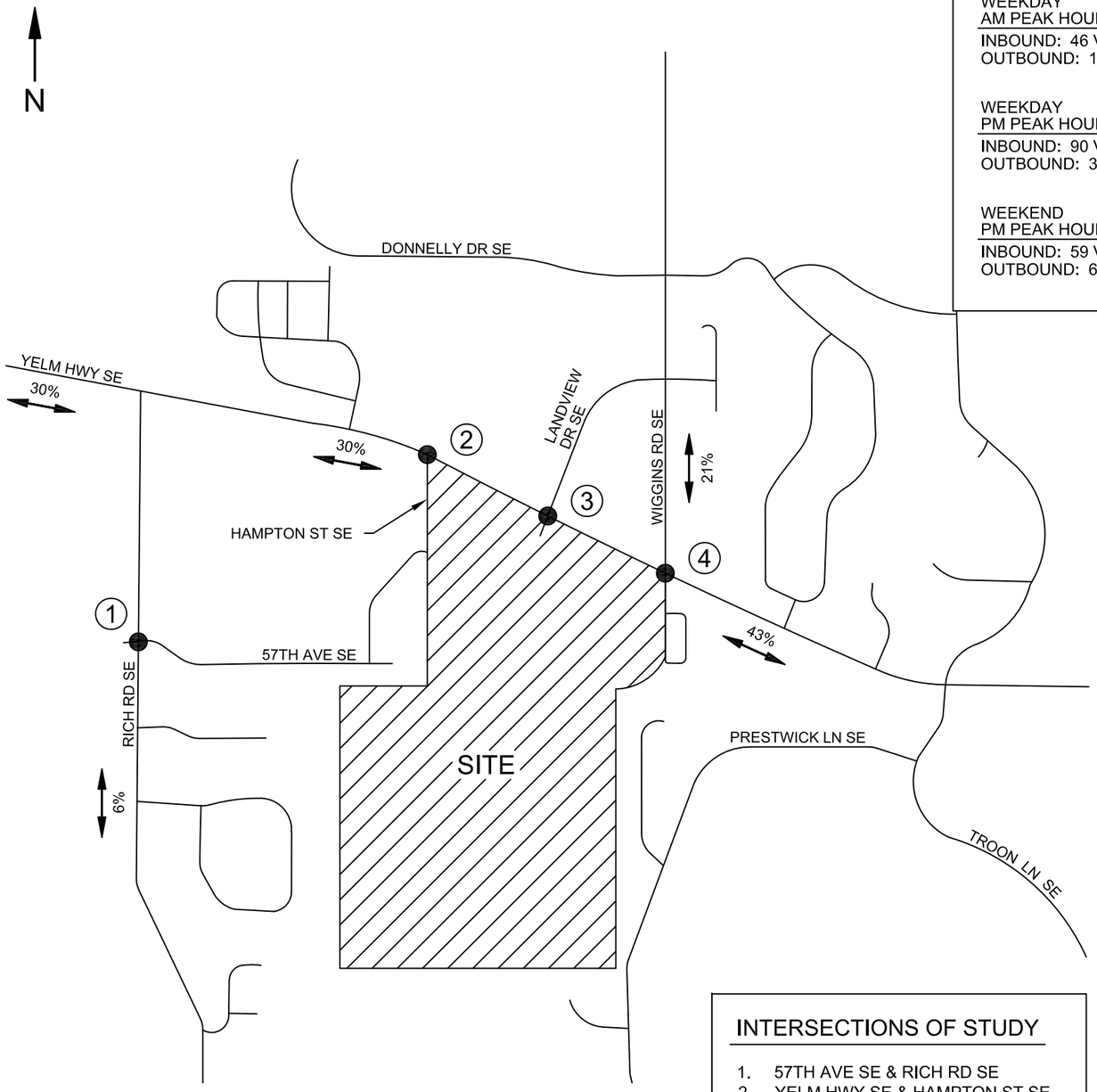


HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

YELM HIGHWAY COMMUNITY PARK

COMMUNITY PARK PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT: FULL BUILD-OUT
FIGURE B

PO Box 397 Puyallup, WA 98371
(253) 770 1401 heathtraffic.com



WEEKDAY
AM PEAK HOUR TRIPS
INBOUND: 46 VPH
OUTBOUND: 19 VPH

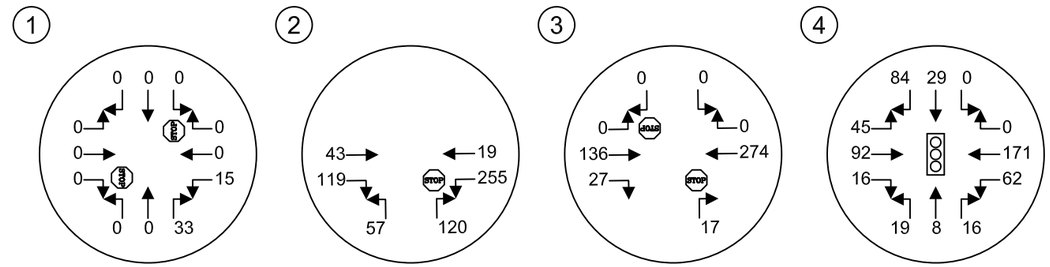
WEEKDAY
PM PEAK HOUR TRIPS
INBOUND: 90 VPH
OUTBOUND: 35 VPH

WEEKEND
PM PEAK HOUR TRIPS
INBOUND: 59 VPH
OUTBOUND: 67 VPH

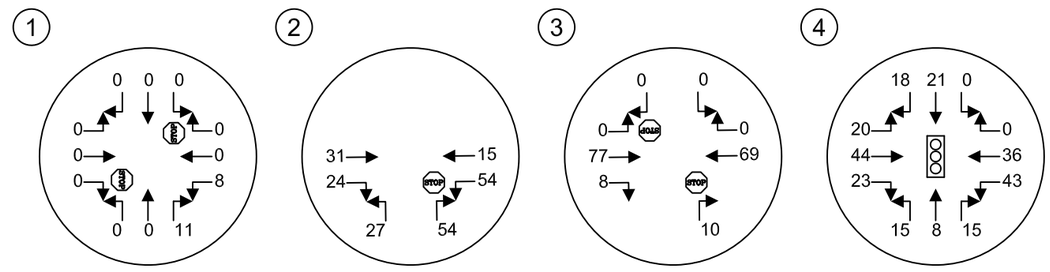
INTERSECTIONS OF STUDY

1. 57TH AVE SE & RICH RD SE
2. YELM HWY SE & HAMPTON ST SE
3. YELM HWY SE & LANDVIEW DR SE
4. YELM HWY SE & WIGGINS RD SE

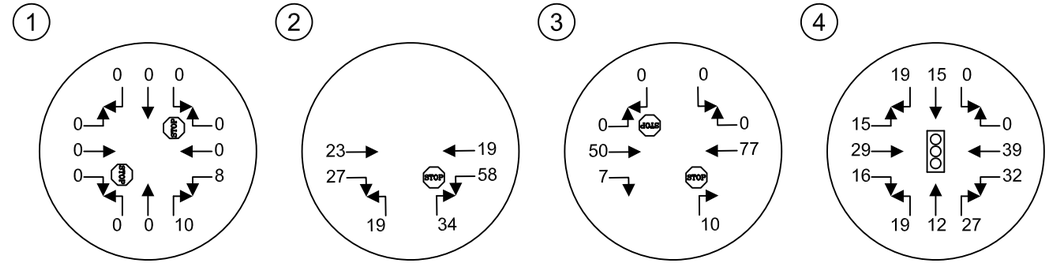
WEEKDAY AM PEAK HOUR VOLUMES



WEEKDAY PM PEAK HOUR VOLUMES



WEEKEND PM PEAK HOUR VOLUMES



HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

YELM HIGHWAY COMMUNITY PARK

PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT: FULL SITE BUILD-OUT
FIGURE C

PO Box 397 Puyallup, WA 98371
(253) 770 1401 heathtraffic.com

G. Proposed Partnership with Olympia School District for Secondary School Colocation

Details Reports

File #:	22-0276 Version: 1		
Type:	decision	Status:	Passed
File created:	3/14/2022	In control:	City Council
Agenda date:	3/22/2022	Final action:	3/22/2022
Title:	Proposed Partnership with Olympia School District for a Secondary School Colocation at the Future Yelm Highway Community Park		
Attachments:	1. Olympia School District Letter, 2. Engage Olympia Project Webpage		

History (1) Staff Report

Title
Proposed Partnership with Olympia School District for a Secondary School Colocation at the Future Yelm Highway Community Park

Recommended Action
Committee Recommendation:
On January 21, 2021, the Parks and Recreation Advisory Committee voted (4-3) to not recommend continuing to explore a partnership with Olympia School District to locate a secondary school at the Yelm Highway Community Park site based on eight concerns presented by Parks and Recreation Advisory Committee (PRAC) subcommittee members.

On December 2, 2021, the Parks and Recreation Advisory Committee voted (7-1) to not recommend colocation with a school at the Yelm Highway Community Park site.

City Manager Recommendation:
Move to authorize negotiation of the necessary agreements needed to execute a partnership with Olympia School District to locate a secondary school at the Yelm Highway Community Park property based on the proposed terms.

Report
Issue:
Whether to enter into a partnership with Olympia School District to locate a secondary school at the Yelm Highway Community Park.

Staff Contact:
Paul Simmons, Parks, Arts and Recreation Director, 360.753.8462
Laura Keehan, Parks Planning & Design Manager, 360.570.5855

Presenter(s):
Jay Burney, City Manager
Paul Simmons, Parks, Arts and Recreation Director
Laura Keehan, Parks Planning & Design Manager

Background and Analysis:
In late 2018, Olympia Parks, Arts and Recreation Department (OPARD) finalized the purchase of 83 acres located at 3323 Yelm Highway for a future community park to support the development of four rectangular fields and many other complimentary amenities. The property is located next to a previously purchased 3.54-acre park parcel also on Yelm Highway.

The Yelm Highway Park Master Planning project was delayed in March 2020 due to the COVID-19 pandemic. Shortly thereafter, OPARD was approached by Olympia School District ("the School District") with a request to consider allowing the School District to utilize a 22.91-acre portion of the park site for a future secondary school to be constructed in ten years or more. The School District would either purchase the property outright or trade an as-yet-to-be-identified parcel for the 22.91-acres.

In a joint public meeting on November 16, 2020, OPARD and the School District described the concept and answered questions from the community. Following that meeting an online public survey was posted to the project's Engage Olympia webpage and was open through December 6, 2020. The Parks and Recreation Advisory Committee (PRAC) held a special meeting on December 17, 2020, to review the survey results. PRAC designated a subcommittee to study the co-location proposal. At PRAC's January 21, 2021, meeting they discussed eight concerns associated with the proposed co-location of a secondary school at the park site. A motion passed (4-3) to not recommend continuing to explore a partnership with Olympia School District to locate a secondary school at the Yelm Highway Community Park site based on the eight concerns presented by the PRAC subcommittee.

Based on familiarity with the site, Berger Partnership was hired directly by the School District to perform an analysis of the eight concerns raised by PRAC. The School District and Berger Partnership prepared a response to PRAC's concerns and presented the information to PRAC at a special meeting held on December 2, 2021. PRAC voted (7-1) to not recommend to Council that a secondary school be co-located at the Yelm Highway Community Park site.

At a Council Study Session on February 8, 2022, the City Council received additional information from the School District, Berger Partnership, and PRAC Chair Maria Ruth. The Council's discussion continued during the Council's regular meeting on the same night. Further information and discussion on the topic occurred by Council at their March 1, 2022, regular meeting. At this meeting City staff presented pros and cons of a potential partnership with the Olympia School District, student population growth projections for Southeast Olympia, and a presentation showing the other parcels of land in Olympia that could accommodate a high school.

Following that meeting, the City received an official partnership proposal (below) from Olympia School District that outlines the terms of their proposed partnership. These terms include real estate transactions and property exchanges, a proposal outlining shared development costs at Yelm Highway (including an expanded auxiliary gym for City recreation purposes), and proposed enhancements and expansions of the current Joint Use Agreement. The current Joint Use Agreement has been in place for decades and stipulates the terms of how the City and the School District coordinate shared use and maintenance of share facilities and fields.

Olympia School District's Proposed Terms for a Yelm-Highway Co-Location Agreement

Real Estate Transaction

- District purchases 22.91 (more or less) acres of Yelm Highway property via transfer of 27-acre property on Harrison (Westside) to City. District also seeks and purchases an alternative site for a fire station in the Yelm Highway area.
    - Values of these three properties equalized as necessary to meet public entity for fund requirements once appraisals are complete.

- The District gives the City a one-time option to purchase the downtown East parcel of land adjacent to the Knox building, beginning July 1, 2022 through July 1, 2027. The purchase agreement must accommodate some parking for the district; see note. [Note: The land is actually two mis-shaped parcels. The District must retain some of the land for parking. It may be best to subdivide the parcels to create two rectangular parcels, one small for the District and one large for the City to purchase.]

- The District commits to continuing to support an agriculture education program, and to actively seek to purchase land supporting this program.

- District will construct a school in 10-15 years; should OSD NOT construct a school, District would give the City a one-time right of first refusal re-purchase of property at its then fair market value.

Immediate Shared Costs and Commitments of Co-location

- Frontage and infrastructure build:
  - District covers added development cost associated with school (sewer lift station and additional wetland mitigation (est. $650,000), to be built in Phase I.
  - District covers an added gopher mitigation fee (est. $650,000). (Gopher mitigation requires much design work at the time of mitigation; see design requirements in section, At Time of Construction.)
  - Tax and bond laws permit the district to spend tax resources on a school purpose. Therefore, District tax expenditures must be related to the build of the school. Simultaneously the district understands the need to make the park a welcoming, organized environment at Phase I.
    - District covers 70% of costs of Wiggins Road entrance and access improvements, to be built in Phase I.
    - District covers 70% of design and development for signaled pedestrian crossing near Spooner stand entrance, to be initiated in Phase I. The District and City will also consider whether other transportation-required measures meet this crossing need.
    - District builds 85% of all Yelm Highway frontage improvements or assists with immediate park frontage improvement plans.
    - If required due to the addition of the school, District covers full design and development for costs of Wiggins connection to Hamptons. (District would advocate the full development be delayed until school construction begins, but design now so that connections are planned.)
  - District and City will negotiate on the specifics of these aspects to identify District (and City's) cost and ensure that District expenditures are predictable and future-proof through a development agreement.

- District designs and builds one of the four soccer/Lacrosse/football fields (a running track is also incorporated into the District -built field).

- District will assume City's lease of the 22.91 acres (more or less) to/for the berry farm until the time it must end the lease to undertake construction.

- District will undertake a preliminary school, field and access road design--with City full participation--to facilitate the frontage and mitigation requirements, but also to ensure a cohesive design for the school and park, and to maximize opportunities for shared infrastructure (such as parking).

- Update and modernize the Joint Use Agreement by January 1, 2024, and include all future facilities related to co-location on the Yelm Highway property.

- Use agreement requires OPARD) to manage field scheduling for all Yelm Highway fields, similarly to other joint use fields. (Exception, district schedules use of 1 field for school day, 30 minutes prior to bell and 30 minutes after bell.)
- Once the auxiliary gym is built, OPARD will manage the second court of the auxiliary gym.
- No net loss of gym or field space, co-location is designed to add on to current levels of service (other facilities are not pulled out of the Joint Use Agreement).
- Consideration for school district use of fields for high school play-offs (typically 1-2 days a season).

At Time of Construction of School

- City staff and community are included in the school design process (to ensure that park and school are cohesive and park remains a prominent feature).

- District will design and construct an Auxiliary Gym with a full-size high school basketball court managed per the Joint Use Agreement for primarily community use, including permanent access to storage and restrooms. (The gym is sized to include 2 full basketball courts and each court converts to 2 full volleyball courts.)

Due to state grant deadlines and critical permitting timelines, there is a need to make a decision on this partnership in order to maintain our goal of starting Phase I construction in 2024. At the March 22, 2022 regular meeting, it is anticipated that City Council will evaluate the terms of the School District proposal and give City staff direction on how to proceed forward.

Neighborhood/Community Interests (if known):
Hundreds of community members have been involved in the ongoing Yelm Highway Community Park Master Plan process. Soccer players and neighbors from The Hamptons and Indian Summer neighborhoods have shown particular interest in this site. Recently, community members have also expressed support for the partnership proposed by the Olympia School District.

Options:

1. Move to authorize negotiation of the necessary agreements needed to execute a partnership with the Olympia School District to locate a secondary school at the Yelm Highway Community Park property based on the proposed terms.
2. Move to deny partnership with the Olympia School District to locate a secondary school at the Yelm Highway Community Park site and proceed with the Park Master Plan and Development.
3. Discuss this issue further at a future date, this could potentially impact the 2022 Grant cycle, permitting timelines, and cause delays with the anticipated goal of starting construction on phase I in 2024.

Financial Impact:
The proposal from the Olympia School District includes a land swap of additional park acreage, shared development costs for Phase I (estimated to be above $6 million in reduced costs to the City), and enhanced community access to School District fields and facilities at the Yelm Highway Community Park site.

Attachments:
Olympia School District Letter
Engage Olympia Project Webpage