Habitat Conservation Plan

for the Yelm subspecies of Mazama Pocket Gopher

(*Thomomys mazama yelmensis*)

for Steilacoom Road Infrastructure Improvements

and

Marvin Road and Mullen Road Intersection Infrastructure Improvements

in Thurston County, Washington

Prepared for:

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LIST OF ACROYNMS, ABBREVIATIONS, AND FREQUENTLY USED TERMS

Applicant	Refers to any person, as defined in section 3(13) of the ESA, who requires formal approval or authorization from a Federal agency as a prerequisite to conducting an action (50 CFR 402.02). The Applicant submitting this habitat conservation plan is Thurston County Public Works.
Bioswale	A constructed drainage course with gently sloped sides (less than 6%) designed to concentrate or remove sediment and pollution from surface water runoff by maximizing the time water spends in the swale. It may be filled with vegetation, compost and/or riprap.
Categorical Exclusion	(NEPA definition) A category of actions which do not individually or cumulatively have a significant effect on the human environment and which have been found to have no such effect in procedure adopted by a Federal agency in implementations of these regulations (Sec. 1507.3) and for which, therefore, neither an environmental assessment nor an environmental impact statement is required (40 CFR 1508.4).
Cespitose	Forming mats, growing in dense tufts.
Changed Circumstances	Changes in circumstances affecting a species or geographic area covered by a conservation plan or conservation agreement that can reasonably be anticipated by plan or agreement developers and USFWS and that can be planned for (e.g., the listing of new species, or a fire or other natural catastrophic event in areas prone to such events).
CFR	Code of Federal Regulations
Commission	Washington Fish and Wildlife Commission. The Washington Fish and Wildlife Commission's primary role is to establish policy and direction for fish and wildlife species and their habitats in Washington and monitor WDFW's implementation of the goals, policies, and objectives established by the Commission.
Conservation Banking	A method used to offset impacts occurring elsewhere to the same listed species. A "bank" consists of non-Federal land containing natural resource values conserved and managed in perpetuity. Conservation banking is a tool for Federal agencies, project applicants, and other entities to address the adverse effects of proposed actions on listed and other federally-managed species, and to support the recovery of listed species and their habitats. A conservation bank is a parcel of land containing natural resource values the banker has conserved, restored, created and managed in perpetuity for federal or state protected species.

Conservation Site	Conservation site refers to the site from which mitigation will be purchased to offset project impacts. The conservation site may be either a USFWS-approved conservation owned by a HCP/ITP Permit Holder, or a USFWS-approved conservation bank site.
Covered Activities	Activities that a permittee will conduct for which take is authorized in an ESA section 10 permit. The Covered Activities include all actions in the plan area that are 1) likely to result in incidental take, 2) are reasonably certain to occur over the life of the permit, and 3) are under the Applicant's control. The covered activities include work related to project construction.
Covered Species	Species for which incidental take is authorized in an incidental take permit and is adequately covered in a habitat conservation plan. The proposed covered species that is the subject of this habitat conservation plan is the Yelm subspecies of the Mazama pocket gopher (*Thomomys mazama yelmensis*), also referred to as the Yelm pocket gopher.
EA	(NEPA definition) Environmental Assessment. A concise public document, prepared in compliance with NEPA, that briefly discusses the purpose and need for an action, alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an Environmental Impact Statement or Finding of No Significant Impact (40 CFR 1508.9).
EIS	(NEPA definition) Environmental Impact Statement. A detailed written statement required by section 102(2)(C) of NEPA containing, among other things, an analyses of environmental impacts of a proposed action and alternative considered, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources (NEPA section 102(2)(C); 40 CFR 1508.11 and 40 CFR 1502).
ESA	Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543; 87 Stat 884) (50 CFR 17.3)
FR	The Federal Register is the official journal of the Federal government that contains most routine publications and public notices of government agencies. The Federal Register is compiled by the Office of the Federal Register (within the National Archives and Records Administration) and is printed by the Government Printing Office. Section 10(c) of the ESA requires each application for an exception or permit under Section 10 to be published in the Federal Register.
Harm	Defined by USFWS to mean "an act which actually kills or injures wildlife. Such act may include significant habitat modification or

	degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering" (50 CFR 17.3).
HCP	Habitat Conservation Plan
ITP	Incidental Take Permit. A permit issued under section 10(a)(1)(B) of the ESA to a non-Federal party undertaking an otherwise lawful project that might result in the take of an endangered or threatened species. Application for an incidental take permit is subject to certain requirements, including preparation by the permit applicant of a conservation plan, generally known as a "Habitat Conservation Plan" or "HCP."
LLC	Limited Liability Company
NEPA	National Environmental Policy Act of 1969, as amended (42 U.S.C. § 4321 et seq.). A Federal statute that requires Federal agencies to consider the environmental impacts of their discretionary proposed actions, and for significant environmental actions seeking public input on decisions and implementation of Federal actions.
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
Permit Area	The geographic area where the incidental take permit applies. It includes the area under the control of the Applicant/permittee where covered activities will occur. The permit area must be delineated in the permit and be included within the plan area of the HCP. The permit area includes the Steilacoom Road and Marvin-Mullen Road project sites covered by the HCP and the requested Incidental Take Permit.
Plan Area	The specific geographic area where covered activities described in the HCP, including mitigation, may occur. The plan area must be identified in the HCP. The plan area is the range of the Yelm pocket gopher since the conservation site is undetermined at this time.
Project site	For Steilacoom Road the project site includes Steilacoom Road and areas adjacent to Steilacoom Road between Pacific Avenue and Marvin Road where construction and development activities covered by this HCP will occur. For Marvin-Mullen Road the project site includes the Marvin Road and Mullen Road intersection and adjacent areas where construction and development activities covered by this HCP will occur.

RCW	Revised Code of Washington
Rhizomatous	Spreading by roots
RPA	Reserve Priority Area
Take	"…to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct" (ESA Section 3)
Threatened species	Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (ESA section 3(20); 50 CFR 424.10(m)).
TIB	Transportation Improvement Board
Unforeseen circumstances	Changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that could not reasonably have been anticipated by plan or agreement developers and USFWS at the time of the conservation plan's or agreement's negotiation and development, and that result in a substantial and adverse change in the status of the covered species (50 CFR 17.3).
UGA	Urban Growth Area
USC	United States Code
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

Introduction

Thurston County Public Works (the Applicant) is proposing safety and infrastructure improvements and has jurisdiction over the right-of-way along Steilacoom Road, between Pacific Avenue and Marvin Road and at the Marvin Road SE and Mullen Road SE intersection (the project sites), in Thurston County, Washington (see Figure 1 "Vicinity Map").

The Applicant recognizes that the Steilacoom Road right-of-way extending from Marvin Road west for approximately 2,900 feet and the Marvin Road SE and Mullen Road SE intersection are occupied by and contains habitat for the Yelm subspecies of Mazama pocket gopher (*Thomomys mazama yelmensis*, hereafter Yelm pocket gopher), a species listed as threatened under the Endangered Species Act of 1973, as amended (87 Stat. 884; 16 U.S.C. 1531 et seq.) (ESA). The Applicant acknowledges that it will not be possible to completely avoid impacts to this species and its habitat while engaging in the otherwise lawful roadside improvements on the Project Sites. This Habitat Conservation Plan (HCP) has been prepared in partial fulfillment of requirements to seek an Incidental Take Permit (ITP) under Section 10(a)(1)(B) of the ESA. An ITP provides exceptions to the prohibitions against "take" of species listed under the ESA under specified conditions and in compliance with all other applicable laws and regulations.

Steilacoom Road

The Steilacoom Road infrastructure improvements project will widen the existing pavement, add auxiliary turn lanes, install bicycle lanes and sidewalks, and add storm water treatments including a stormwater pond and bioswales within the existing right-of-way (ROW) between Pacific Avenue and Marvin Road within the City of Lacey's Urban Growth Area (UGA).

Marvin-Mullen Road

The Marvin Road SE and Mullen Road SE intersection project is designed as a roundabout in order to improve traffic flow through the Marvin Road and Mullen Road T-intersection within the City of Lacey's UGA. Marvin Road is a major north-south road corridor that extends through Lacey, and Mullen Road is a main east-west arterial route. This intersection and infrastructure improvement project includes construction of a roundabout, new sidewalks, street lighting, new storm drainage conveyance systems, storm drainage infiltration and treatment facilities, modification of existing storm drainage facilities, utility modifications, landscaping, and striping/signing.

In this HCP, the Applicant proposes a conservation program intended to minimize and mitigate unavoidable impacts to this species and its habitat. The total area affected by construction of the two projects is 5.3 acres, and approximately 3 acres contains occupied and/or suitable Yelm pocket gopher habitat. Conservation program avoidance and minimization actions will take place on the project sites. To compensate for 3 acres of habitat impact, the Applicant will purchase 4 acres of mitigation (2 acres for each project site) at a 1:1.25 mitigation ratio for out of service area mitigation from a USFWS-approved conservation site owned by a HCP/ITP Permit Holder or a USFWS-approved conservation bank that is occupied by the Yelm pocket gopher to fully offset the impacts of the taking expected to occur at the project sites. Conservation site and conservation bank are both described interchangeably as the conservation site in this HCP.

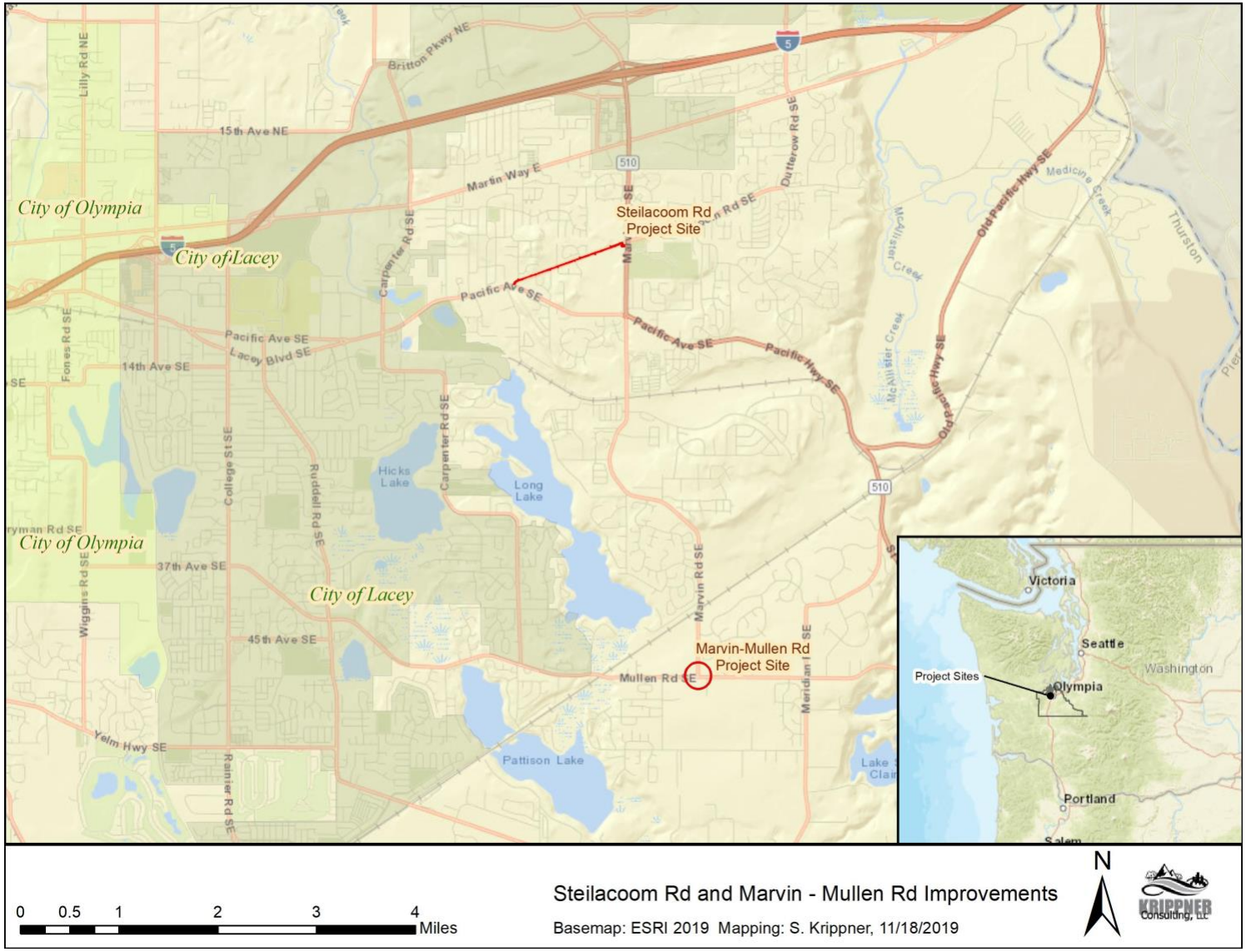


Figure 1. Vicinity Map

Regulatory Framework

The Endangered Species Act

The U.S. Congress enacted the ESA to protect plants and animals threatened with or in danger of extinction. The USFWS is responsible for implementing the ESA for those species under its jurisdiction. Except where take is exempted under Section 4(d) of the ESA or approved pursuant to Section 7 or 10, take of any fish or wildlife species that is federally listed as threatened or endangered is prohibited under Section 9 of the ESA.

Section 3 of the ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct" (16 United States Code [USC] § 1532 (19)). The term "harm" is defined to include any act "which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 C.F.R. § 17.3).

Section 7(a)(2) of the ESA requires each Federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat (16 USC § 1536 (a)(2)). Issuance of an ITP is a Federal action that requires USFWS consultation in accordance with Section 7.

Section 10 of the ESA allows non-Federal Applicants, under certain terms and conditions, to incidentally take ESA-listed species that would otherwise be prohibited under Section 9. When a non-Federal landowner or other non-Federal entity wishes to proceed with an activity that is legal in all other respects, but that may result in the incidental taking of a listed species, an ITP is required. Incidental take is defined as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity" (50 CFR § 17.3). Section 10 of the ESA requires that Applicants submit an HCP as a component of an application for an ITP. The USFWS is required to verify that the HCP complies with the provisions of the ESA [50 CFR 17.22 (b)(2)] prior to issuance of an ITP.

An HCP submitted in support of a Section 10 permit application must specify (16 U.S.C. § 1539(a)(2)(A)(i)-(iv); 50 C.F.R. § 17.22(b)(1)(iii)):

- The impact that will likely result from such taking;
- What steps the Applicants will take to monitor, minimize, and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances;
- What alternative actions to such taking the Applicants considered and the reasons why such alternatives are not proposed to be utilized; and
- Such other measures that the Director (of USFWS) may require as being necessary or appropriate for purposes of the plan.

To issue an incidental take permit, USFWS must find that (16 U.S.C. § 10(a)(2)(B); 50 C.F.R. §§ 17.22(b)(2) and 17.32(b)(2)):

- The taking will be incidental;
- The Applicants will, to the maximum extent practicable, minimize and mitigate the impacts of such takings;
- The Applicants will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided;
- The Applicants will ensure that adequate funding for the conservation plan and procedures to deal with unforeseen circumstances will be provided;
- The taking will not appreciably reduce the likelihood of survival and recovery of the species in the wild;
- The measures, if any, required under paragraph (b)(1)(iii)(D) of this section will be met; and
- (The Director) has received such other assurances as he or she may require that the plan will be implemented.

National Environmental Policy Act

The National Environmental Policy Act of 1969, as amended (NEPA) (42 U.S.C. § 4321 et seq.), requires that Federal agencies analyze and publicly disclose the social, economic and environmental effects associated with "major Federal actions" (§ 4332). The issuance of an ITP under Section 10(a)(1)(B) of the ESA is considered a "major Federal action" and is therefore subject to NEPA compliance. The Applicants understand that USFWS is required to complete a NEPA analysis of the effects of issuing the requested permit on the "human environment", including the incidental take authorized by permit issuance and the effects associated with implementation of an HCP. The results of this analysis will be documented in either an Environmental Action Statement supporting a determination that an action can be categorically excluded from further analysis, an Environmental Assessment supporting a Finding of No Significant Effect, or an Environmental Impact Statement resulting in a Record of Decision.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC § 40 et seq.) (NHPA), requires Federal agencies to take into account the effects of their undertakings on properties eligible for inclusion in the National Register of Historic Places. An undertaking is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency; including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency. "Properties" are defined as "cultural resources," which includes

prehistoric and historic sites, buildings, and structures that are listed or eligible for listing in the National Register of Historic Places.

Other Relevant Laws and Regulations

The Washington Fish and Wildlife Commission (Commission) is the supervising authority for the Washington Department of Fish and Wildlife (WDFW). The Commission's primary role is to establish policy and direction for fish and wildlife species and their habitats in Washington and monitor implementation of the goals, policies, and objectives established by the Commission. The Commission also classifies wildlife and establishes the basic rules and regulations governing the time, place, manner, and methods used to harvest or enjoy fish and wildlife. The Washington Administrative Code (WAC) defines endangered as:

> "*any wildlife species native to the state of Washington that is seriously threatened with extinction throughout all or a significant portion of its range within the state*" (WAC 232-12-297, § 2.4);

and defines threatened as:

> "*any wildlife species native to the state of Washington that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range within the state without cooperative management or removal of threats*" (WAC 232-17-297, § 2.5).

The Commission designated the Mazama pocket gopher in the state as threatened in 2006 (WAC 232-12-011[1]). This designation classifies the species as protected wildlife (WAC 121-12-011) subject to regulation under the Revised Code of Washington (RCW 77.12). Unlawful taking of species designated as threatened by the Commission is prohibited under state law (RCW 77.15.130).

Washington State Code provides that taking of endangered and threatened fish and wildlife is not unlawful if authorized by a permit issued under the ESA (RCW 77.15.130(1)(c)(ii)). The Applicants will satisfy Washington State prohibitions against taking state-listed species by securing an ESA permit authorizing incidental take of the federally-listed Yelm pocket gopher.

The Applicant will comply with relevant Thurston County Ordinances and secure applicable permits and project approvals. Permits likely to be required include but are not limited to those for clearing and grading, utilities, road construction, and stormwater facilities.

Purpose and Need

This HCP was prepared to meet statutory, regulatory, and policy requirements for issuance of an ITP. The USFWS may authorize incidental take by a non-Federal entity though the issuance of an ITP in accordance with Section 10(a)(1)(B) of the ESA. As part of the application for an ITP, the Applicant must prepare an HCP. The purposes of this HCP are to:

1. Describe the anticipated impacts of the project and the conservation program on the covered species and its habitat;
2. Establish measures to ensure that any take associated with the project and conservation program will be incidental;
3. Ensure that the impacts of the taking will be minimized and mitigated to the maximum extent practicable, including provisional procedures to deal with changed and unforeseen circumstances;
4. Ensure that mitigation for impacts to listed species will result in conservation value to the species that adequately offsets the impacts;
5. Ensure that adequate funding for implementation of the conservation program will be provided; and
6. Ensure that the take of listed species will not appreciably reduce the likelihood of the survival and recovery of the species in the wild.

The Applicant is requesting an ITP because it will not be possible to completely avoid all adverse effects to the threatened Yelm pocket gopher and its habitat while engaging in the otherwise lawful construction of public safety and infrastructure improvements at the project sites. Activities that result in take of listed species in the absence of an ITP constitute a violation of the prohibitions in Section 9 of the ESA.

Permit Duration

The Applicant requests a 10-year renewable ITP. The Applicant believes construction of the projects will be completed and that the HCP will achieve the described conservation goals within that time frame. If the proposed projects are not completed before the permit expires, the Applicant will seek to renew the permit to ensure coverage for the remaining Covered Activities. The permit renewal process is described in the Permit Amendments section of this document.

Plan Area and Permit Area

The Plan Area for an HCP includes the specific geographic area where all relevant aspects of the proposal including the Permit Area where the covered activities will take place, and the location of the proposed mitigation.

Plan Area

The Plan Area includes the project sites where covered activities described in this HCP will occur and the conservation site where offsetting mitigation for the Yelm pocket gopher will be provided.

This HCP describes the Applicant's proposal to fully offset the effects of unavoidable incidental take and contribute to the conservation of the Yelm pocket gopher by securing 4 acres of mitigation at a USFWS-approved conservation site within the range of and occupied by the Yelm pocket gopher.

Permit Area

The Permit Area includes the 3.26-acre Steilacoom Road project site (see Figure 2 "Steilacoom Road Project Site") and the 2.05-acre Marvin-Mullen Road project site (see Figure 3 "Marvin-Mullen Road project site") where Covered Activities and resulting incidental take will occur.

Steilacoom Road

The Steilacoom Road project site is located on glacial outwash soils in the south Puget Sound region. These glacial soils include fine loamy sands, sandy loams, and gravelly sandy loams. Soils on much of the project site have previously been disturbed and compacted by various road construction-related and urban residential activities. Non-native rhizomatous grasses and weedy forbs dominate the vegetation community where gopher mounds have been observed west of Marvin Road. Remnant patches of native prairie plants and several young Oregon white oak trees are also present on this east portion of the project site west of Marvin Road. In this area, Nisqually Middle School grounds bound the project site to the north and undeveloped land owned by the City of Lacey is to the south. Other project site areas are bounded by urban residential development and include road cuts and fills; drainage ditches; forest and shrub vegetation; and manicured lawn.

Marvin-Mullen Road

The Marvin-Mullen Road project site is also located on glacial outwash soils in the south Puget Sound region. Soils on the project site immediately adjacent to existing roads are relatively compact and gravelly, but soils beyond this are Nisqually loamy fine sand, suitable for gophers. Non-native rhizomatous grasses and weedy forbs dominate the vegetation community where gopher mounds have been observed on either side of Marvin Road north of Mullen Road. Vegetation south of Mullen Road includes mowed grass, scattered trees and forest, and shrub thickets.

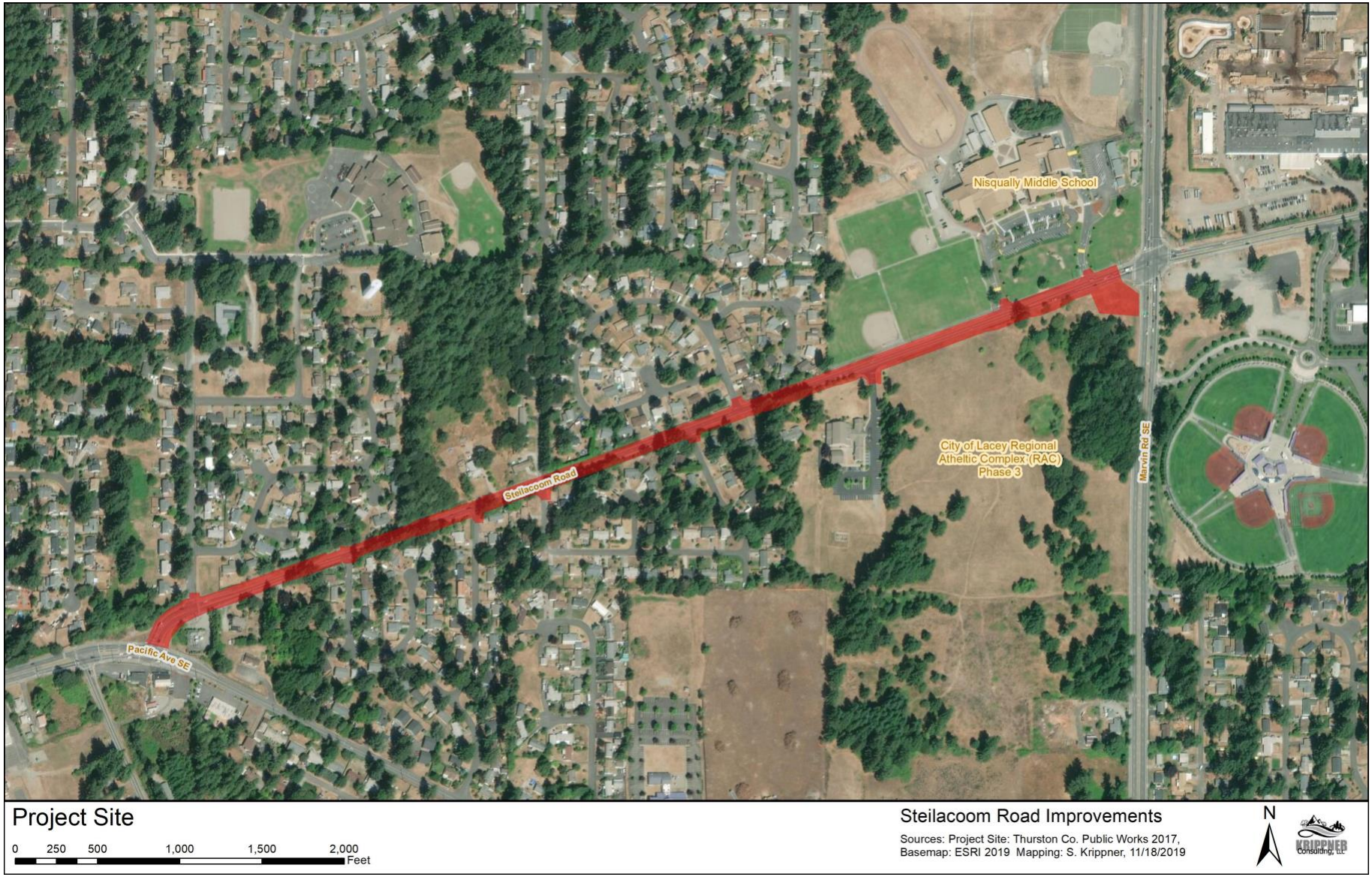


Figure 2. Steilacoom Road Project Site

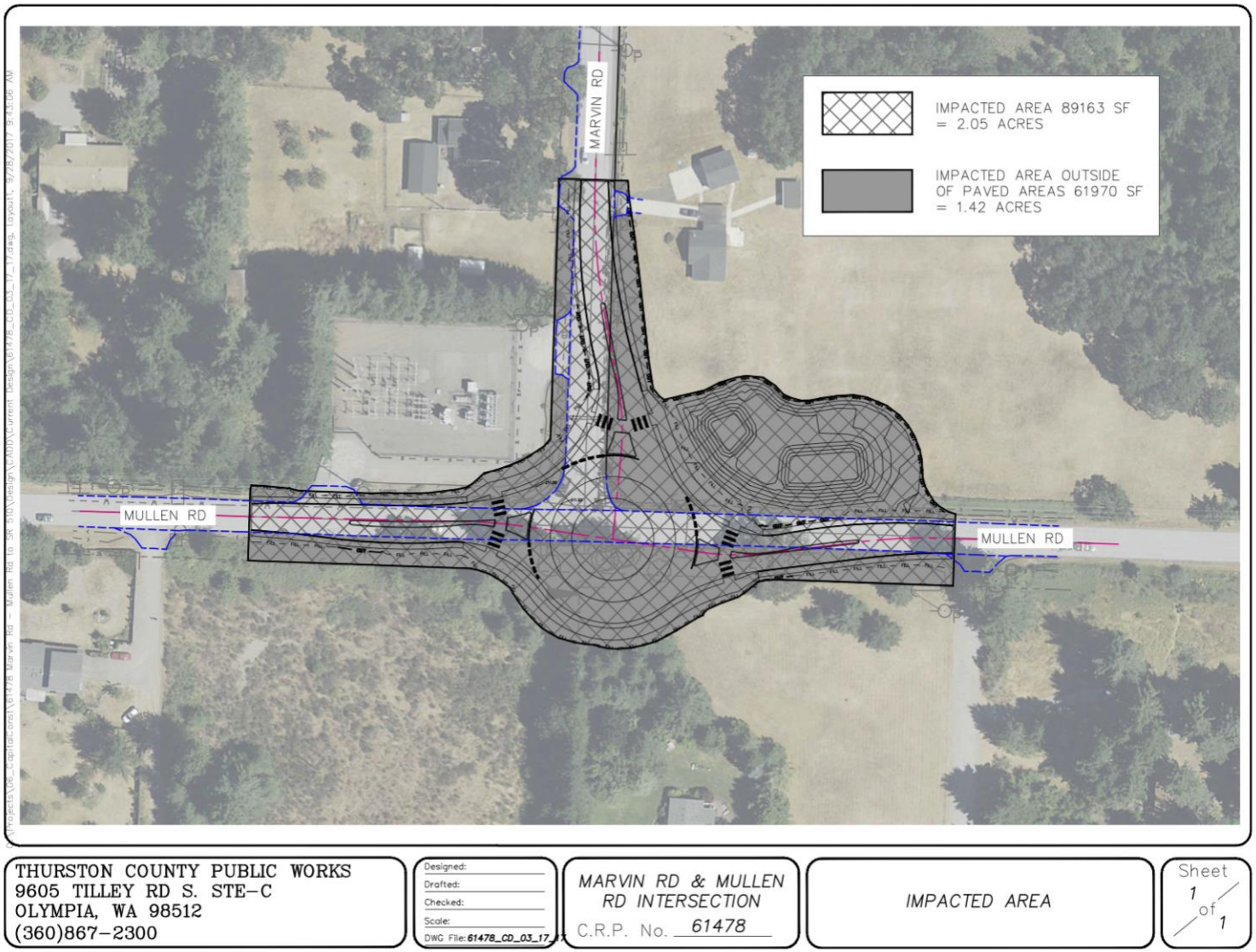


Figure 3. Marvin-Mullen Road Project Site

Project Description

Steilacoom Road

The Applicant is proposing to construct road safety improvements, including auxiliary turn lanes, sidewalks, bike lanes, and a storm water pond and bioswales on the project site (see Figure 2 "Steilacoom Road Project Site"). The project is expected to begin within 4-5 years of permit issuance, and will take approximately 18 months to complete, but may be completed in accordance with this HCP at any time during the requested 10-year permit term.

Steilacoom Road between Pacific Avenue and Marvin Road, County Road Project (CRP) 61461, is a safety project that will widen the existing pavement, provide two 11-foot wide travel lanes, two 5-foot wide bicycle lanes, and two 6-foot wide sidewalks. Auxiliary turn lanes will be added along the full frontage of Nisqually Middle School and the proposed third phase of the City of

Lacey's Regional Athletic Complex (RAC), which is across the street from the middle school. The proposed project will clear trees, brush, and other vegetation from the existing and proposed right-of-way to accommodate the proposed infrastructure improvements.

The Applicant has determined that site preparation, construction, and development activities cannot completely avoid impacts to listed species or their habitats on these parcels.

Marvin-Mullen Road

The Applicant is proposing to improve traffic flow at the Marvin Road and Mullen Road intersection by constructing a roundabout with new sidewalks, street lighting, storm drainage conveyance systems, storm drainage infiltration and treatment facilities, landscaping, and striping/signing. The project will also include modification of existing storm drainage facilities, and utility modifications on the project site (see Figure 3, "Marvin-Mullen Road Project Site"). The project is expected to begin upon permit issuance, and will take approximately 18 months to complete, but may be completed in accordance with this HCP at any time during the 10-year requested permit term.

The proposed project to improve the Marvin Road and Mullen Road intersection will clear trees, brush, and other vegetation from the existing and proposed right-of-way to accommodate the proposed infrastructure improvements.

The Applicant has determined that site preparation, construction, and development activities cannot completely avoid impacts to listed species or their habitats on the project site.

Covered Activities

Steilacoom Road

Covered activities include actions related to development, construction, and restoration of areas temporarily disturbed during construction, including the staging area and stormwater areas. The steps required for constructing and maintaining the road safety improvements follow this general sequence of events:

1) Installation of construction fencing - Temporary construction fencing is installed to limit the area of disturbance.

2) Establishment of staging area for equipment and materials – A temporary staging area for construction management trailers, equipment storage, aggregate, topsoil, and other construction-related requirements is set-up at the southwest corner of Steilacoom Road and Marvin Road. Quarry spalls are laid on top of geofabric to create the staging area pad.

3) Move or install utilities – Existing above ground or underground utility lines, such as water, sewer, cable, or electricity, may be relocated.

4) Clearing and grubbing vegetation - Vegetation is cleared and grubbed where safety improvements are planned. Equipment that may be used for vegetation clearing and grubbing are mowers, brush cutters, rotary cutters, chain saws, chippers, stump grinders, graders, excavators, and dump trucks.

5) Installation of temporary storm water controls - Storm water management controls, such as straw wattles, sediment fencing and infiltration basins, may be installed in the project area before or during construction. Creation of temporary erosion control features such as infiltration basins may require excavation and grading.

6) Excavation and grading - Soils on the site are graded and leveled by cut and fill in accordance with approved project plans. Equipment used for these tasks includes graders, excavators, and dump trucks.

7) Construct retaining walls – Retaining walls are used to minimize project impact areas. Concrete blocks will be placed individually with equipment to form the retaining walls to stabilize cut and fill slopes where there are grade variations. Equipment used includes concrete mixer trucks, concrete pump trucks, and pavers.

8) Construct permanent storm water facilities – Permanent storm water facilities include a stormwater pond at the west end of the project and bioswales that will be located mainly between the roadway and sidewalk areas. Equipment used for these tasks are graders, scrapers, and dump trucks.

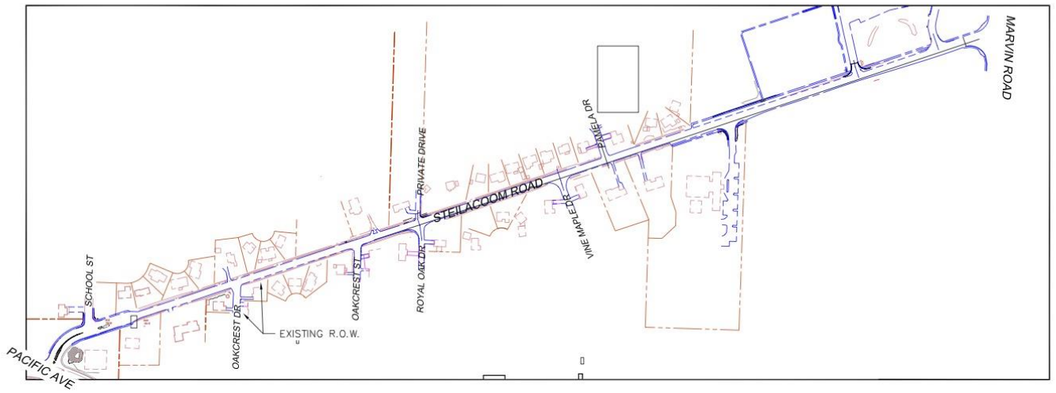
9) Addition and compaction of fill - Aggregate fill material is spread and compacted for new roadway and sidewalk surfaces. New surfaces will be paved. Equipment used for these

tasks are graders, scrapers, rollers, dump trucks, concrete mixer trucks, concrete pump trucks, and pavers.

10) Soil restoration and seeding – Quarry spalls and geofabric will be removed, then native soils will be loosened by ripping or disking and seeded with an erosion control mix that may include native prairie forbs in the staging area. Native soils mixed with compost will be used to create bioswale areas then they will be seeded with an erosion control grass mix. Other project site areas may be seeded with grasses for erosion control and storm water treatment or landscaped in accordance with Lacey Urban Growth Area (UGA) requirements following construction.

11) Installation of Oregon white oak seedlings – Oregon white oak seedlings will be installed near a stand of existing oaks south of Steilacoom Road, near Marvin Road.

Site plan drawings showing the location and extent of project activities are provided in Figures 4 through 8, also called Sheets 1 through 5.



OVERALL SITE PLAN

OVERALL PROJECT AREA CALCS.

EXISTING IMPERVIOUS SURFACE WITHIN R.O.W.
TOTAL = 169,335 sf

NEW PROPOSED IMPERVIOUS SURFACE – 54,374 sf
TOTAL = 219,908 sf

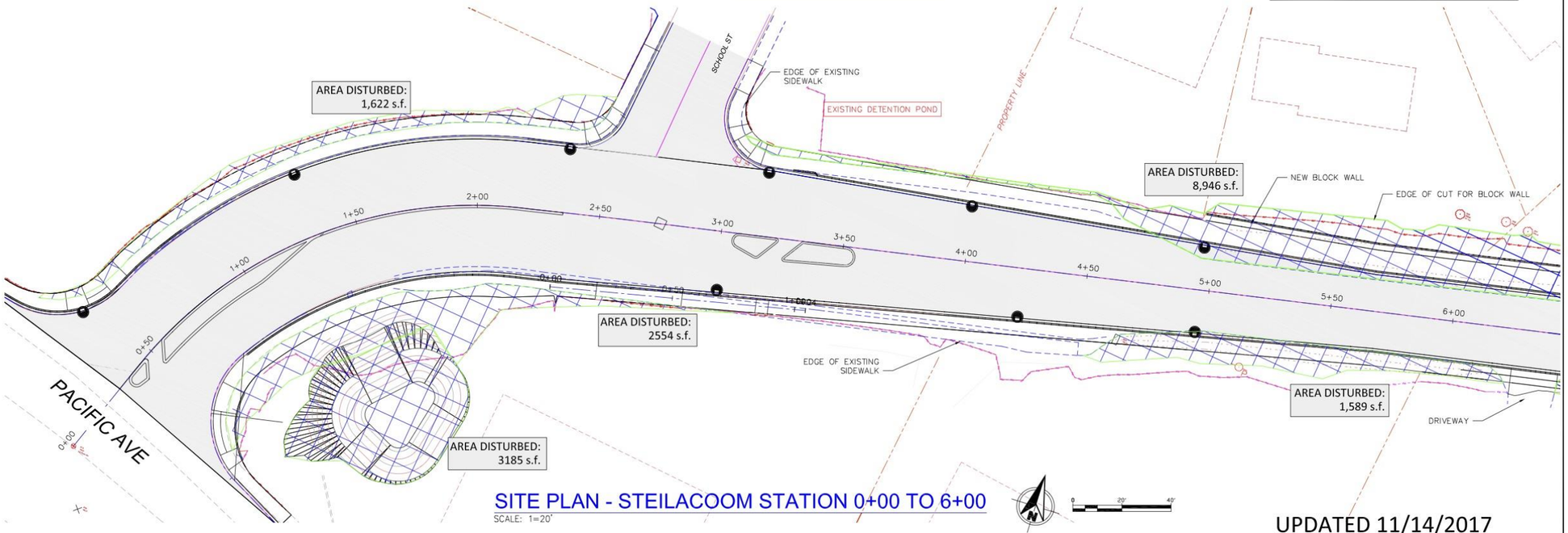
NEW AMENDED SOIL – 40,875 sf

AREAS OF CONSTRUCTION DISTURBANCE OUTSIDE OF R.O.W. (NOT IMPERVIOUS TO BE RESTORED)
18,549 sf

ACTIVELY LANDSCAPED FRONTAGE AREA WITHIN R.O.W. 63,925 sf

TOTAL DISTURBED PROJECT AREA:

120,232 s.f. – 2.76 Acres
+ 21,802 s.f. Staging area to be restored.
Total = 142,034 s.f. – 3.26 acres



SITE PLAN - STEILACOOM STATION 0+00 TO 6+00
SCALE: 1=20'

UPDATED 11/14/2017

THURSTON COUNTY PUBLIC WORKS
DESIGN SECTION
9605 TILLEY RD S. STE-C, OLYMPIA, WA 98512
(360)867-2300

Designed: ***
Drafted: ***
Checked: ***
Scale: AS NOTED
POCKET GOPHER OVERALL IMPERVIOUS AREA PLAN SHEET FINAL DESIGN

Date

STEILACOOM ROAD

CRP No. #### F.A. No. ####

SITE PLAN

Sheet 1 of 5

Figure 4. Steilacoom Road Site Plan Drawing – Sheet 1 of 5

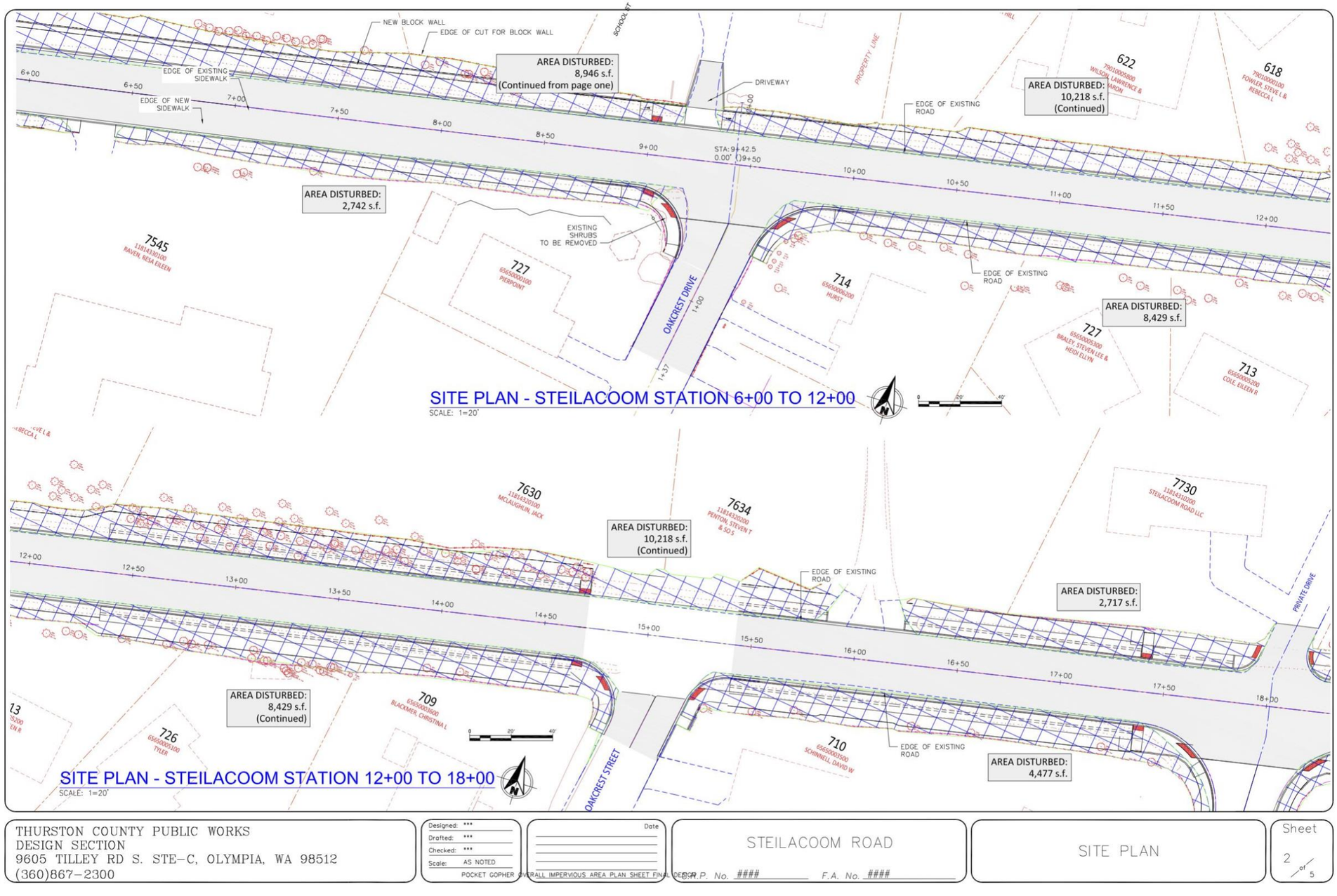


Figure 5. Steilacoom Road Site Plan Drawing – Sheet 2 of 5

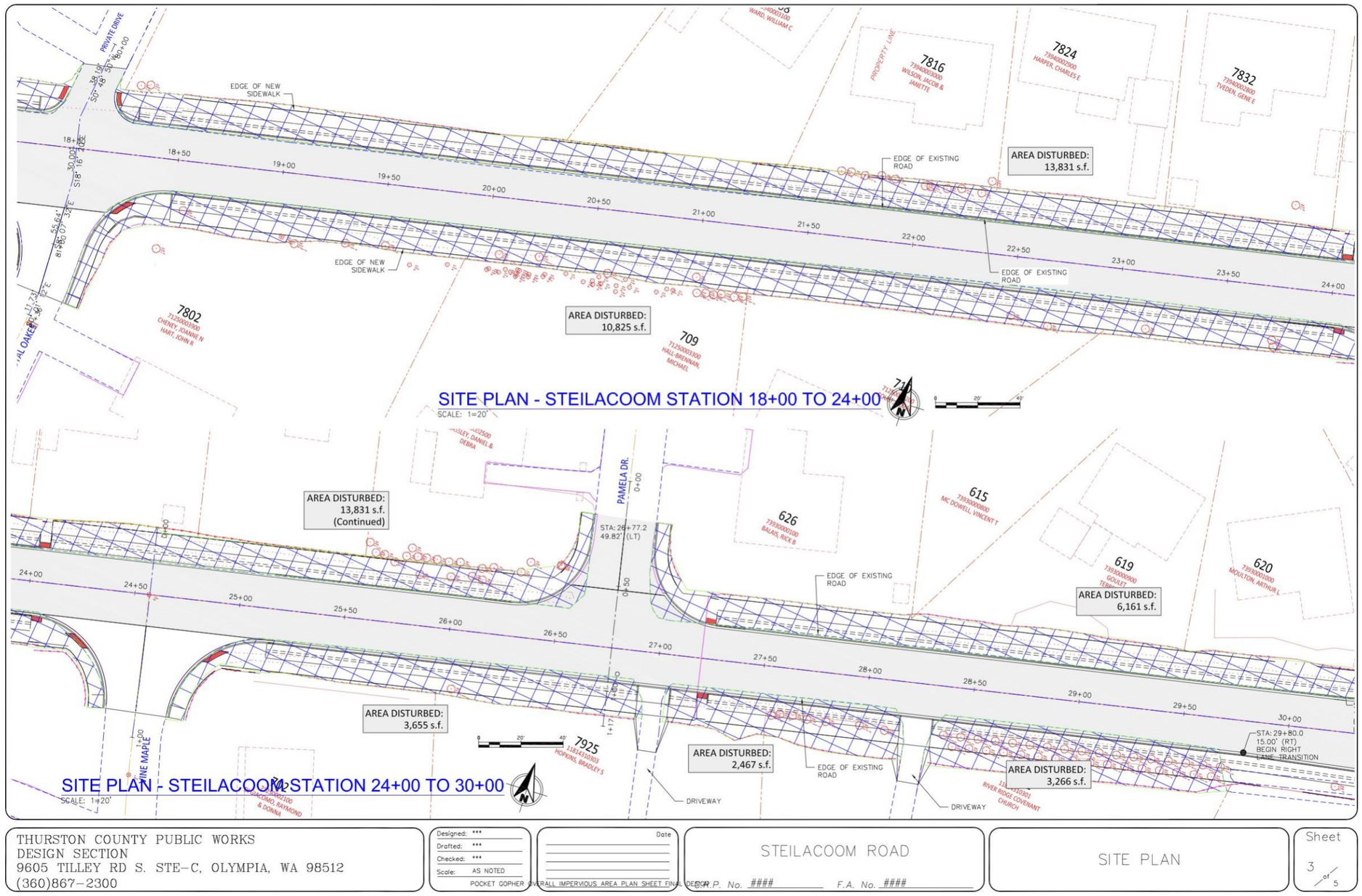


Figure 6. Steilacoom Road Site Plan Drawing – Sheet 3 of 5

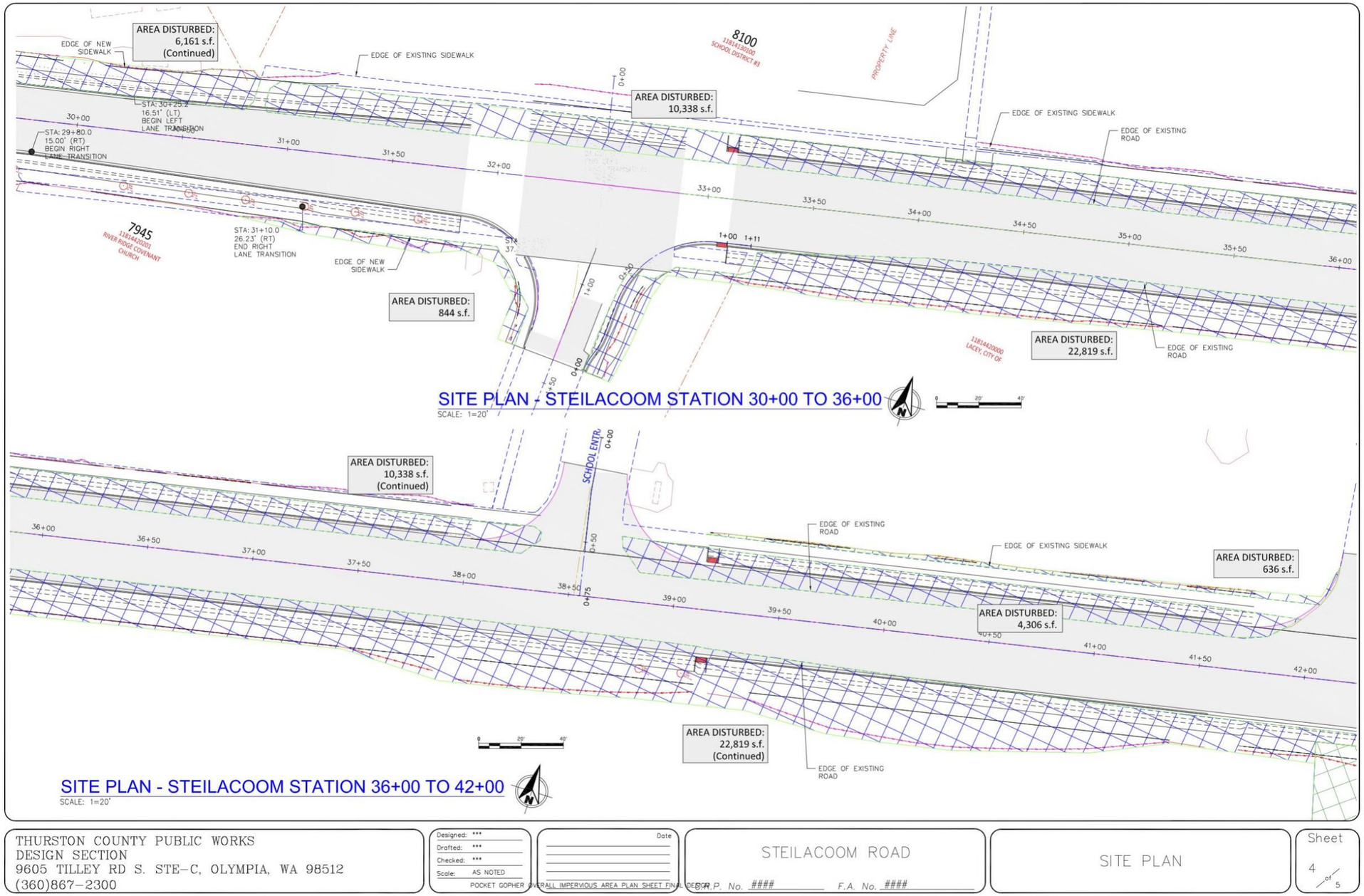


Figure 7. Steilacoom Road Site Plan Drawing – Sheet 4 of 5

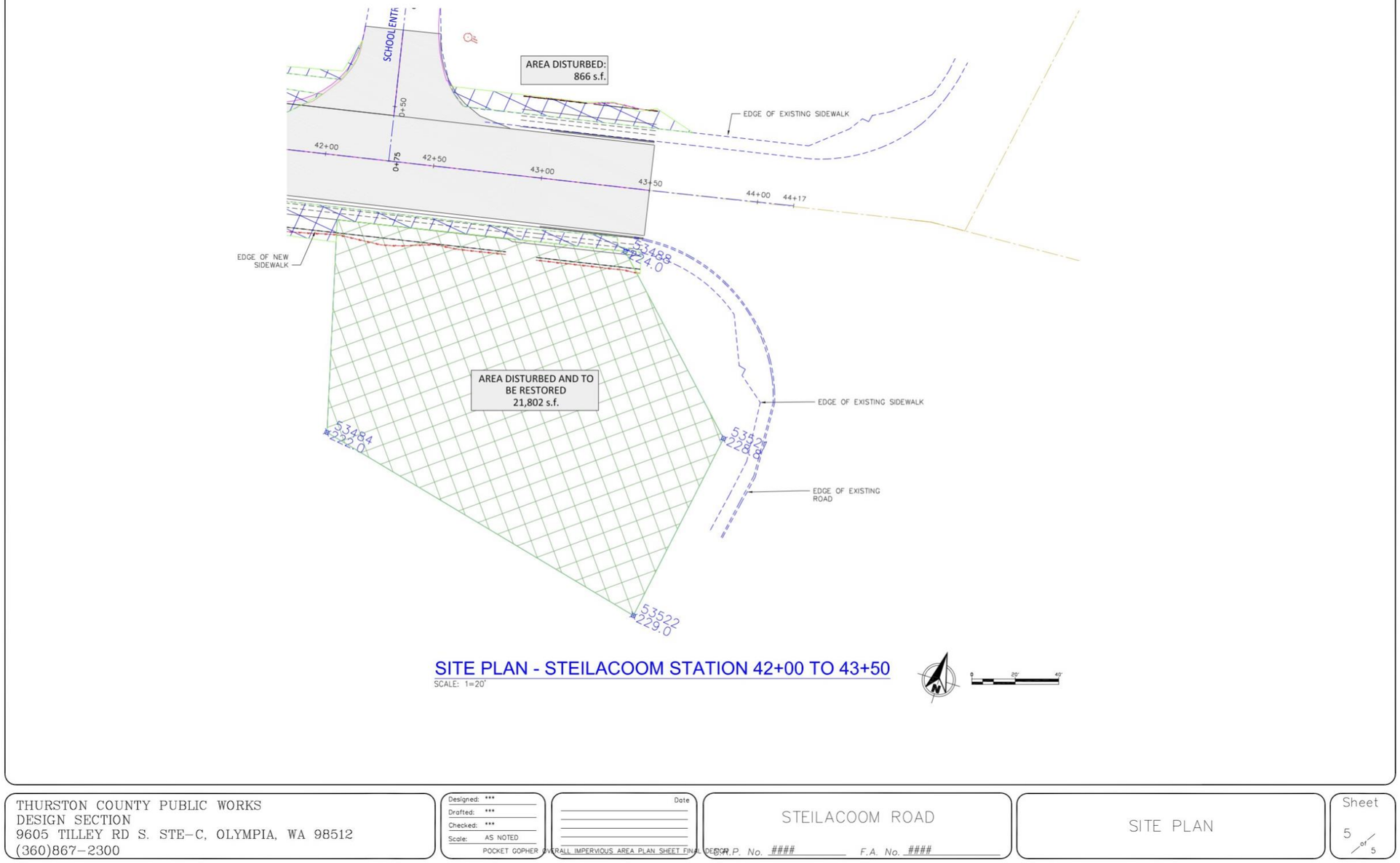


Figure 8. Steilacoom Road Site Plan Drawing – Sheet 5 of 5

Covered activities include actions related to development, construction, and restoration of areas temporarily disturbed during construction. The steps required for constructing the roundabout and related intersection improvements follow this general sequence of events:

1) Installation of construction fencing - Temporary construction fencing is installed to limit the area of disturbance.

2) Establishment of staging area for equipment and materials – A temporary staging area for construction management trailers, equipment storage, aggregate, topsoil, and other construction-related requirements is within the project site area outlined in Figure 3. Quarry spalls are laid on top of geofabric to create a temporary staging area pad.

3) Move or install utilities – Existing above ground or underground utility lines, such as water, sewer, cable, or electricity, may be relocated.

4) Clearing and grubbing vegetation - Vegetation is cleared and grubbed where intersection improvements are planned. Equipment that may be used for vegetation clearing and grubbing includes mowers, brush cutters, rotary cutters, chain saws, chippers, stump grinders, graders, excavators, and dump trucks.

5) Installation of temporary storm water controls - Storm water management controls, such as straw wattles, sediment fencing and infiltration basins, may be installed in the project area before or during construction. Creation of temporary erosion control features such as infiltration basins may require excavation and grading.

6) Excavation and grading - Soils on the site are graded and leveled by cut and fill in accordance with approved project plans. Equipment used for these tasks includes graders, excavators, and dump trucks.

7) Construct permanent storm water facilities – Permanent storm water facilities include infiltration and treatment basins. Native soils will be used where possible, and an erosion control grass mix will be used for vegetating side slopes and basins.

8) Addition and compaction of fill - Aggregate fill material is spread and compacted for new roadway and sidewalk surfaces. New surfaces will be paved. Equipment used for these tasks are graders, scrapers, rollers, dump trucks, concrete mixer trucks, concrete pump trucks, and pavers.

9) Landscaping – Roadsides will be landscaped in accordance with Thurston County requirements following construction.

Environmental Setting and Biological Resources

The Plan Area has a maritime west coast climate with relatively mild (above freezing), wet winters and dry summers. The average annual rainfall in Olympia is 50 inches. City streets, streams, and rivers often flood during major storms that mostly occur from November through February. Drainage ditches along Steilacoom Road, Marvin Road, and Mullen Road convey storm water during and following precipitation events.

Steilacoom Road

Plan Area topography is rolling to flat. The project site is relatively flat with slopes less than 3%. Soils formed in glacial outwash include Nisqually fine sandy loam and Spanaway gravelly sandy loam. Soils formed on glacial till plains and drainage ways include Norma silt loam.

Land along the project site corridor is used for schools, residential, and neighborhood commercial purposes. Open space, including ball fields and undeveloped grassland in school zone areas, is limited to the east portion of the project site.

Vegetation communities present along the project site corridor include developed lawn, ornamental shrubs, native forest and shrub, and grassland dominated by weedy forbs and non-native, rhizomatous grasses. In grassland areas, common grasses include bentgrass (*Agrostis sp*.), orchardgrass (*Dactylis glomerata*), and crabgrass (*Digitaria sp.*) and common forbs include hairy cat's ear (*Hypochaeris radicata*), sheep sorrel (*Rumex acetosella*), Queen Ann's lace (*Daucus carota*), dandelion (*Taraxacum officinale*), narrowleaf plantain (*Plantago lanceolata*), and vetch (*Vicia sp*.). Other plants common in grassland areas include snowberry (*Symphoricarpos albus*), trailing blackberry (*Rubus ursinus*), and bracken fern (*Pteridium aquifolium*). Grassland habitats are mowed on a regular basis in school zone areas.

Habitat conditions on the project site were surveyed on March 28 and May 8, 2017. Photo point and survey locations are shown on Figure 9 and are described on the pages that follow. Photo points are labeled pp1 through pp7. Data at pp6 was collected to document conditions in the approximate location where Oregon white oak seedlings will be planted to mitigate for project impacts to oak seedlings and saplings in the project site area.

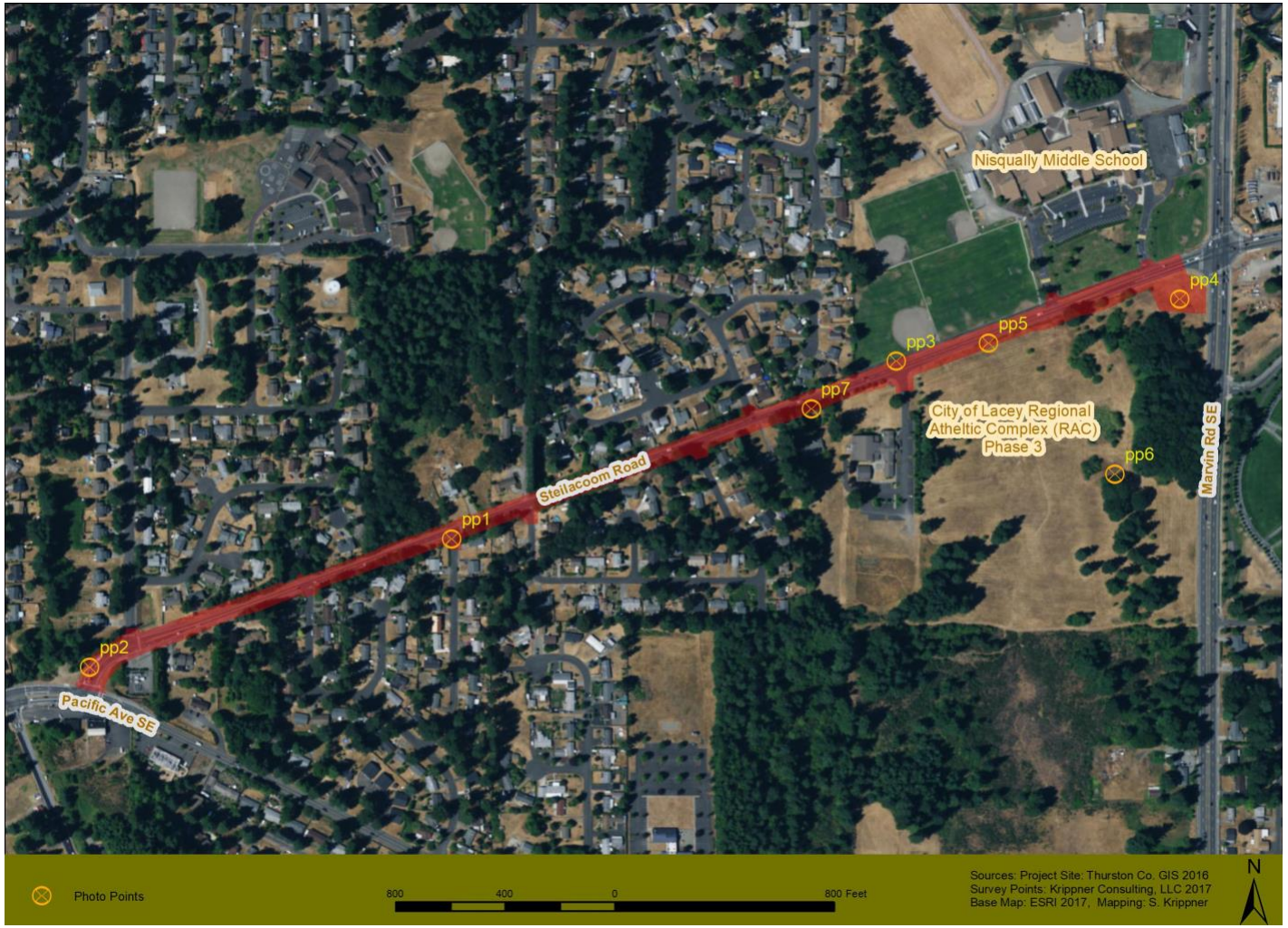


Figure 9. Steilacoom Road Photo Point and Survey Plot Locations

Photo Points 1 and 2

Photo Points 1 through 6 recorded on March 28, 2017

Photo Point 1 View east No gopher occupancy recorded Vegetated areas are limited to small patches of maintained lawn unlikely to provide gopher habitat due to small patch size, compacted gravelly soils, and lack of continuity with occupied habitat areas	
Photo Point 1 View west Project site areas adjacent to Steilacoom Road include dense forest, drainage ditches, and road cuts.	
Photo Point 2 View east No gopher occupancy recorded or expected due to lack of suitable habitat and lack of continuity with occupied habitat, same as at Photo Point 1. Areas where vegetation is less disturbed are forested.	

Photo Point and Plot Area 3

Location: North side of Steilacoom road adjacent to developed athletic fields; Plot area is grassy strip between sidewalk and road, approximately 10 meters long

Soil Conditions: Patches of gravelly sandy loam and patches of compacted gravel fill soils

Forb Cover: 80% / Dominant plants: *Trifolium repens*; *Hypochaeris radicata*; *Stellaria media*; *Taraxacum officinale*; *Plantago lanceolata*

Grass Cover: 40% / Dominant plants: *Agrostis sp.; Digitalis sp.*

Vegetation Management: mowed regularly, vegetation less than 2 inches high, had grown to 6 inches high by May 8

Gopher occupancy: Gopher mounds have been recorded on this side of the road by others in 2013 and 2014

Habitat continuity: A larger patch of gopher habitat is present on the south side of Steilacoom Road

View north

View east

Photo Point and Plot Area 4

Plots 4 through 7 are approximately 10 m x 10 m in size

Location: Near intersection of Steilacoom Road and Marvin Road, south side of Steilacoom Road

Soil Conditions: 0-4" loam; >4" compacted pea gravel and loam

Forb Cover: 60% / Dominant plants: Hypochaeris radicata; Rumex acetosella; Plantago lanceolata; Daucus carota

Grass Cover: 40% / Dominant plants: sparse bunch grasses*; Digitalis sp.*

Other Vegetation: mosses; *Mahonia aquifolium*

Vegetation Management: mowed regularly, vegetation less than 4 inches high in March, grown to 12 inches in May

Gopher occupancy: Gopher mounds were observed in this area on May 8, 2017, though soil conditions are poor due to compacted fill present

Habitat continuity: Contiguous with habitat area south of Steilacoom Road

View north

View west

Photo Point and Plot Area 5

Location: South side of Steilacoom Road

Soil Conditions: loamy sand 0-16" deep; with some gravel 0-3" deep

Forb Cover: 30% / Dominant plants: Hypochaeris radicata; Rumex acetosella; Daucus carota; Vicia sp.; Taraxacum officinale

Grass Cover: 100% / Dominant plants: *Agrostis sp.; Dactylis glomerata*

Other Vegetation: Cytisus scoparius; Symphoricarpos albus; Rubus ursinus; Pteridium aquifolium; snowberry borders the road in this area

Vegetation Management: mowed regularly, vegetation is approximately 5 inches high in March, 12 inches high in May

Gopher occupancy: Gopher mounds have been recorded in this area

Habitat continuity: Contiguous with habitat area south of Steilacoom Road

View east

View west

Photo Point and Plot Area 6

Location: South of road improvements project in area where Oregon oak seedlings will be planted to mitigate for young tree loss elsewhere on project site Soil Conditions: loamy sand **Forb Cover:** 5% / Dominant plants: Leucanthemum vulgare; Stellaria media; Vicia sp.; Cirsium vulgare **Grass Cover:** 30% / Dominant plants: *Dactylis glomerata* **Other Vegetation:** mosses; Mahonia aquifolium; Symphoricarpus albus Vegetation Management: mowed regularly **Gopher occupancy:** No gopher mounds have been recorded in this area **Habitat continuity:** Contiguous with habitat area south of Steilacoom Road	 View east  View west

Photo Point and Plot Area 7: Photos and data from May 8, 2017

Location: South side of Steilacoom Road, west of River Ridge Covenant Church

Soil Conditions: gravel and loamy sand 0-6"; >6" compacted gravel

Forb Cover: 80% / Dominant plants: Hypochaeris radicata; Rumex acetosella; Taraxacum officinale

Grass Cover: 80% / Dominant plants: *Agrostis sp.*

Other Vegetation: pine trees will be removed during project construction

Vegetation Management: mowed regularly

Gopher occupancy: Gopher mounds recorded in this area by others in 2014

Habitat continuity: Contiguous with habitat area south of Steilacoom Road

View east

View south

View west

Marvin-Mullen Road

The project site is relatively flat with slopes less than 3%. Soils formed in glacial outwash include Nisqually loamy fine sand, 0 to 3% slopes.

Land use in the vicinity of the project site includes low density residential and agriculture. An electrical substation is located at the northwest corner of the intersection (see Figure 3).

Vegetation communities present on the project site include mowed lawn and hay field areas, shrub thickets, and forest patches. Plant species observed on or adjacent to the project site are listed in Table 1.

Habitat conditions in each of the four corners of the intersection were characterized and described during a field survey conducted on July 10, 2017. Figure 4, "Survey Areas at the Project Site", shows the photo point locations and habitat areas that were evaluated on the project site. Habitat descriptions for each area and representative photos follow Figure 4. Gopher mounds have been observed in the project site north of Mullen Road.

Table 1. Plant Species recorded at the Marvin-Mullen Road Project Site

Species Name	**Common Name**
Achillea millefolium	Yarrow
Agrostis sp.	Bentgrass
Anthoxanthum odoratum	Sweet vernal grass
Bromus sp.	Brome grass
Cytisus scoparius	Scot's broom
Dactylis glomerata	Orchard grass
Daucus carota	Queen Anne's lace
Festuca rubra	Red fescue
Holcus lanatus	Velvetgrass
Hypochaeris radicata	Hairy cat's ear
Leucanthemum vulgare	Oxeye daisy
Medicago lupulina	Black medic
Oelmeria cerasiformis	Osoberry
Plantago lanceolata	Narrowleaf plantain
Polystichum munitum	Sword fern
Pseudotsuga menziesii	Douglas-fir
Pteridium aquifolium	Bracken fern
Quercus garryana	Oregon white oak
Rubus parviflorus	Thimbleberry
Rubus ursinus	Trailing blackberry
Symphoricarpos albus	Snowberry
Tanacetum vulgare	Tansy
Taraxacum officinale	Dandelion
Trifolium pratense	Red clover
Trifolium repens	White clover

Figure 10. Survey Areas at the Marvin-Mullen Road Project Site

Area 1. In this area northwest of the Marvin-Mullen Road intersection habitat is limited to grassy roadside areas between the substation and Marvin Road.

In grass strips, forb cover ranges from 10% to 60%
Forb species present – Dandelion, white clover, red clover, black medic, Queen Anne's lace

In grass strips, grass cover is approximately 90%
Grass species present – sweet vernal grass, brome grass, bentgrass, velvetgrass

View north of Area 1.

View east of Marvin Road and Area 2.

View south of Area 1 and intersection.

View west of substation.

Area 2. This area northeast of the Marvin-Mullen Road intersection is an active hay field dominated by a variety of grasses and forbs. Shrubs are present near Mullen Road.

Forb cover ranges from 10% to 80%
Forb species present - Queen Anne's lace, hairy cats ear, yarrow, dandelion, red clover, plantain

Grass cover ranges from 80% to 90%
Grass species present - sweet vernal grass, brome grass, bentgrass, velvetgrass, red fescue, orchard grass

Shrubs near Mullen Road - trailing blackberry, thimbleberry, snowberry, Scots broom

View north of Area 2.

View east of Area 2.

View south of Area 2 and Mullen Road.

View west of Area 2 and intersection.

Area 3. This area southeast of the Marvin-Mullen Road intersection encompasses mowed grass areas as well as dense shrubs and forest.

In grassy areas, forb cover ranges from 80% to 95%
Forb species present - red clover, white clover, plantain, hairy cat's ear, oxeye daisy, Queen Anne's lace, yarrow, tansy, dandelion

In grassy areas, grass cover ranges from 80% to 90%
Grass species present - sweet vernal grass, brome grass, bentgrass, velvetgrass, red fescue, orchard grass

Species present in shrub and forest areas – snowberry, trailing blackberry, bracken fern, Douglas-fir, osoberry, sword fern, Oregon white oak

View north of dense shrubs along Mullen Road in Area 3

View east of Area 3 includes mowed grass and forbs, Douglas-fir, and oak tree

View south of Area 3

View west of Area 3

Area 4. This area southwest of the Marvin-Mullen Road intersection is mostly vegetated by dense shrubs and trees, with the exception of the maintained roadside.

In the grassy roadside area, forb cover is approximately 10%
Forbs species present - white clover, plantain, red clover, yarrow

In the grassy roadside area, grass cover is approximately 75%
Grass species present – bentgrass, orchard grass

Shrub species present include Douglas spirea, Scot's broom, trailing blackberry, and others

View north of Mullen Road and the substation

View east of the intersection from Area 4

View south of dense shrubs in Area 4

View west along road corridor in Area 4.

Covered Species

The Applicant proposes to cover take of the Yelm pocket gopher that may occur incidental to activities related to the otherwise lawful construction of the proposed road safety improvement projects.

Status and Distribution

On April 9, 2014, the Service published a final rule in the Federal Register listing the Yelm pocket gopher as threatened throughout their range in the State of Washington (79 FR 19760; April 9, 2014) (USFWS 2014a). The Service also published a final rule designating critical habitat for the Yelm pocket gopher (79 FR 19712; April 9, 2014) (USFWS 2014b). The project sites are not located on land designated as critical habitat (see Figure 5 "Yelm Pocket Gopher Service Areas and Reserve Priority Areas."

Yelm pocket gopher are found on grassland habitats, including remnant and degraded prairies, in Thurston County. The approximate range of the Yelm pocket gopher is shown in Figure 5 "Yelm Pocket Gopher Service Areas and Reserve Priority Areas." Their range has been divided into three geographic Service Areas to recognize possible differences between subpopulations within the range of this subspecies. Reserve Priority Areas have been identified as areas with higher habitat value and restoration potential by USFWS to aid in recovery planning. The project sites are not located in Reserve Priority Areas.

Yelm pocket gophers are known today from several locations throughout Thurston County, including the Baker, Mound, Rock, Ruth, Frost, Violet, Yelm, Chambers, Barnard's, Hawk's, and Tenalquot Prairies. They occur most commonly on sites mapped as having Alderwood, Cagey, Everett, Godfrey, Indianola, Kapowsin, McKenna, Nisqually, Norma, Spanaway, Spanaway-Nisqually complex, and Yelm soils (79 FR 19728).

Prairie habitat that provides habitat for Yelm pocket gophers has been lost, degraded, and fragmented in recent times (approximately 1890 to the present time) due to urban development, conversion to other uses, and ingrowth of woody vegetation (USFWS 2014a). Many surviving subpopulations are likely small and appear to be isolated from other subpopulations, although there are few data on dispersal to help delineate genetically connected populations. Small subpopulations are unlikely to persist for long without at least occasional demographic and genetic recharge by dispersing individuals from other nearby subpopulations. Re-colonization becomes less likely as habitat is fragmented and populations become isolated.

Life History and Ecology

Yelm pocket gophers spend most of their time within their system of burrows. Gophers are believed to be generally solitary and exclude other gophers from their burrows except when breeding and when females have litters. When pocket gophers have established a territory, they generally remain there, although they can shift their home range in response to seasonally wet soils. Pocket gopher territory sizes (i.e., burrow systems) vary, likely in response to habitat quality, reproductive status (Stinson 2013), and stochastic factors.

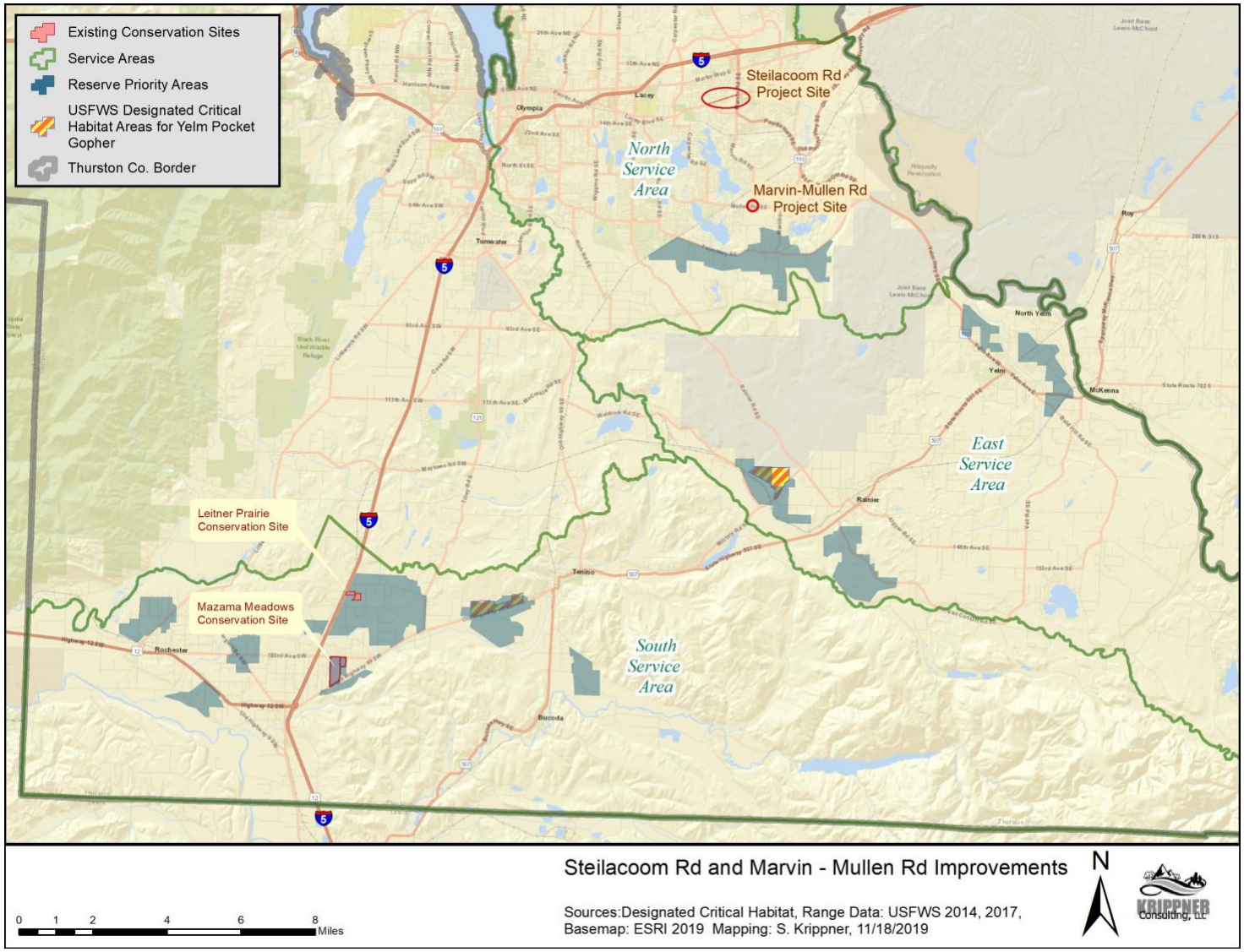


Figure 11. Yelm Pocket Gopher Service Areas and Reserve Priority Areas

Yelm pocket gophers attain sexual maturity by the breeding season after their birth, when approximately 9 months old and rear a single litter of about 5 (2-7) pups per year (Witmer et al. 1996, Verts and Carraway 2000). Gopher populations can increase dramatically in the summer after the dispersal of young of the year and may increase to three to four times the spring adult population. In addition to this annual influx of young-of-the-year, gopher populations also fluctuate year-to-year due to environmental conditions.

Pocket gophers have been called 'keystone species' and 'ecosystem engineers' because they affect the presence and abundance of plants and other animals (Vaughan 1961, 1974; Reichman and Seabloom 2002). Their extensive excavations affect soil structure and chemistry; food caches and latrines enrich the soil, affecting plant community composition and productivity. Yelm pocket gophers are also an important prey species for many predators, including hawks, owls, coyotes, and weasels; and their burrows provide retreats for salamanders, western toads, frogs, lizards, small mammals, and invertebrates (Stinson 2005).

Habitat Characteristics and Use

Yelm pocket gophers live on open meadows, prairies and grassland habitats of the glacial outwash plain where there are porous, well-drained soils (Dalquest 1948). They can live in a wide range of grasslands, including pastures and agricultural lands.

Yelm pocket gophers forage on a wide variety of plant material, including leafy vegetation, roots, shoots, and tubers (USFWS 2014a). When succulent in summer months, perennial forbs are a preferred food over grasses, and fleshy roots and bulbs, such as camas (*Camasia* spp.) are important when green vegetation is not available. The availability of forbs may provide nutrients important for gopher growth and reproduction (Stinson 2013). Gophers also eat fungi and disseminate the spores of species that have an important role in facilitating plant growth (Stinson 2013).

At the landscape scale, the distribution of pocket gophers is greatly affected by soils. Soil characteristics that affect gophers include depth and texture, particularly rock and clay content that affects burrowing ability, permeability that can result in periodic flooding of burrows, and water-holding capacity and fertility that affect growth of plant foods. Pocket gophers generally prefer deep, light-textured, porous, well-drained soils, and do not occur in peat or heavy clay soils (Chase et al. 1982, Baker et al. 2003). They are seldom found in very rocky soil (Steinberg 1996, Olson 2011).

Yelm pocket gopher habitat in the south Puget Sound has been and continues to be lost to development, agriculture, and succession to forest. Most habitat that remains is fragmented and degraded by Scot's broom and other non-native plants. Frequent mowing and herbicide use may also degrade habitat. Direct threats include predation by cats and dogs and illegal trapping or poisoning. Habitat loss, fragmentation, degradation, and direct threats are likely to continue affecting gopher populations because Thurston County's population and associated residential and commercial development are projected to grow substantially in the next few decades (Sustainable Thurston 2011: A11).

Occurrence in the Permit Area

Yelm pocket gophers can be difficult to detect because they spend most of their lives underground, with the exception of very brief surface forays for feeding or for dispersal of young from their natal burrow systems (USFWS 2014a; Stinson 2013). Yelm pocket gophers are typically detected by searching potential habitat for the presence of gopher mounds indicating below-ground burrowing. Detection of mounds can verify presence of the species on a site but does not provide abundance or distribution data (Olson 2011). Within-site distribution is likely to change across years. Therefore, occupied habitat is considered to be the area of suitable soils with a common management history and cover type contiguous with the occupied area.

Steilacoom Road

Soil conditions present on the project site vary considerably depending upon the amount of gravel fill soils present and land use adjacent to the roadway. Soils on the site are mapped as Spanaway gravelly sandy loam, 0 to 3% slopes; Nisqually loamy fine sand, 3 to 15% slopes; and Norma silt loam (see Figure 12 "NRCS Soils"). These soil types are considered suitable for gophers (USFWS 2015). Suitable soils for gophers on the project site are present in school zone areas north and south of Steilacoom Road at the east end of the project site and they extend west along the south side of Steilacoom Road to Vine Maple Street SE (see Figure 13 "Habitat Impact Areas"). However, project site soils west of these areas have been disturbed by compaction, imported gravel, and high-density residential home development. Vegetation is limited to manicured lawn areas, dense shrubs, and areas landscaped with trees and shrubs that are isolated from each other by road cuts and fills; roadside drainage ditches; and the pavement of intersecting driveways and residential roads. No gopher occupancy has been observed in these areas and they contain very limited forage for gophers. For these reasons, no areas west of Vine Maple Street SE have been included in the calculation of habitat impacts for the Steilacoom Road project.

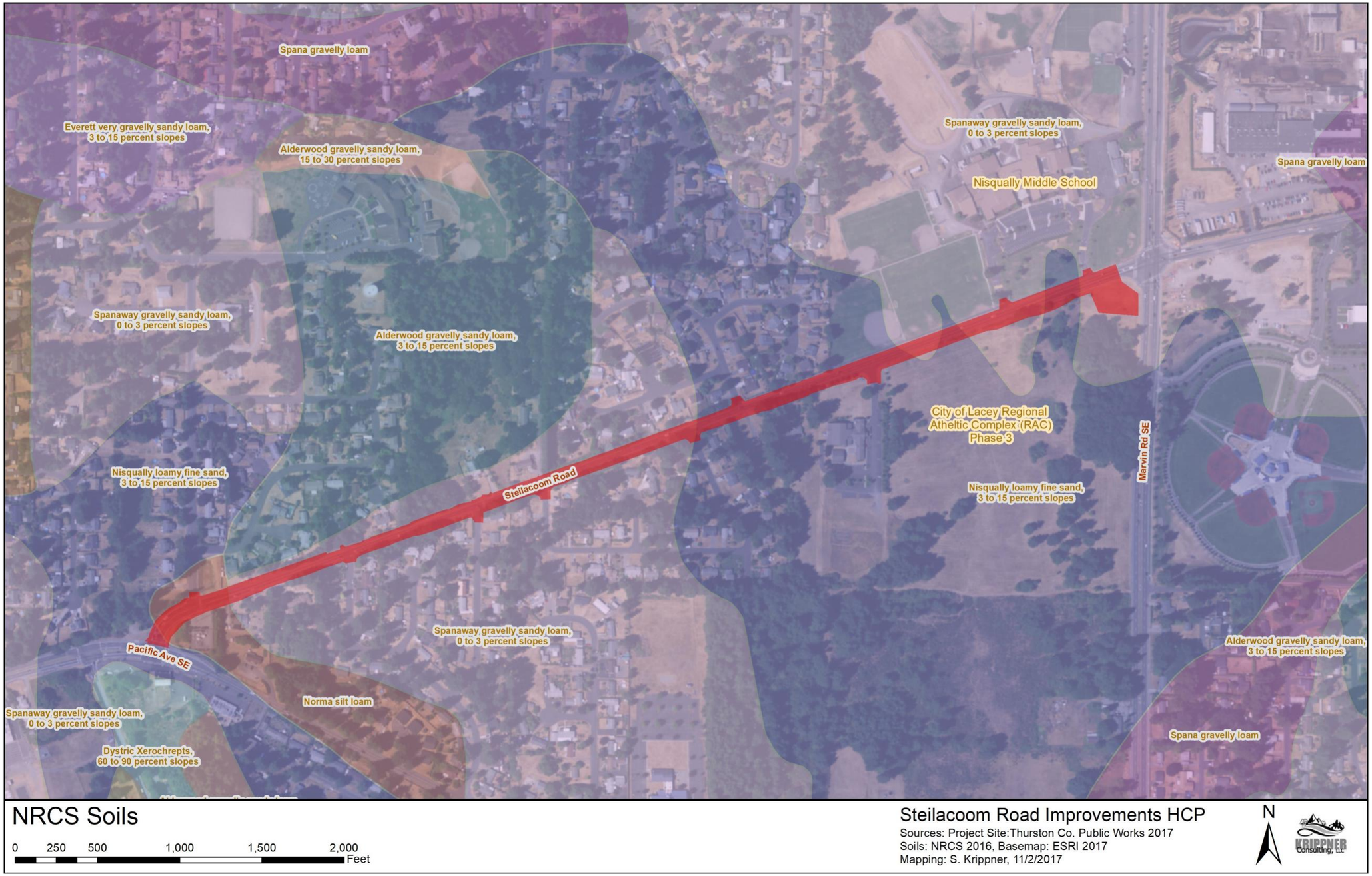


Figure 12. NRCS Soils at Steilacoom Road

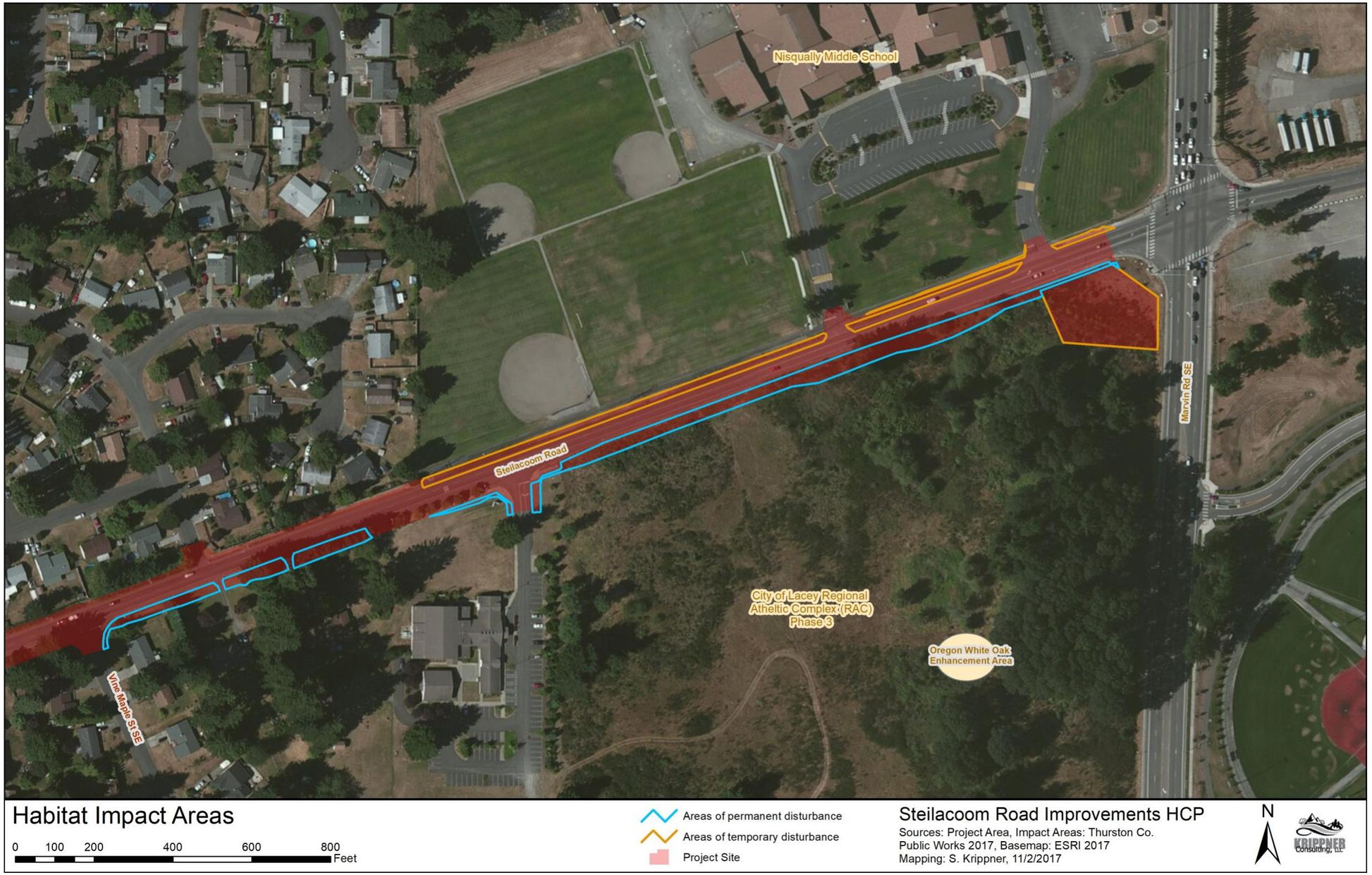


Figure 13. Steilacoom Road Habitat Impact Areas

Soils and vegetation east of Vine Maple Street south of Steilacoom Road and adjacent to Nisqually Middle School grounds north of Steilacoom Road contain patches of suitable soils and vegetation and are connected with a larger habitat patch, approximately 30 acres in size, south of Steilacoom Road. Gopher occupancy has been observed in these areas (See Appendix A: Reports by KES and CNLM). Habitat that will be impacted in these areas by project construction activities are shown in Figure 13 "Habitat Impact Areas". Soils north of Steilacoom Road include patches of compacted gravel and some areas with less compacted, gravelly sandy loam. South of Steilacoom Road the soils are compacted and gravelly near Marvin Road at the site of the proposed staging area, then they transition to loamy sand with some gravel from the staging area to Vine Maple Street. The vegetation community includes a mix of non-native grasses and weedy forbs (See Section on Environmental Setting and Biological Resources and Appendix B: Report by KES). Native prairie vegetation was limited to scattered prairie lupine, small patches of common camas, and one small patch with Douglas catchfly and small-flowered blue-eyed Mary south of Steilacoom Road.

Oregon white oak seedlings and saplings are also present in the project site corridor (See Appendix B – Reports by Thurston County Public Works and Sound Urban Forestry). Oak seedlings will be planted between two existing oak stands south of Steilacoom Road near Marvin Road in order to mitigate for the loss of oak seedlings and saplings during construction (see oak enhancement area in Figure 13 "Habitat Impact Areas"). The establishment of additional oak trees in this area is not expected to have a negative impact on gopher habitat because the root systems of existing oak trees are already present here; shrub thickets are also present, and forb cover (preferred gopher forage) is low in grassy patches between shrub and forest vegetation in this general area.

When construction is initiated on the east portion of the project site in suitable habitat areas, habitat will be lost along with any individuals. Incidental take is expected to be highest during initial site clearing, excavation and grading as these activities will extend below the ground and into burrow systems. Depending upon the depth of grading, excavation and compaction, project activities may also extend into natal nests and food caches. Burrow systems may be destroyed and individual animals harmed during these construction activities.

Take in the form of harm may occur during site clearing, excavation, and grading if equipment injures or kills individuals or if forage plants are removed and soils for burrow systems are removed or compacted.

Observing or documenting instances of take will be difficult or impossible because Yelm pocket gophers remain underground for most of their lives. The loss of suitable habitat on the project site will therefore serve as a surrogate for the amount of take anticipated over the term of the requested permit. Yelm pocket gopher habitat on the project site is likely to be lost due to development activities once the site has been developed and construction is complete.

A total of approximately 1.5 acres of Yelm pocket gopher habitat will be impacted by project activities (see Table 2, next page; Figure 13 "Habitat Impact Areas"; and Figures 6, 7, and 8 "Site Plan Drawings" - Sheets 3, 4, and 5). All of these areas have been recorded as being occupied by gophers, though gopher occupancy north of Steilacoom Road is likely to be low to none due to the higher level of development next to the established ball fields here. Suitable habitat conditions were not recorded in any other project site areas. Areas south of Steilacoom

Road from Vine Maple Street to the staging area will be impacted permanently because suitable habitat here will be converted from open field to expanded road, sidewalk, and bioswale. A mix of native soils and compost will be used for the bioswales and they will be seeded with an erosion control grass mix. Sidewalk and grassy habitat patches north of Steilacoom Road will be removed during construction, but then restored by using a mix of native soils and compost and seeding with an erosion control grass mix in the bioswales between the new road section and sidewalk. Site restoration will also occur at the staging area south of Steilacoom Road by removing the temporary quarry spalls and geofabric, de-compacting soils, and seeding with an erosion control grass mix.

Table 2. Steilacoom Road Habitat Impact Areas

Sheet #	Areas of permanent disturbance (square feet)	Location
3	3655	South side of Steilacoom Road from Vine Maple Street to Marvin Road
3	2467	
3	3266	
4	844	
4&5	22819	
Total	33051	
Sheet #	Areas of temporary disturbance and restoration (square feet)	Location
4	10338	North side of Steilacoom Road adjacent to developed athletic fields
4	636	
5	866	
5	21802	Staging area, southwest corner of Steilacoom Road and Marvin Road
Total	33642	

A total of approximately 1.5 acres of Yelm pocket gopher habitat will be impacted by project activities. The Applicant is mitigating this loss with the acquisition of 2 acres of mitigation from a USFWS-approved conservation site that is occupied by the Yelm pocket gopher to fully offset the impacts of the taking expected to occur at the project site.

Marvin-Mullen Road

Soil conditions present on the project site are conducive to pocket gopher burrowing and gopher mounds have been observed in project site areas north of Mullen Road. Soils on the project site are mapped as Nisqually loamy fine sand. Forage plants for gophers including a diversity of forbs and grasses are also found on the project site outside of paved and graveled areas. However, south of Mullen Road patches of forest and shrub vegetation likely limit food resources and woody root systems may make burrowing difficult in these areas.

When construction is initiated on the project site in suitable habitat areas, habitat will be lost along with any individuals. Incidental take is expected to be highest during initial site clearing, excavation and grading as these activities will extend below the ground and into burrow systems. Depending upon the depth of grading, excavation and compaction, project activities may also extend into natal nests and food caches. Burrow systems may be destroyed, and individual animals harmed during these construction activities.

Take in the form of harm may occur during site clearing, excavation, and grading if equipment injures or kills individuals or if forage plants are removed and soils for burrow systems are removed or compacted.

Observing or documenting instances of take will be difficult or impossible because Yelm pocket gophers remain underground for most of their lives. The loss of suitable habitat on the project site will therefore serve as a surrogate for the amount of take anticipated over the term of the requested permit. Yelm pocket gopher habitat on the project site is likely to be lost due to development activities once the site has been developed and construction is complete.

Project site areas north of Mullen Road have been documented as being occupied by gophers and project site areas south of Mullen Road have suitable soils and enough forage vegetation available that they may be occupied at the time of construction. While it is unlikely that gopher burrow systems extend below shrub and forest areas south of Mullen Road, these areas were not excluded because it is possible for deeper tunnels to extend into suitable soils in these areas given their close proximity to suitable foraging habitat. Therefore, all project site areas outside of paved areas are assumed to be potential impact areas for incidental take of gophers.

A total of approximately 1.42 acres of Yelm pocket gopher habitat will be impacted by project activities (see Figure 3 “Marvin-Mullen Road Project Site” for the impacted area outside of paved areas). The Applicant is mitigating this loss with the acquisition of 2 acres of mitigation from a USFWS-approved conservation site that is occupied by the Yelm pocket gopher to fully offset the impacts of the taking expected to occur at the project site.

Conservation Program

The Conservation Program describes the Applicant's proposed actions and commitments to conserve the Covered Species. In accordance with USFWS guidance for development of HCPs (USFWS and NMFS 2016), the conservation program consists of six components:

1. Biological Goals

2. Biological Objectives

3. Minimization Measures

4. Mitigation Measures

5. Monitoring Plan

6. Adaptive Management Plan

1. Biological Goals

Biological goals are intended to be broad, guiding principles that clarify the purpose and direction of the Applicant's HCP (USFWS and NMFS 2016). These biological goals describe what the conservation plan aims to accomplish over the course of the permit term for the species covered by the plan. The biological goals are intended to address specific threats to the Yelm pocket gopher cited in the USFWS listing rule for this species (79 FR 19760-19796), and describe how the Conservation Plan will mitigate for unavoidable effects.

The Applicant will contribute to the conservation of the Yelm pocket gopher by acquiring 4 acres of mitigation from a USFWS-approved conservation site that is occupied by the Yelm pocket gopher to fully offset the impacts of the taking expected to occur at the project sites.

2. Biological Objectives

Biological objectives describe measurable performance targets useful for evaluating progress towards achieving the plan's biological goals. Objectives provide benchmarks for determining the effectiveness of the conservation program and inform effective adaptive management over the duration of the permit. Biological objectives for this HCP are contained within the permit documents that have been approved by USFWS for the conservation site.

3. Minimization Measures

The Applicant has minimized the project impact areas to the extent possible for road and pedestrian safety improvements and will implement the following measures to minimize impacts to the Covered Species at the project site.

1. Project areas will be accessed from existing developed areas including paved roads, gravel road shoulders, and parking lots.

2. Staging of construction materials will be restricted to a designated staging area and to existing developed areas including paved roads, gravel road shoulders, and parking lots.

3. Other minimization measures, such as using tracked vehicles to reduce soil compaction, may also be used during construction.

4. Mitigation Measures

This HCP provides mitigation measures intended to rectify, reduce, and compensate for the impacts of the unavoidable incidental taking associated with the Covered Activities. The mitigation proposal is the acquisition of 4 acres of suitable habitat that is perpetually dedicated to the management and conservation of the Yelm pocket gopher at a USFWS-approved conservation site.

Steilacoom Road

The staging area for the Steilacoom Road project site will be restored following construction by de-compacting soils and seeding with an erosion control grass mix. Storm water bioswales in habitat areas on the east portion of the project site will be created using native soils mixed with compost and will be seeded with an erosion control grass mix.

Marvin-Mullen Road

At the Marvin-Mullen Road project site, native, onsite soils mixed with compost for infiltration and treatment capacity will be used to construct stormwater infiltration and treatment facilities. The side slopes of the facilities will be seeded with an erosion control grass mix.

5. Monitoring

USFWS determined that monitoring is essential to determining and documenting the success of conservation programs (50 CFR 17.32) and informing adaptive management efforts. Monitoring requirements have been approved and permitted by USFWS for the conservation site. Compliance monitoring for this project includes providing documentation to USFWS that describes when offsite mitigation is formally dedicated to this project, the status of onsite mitigation measures, and the project completion date.

Adaptive Management Strategy

The U.S. Department of the Interior defines adaptive management as a structured approach to decision making in the face of uncertainty that makes use of the experience of management and the results of research in an embedded feedback loop of monitoring, evaluation, and adjustments in management strategies (Williams et al. 2009). Uncertainties may include a lack of biological information for the Covered Species, a lack of knowledge about the effectiveness of mitigation or management techniques, or doubt about the anticipated effects of the Projects. Adaptive management is a required component of HCPs that allows for the incorporation of new information into conservation and mitigation measures during HCP implementation. Effective implementation of this approach requires explicit and measurable objectives, and identifies what actions are to be taken and when they are to occur. Adaptive management measures do not generally trigger the need for a permit amendment because the changes are intended to better achieve the existing biological goals based on new scientific or technical information, and would not result in an increase in the amount, duration, or extent of take of covered species

Adaptive management is being used at the conservation site in conjunction with site monitoring to adjust and improve management techniques as site conditions change over time and as new information on the Covered Species and their management becomes available. Adaptive management strategies for the conservation site are further described in the permit documents approved by USFWS for this site.

Reporting

An Annual Report describing Covered Activities for each of the project sites will be prepared by the Applicant and submitted to the USFWS Washington Fish and Wildlife Office in Lacey, Washington no later than February 1 each year for the duration of the permit, or until the year the safety and infrastructure improvement project is completed, whichever comes first.

The report will summarize the following information:

- The development status of the project sites.
- The Applicant's anticipated development timeline for the project sites (if known).
- The date on which construction of the projects is completed.
- On the first annual report date following completion of development at each of the project sites, the Applicant will describe the site as "completed" or "fully developed". No annual report for the completed project will be due following this final year.

Changed Circumstances

Changed circumstances for the conservation site must be addressed in perpetuity in accordance with permit documents for this site. These changed circumstances include natural events such as fire, flood, climate change, earthquake, new species invasions, or disease; the listing of other species within the plan area that may be affected by Covered Activities or other events that could affect the Land Manager's ability to meet the biological goals and objectives of the conservation site. To address any changed circumstances, the Land Manager of the conservation site will alter or adapt site management actions using best available science to promote the continued goals and objectives of habitat conservation for the Covered Species. If any do occur, USFWS will be consulted to adjust minimization or mitigation measures to address these circumstances. Site management actions will be altered/adapted using best available science to promote the continued goals and objectives of habitat conservation for the Covered Species. Any costs of these activities will be covered by the owner of the conservation site as part of ongoing management of the site as described in USFWS-approved permit documents.

Changed circumstances are not anticipated to affect the scale of impacts or minimization measures at the project sites.

Unforeseen Circumstances

Unforeseen circumstances include circumstances that were not anticipated by the Applicant or USFWS during the preparation of the HCP that result in a substantial and adverse change in the status of the Covered Species. Unforeseen Circumstances are defined by Federal regulation (50 CFR §17.3) as "changes in circumstances affecting a species or geographic area covered by a conservation plan or agreement that could not reasonably have been anticipated by plan or agreement developers and the USFWS at the time of the conservation plan's or agreement's negotiation and development, and that result in a substantial and adverse change in the status of the Covered Species."

USFWS bears the burden of demonstrating that Unforeseen Circumstances exist, using the best scientific and commercial data available. If an Unforeseen Circumstance occurs during the term of the HCP, and if USFWS determines that additional conservation and mitigation measures are necessary to respond to such Unforeseen Circumstances, then USFWS may require more conservation measures of the Permittee, but only if such measures are limited to modifications within conserved habitat areas, if any, or the HCP's operating conservation program for the affected species, and if such measures maintain the original terms of the HCP to the maximum extent possible.

Notwithstanding the foregoing paragraph:

1. USFWS will clearly document any findings of Unforeseen Circumstances. In determining whether any event constitutes an unforeseen circumstance, USFWS will consider, but not be limited to, the following factors: 1) the extent of the current range of affected species, 2) percentage of range adversely affected by the HCP, 3) the percentage of range of the affected species conserved by the HCP, 4) the ecological significance of that portion of the range affected by the HCP, 5) the level of knowledge about the affected species and habitat and the degree of specificity of the species' conservation program under the HCP, and 6) whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

2. USFWS will not require the commitment of additional land, water, or financial compensation without the consent of the Applicant or impose additional restrictions on the use of land, water, or natural resources otherwise available for use by the Applicant under the original terms of the HCP, including additional restrictions on covered actions that are permitted under the HCP.

3. Nothing in this HCP will be construed to limit or constrain USFWS or any other governmental agency from taking additional actions at its own expense to protect or conserve a species included in the HCP. Nothing in this agreement allows the Federal government or any other party to take either any portion of this property without property owner agreement.

In the event of Unforeseen Circumstances USFWS will provide written notice (except where there is substantial threat of imminent, significant adverse impacts to a Covered Species) to the Applicant with a detailed statement of the facts regarding the unforeseen circumstance involved, the anticipated impact(s) to the Covered Species and their habitat(s), and all information and data that supports the assertion. In addition, the notice will include any proposed conservation measure(s) that is believed would address the Unforeseen Circumstance, an estimate of the cost of implementing such conservation measure(s), and the likely effects upon the Applicant. No additional cost may be required of the of the Applicant or property owner should additional measures need to the implemented.

Evaluation of Unforeseen Circumstances

During the period necessary to determine the nature and location of additional or modified mitigation, the USFWS may perform an analysis of the Covered Species or its habitat. The Applicants may submit additional information to the USFWS. The USFWS may use requested or provided information to propose modifications or redirection of existing conservation measures.

The "No Surprises" Regulations

The USFWS "No Surprises" regulations (69 FR 71723) states that if the Applicant is properly implementing an HCP that has been approved by USFWS, no additional commitment of resources beyond that already specified in the plan will be required. "Properly implemented conservation plan" means any HCP and permit whose commitments and provisions have been and are being fully implemented by the Applicant and in which the Applicant is in full compliance with the terms and conditions of the permit, so the HCP is consistent with the agreed-upon operating conservation program for the project. A properly-implemented conservation plan for the HCP includes implementation of all elements of the conservation plan, including the Adaptive Management, Monitoring Program, and responses to Changed Circumstances.

The Applicant understands that No Surprises assurances are contingent on the proper implementation of the ITP and the HCP. The Applicant also understands that USFWS may suspend or revoke the Federal permit, in whole or in part, in accordance with Federal regulations (50 CFR Section 13.27 and 13.28 and other applicable laws and regulations) in force at the time of such suspension if the Applicant fails to comply with the agreement.

Funding Assurances

The Applicant will secure 2 acres of mitigation from a conservation site that is approved by USFWS for mitigating impacts to the Yelm pocket gopher for each of the projects, or a total of 4 acres of mitigation for both sites, before any project activities begin at either site. Mitigation acres may be actual acres at a conservation site owned by an approved HCP/ITP Permit Holder or they may be functional-acres at an approved conservation bank site. In either case, an out of service area mitigation ratio of 1:1.25 is used because purchase is anticipated to be outside of the Primary Service Area. The project sites are located in Yelm pocket gopher Service Area North

and the conservation site is likely to be located in Yelm pocket gopher Service Area South. Because perpetual operation and maintenance remains the obligation of the owner of the conservation site, and because financial arrangements providing for these ongoing activities will be completed before project activities begin, the Applicant believes that they will have fulfilled the financial assurances required to meet permit issuance criteria by the time that project activities start at either site.

Alternatives to the Taking the Applicant Considered

An HCP is required to describe "what alternative actions to such taking the applicant considered and the reasons why such alternatives are not being utilized" (ESA §10(a)(2)(A)(iii)).

Steilacoom Road

The only alternative that would completely avoid impacts to the Covered Species or their habitats would be to choose not to construct the proposed safety improvement project at Steilacoom Road. The Applicant has decided not to forego development of the site because this project is a necessary public safety improvement project anticipated to be funded by the Transportation Improvement Board (TIB).

Marvin-Mullen Road

The only alternative that would completely avoid impacts to the Covered Species or their habitats would be to choose not to construct the proposed infrastructure improvements. The Applicant has decided not to forego development of the site because this project is necessary for improving traffic flow and public safety at the Marvin Road and Mullen Road T-intersection.

Such Other Measures that the Secretary May Require

Permit Amendments

It may be necessary at some time over the duration of the proposed permit for the USFWS and the Applicant to clarify provisions of the HCP or the requested ITP with respect to program implementation or the meaning and intent of language contained in these documents. Such clarifications should not change the substantive provisions of any of the documents in any way, but merely clarify and make more precise the existing provisions.

In addition, it may be necessary to make administrative changes or minor modifications to the documents at some time over the duration of the proposed permit. Such changes should not result in substantive changes to any provisions of the documents, but may be necessary or convenient to represent the overall intent of the Applicant and the USFWS. Examples of such administrative changes or minor modifications include correction of typographic errors in the documents, changes in the legal business name or mailing address of a permittee, or clarification of reporting procedures. Requests for administrative changes and minor modifications must be

received in writing and may be reviewed and approved by the USFWS Regional Office or by the State USFWS Ecological Services Office in accordance with applicable regulations and policies (50 CFR 13).

Except as provided for above, the HCP and the ITP may not be amended or modified in any way without the written approval of the Applicant and the USFWS. Major amendments to the HCP or the ITP would be required for changes in location, covered activity, type or amount of take, or covered species. Examples of changes requiring major amendments to the documents include the listing of a species not currently addressed in the HCP that may be affected by the Covered Activities; the modification of any Covered Activity, minimization, or mitigation measure under the HCP, including funding, that may affect the type or amount of take, the effects of the Covered Activities, or the nature or scope of the minimization or mitigation measures in a manner or to an extent not previously considered in issuing the ITP; or any other modification of the Covered Activities that causes an effect to the Covered Species or their designated critical habitat not considered in the original ITP.

Such major amendments will be processed by the USWFS in accordance with the provisions of the ESA, the applicable regulations (50 CFR 13 and 17), and will be subject to the appropriate level of environmental review under the provisions of NEPA.

Permit Suspension/Revocation

The USFWS may suspend or revoke their respective permits if the Applicant fails to implement the HCP in accordance with the terms and conditions of the permits or if suspension or revocation is otherwise required by law. The USFWS may suspend or revoke the Section 10(a)(1)(B) permit, in whole or in part, in accordance with the ESA, associated implementing regulations, or other applicable laws and regulations in force at the time of such suspension or revocation.

Permit Renewal

If unanticipated construction delays or other delays preclude completion of the project during the requested duration of the ITP, the Applicant may need to submit a formal request to USFWS to renew the permit.

Upon expiration, a Section 10(a)(1)(B) permit may be renewed, provided that the issued permit is renewable, and that biological circumstances and other pertinent factors affecting Covered Species are not significantly different than those described in the original HCP. To renew the permit, the Applicant shall submit to the Service, in writing:

- a request to renew the permit; reference to the original permit number;
- certification that all statements and information provided in the original HCP and permit application, together with any approved HCP amendments, are still true and correct, any changes to the original information must be listed and described clearly;
- a description of any take that has occurred under the existing permit; and
- a description of any portions of the project still to be completed, if applicable, or what activities under the original permit the renewal is intended to cover.

If upon review of current environmental baseline and status of the species information and consideration of the future proposal the Service concurs with the information provided in the request, it shall renew the permit consistent with permit renewal procedures required by Federal regulation (50 CFR 13.22). If the Applicant fails to file a renewal request within 30 days prior to permit expiration, the permit shall become invalid upon expiration.

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Appendix A - Background Project Reports for Steilacoom Road

Prairie Habitat Critical Area Reconnaissance, Key Environmental Solutions, LLC (KES), 2013

Prairie Habitat Assessment Methodology, Center for Natural Lands Management (CNLM), 2014

Impacted Trees, Sound Urban Forestry, LLC, 2014

Impacts to Oregon White Oak Woodlands, Thurston County Public Works, 2015

Key Environmental Solutions, LLC.

November 8, 2013

Thurston County Public Works
Attn: Jeanne Kinney, Environmental Coordinator
9605 Tilley Road SW
Olympia, WA 98512

Re: Pacific Avenue to SR 510 Improvement Project, Prairie Habitat Critical Area Recon, Thurston County, Located off Steilacoom Road SE between Pacific Avenue and SR 510 , Lacey, Washington, Section 14, Township 18 North, Range 1 West, W.M., and in accordance with *Thurston County Critical Areas Ordinance Title 24.03 (Definitions), Interim Prairie Ordinance 14542, WDFW Management Recommendations for Washington Priority Habitats Oregon White Oak Woodlands and WDFW Habitat Management Recommendations for the Mazama Pocket Gophers.*

Dear Mrs. Kinney,

Key Environmental Solutions, LLC. (KES) has completed a Prairie Habitat and Mazama Pocket Gopher Recon on the above referenced project located along Bald Hills Road between Smith Prairie Road and Longmire Road, Thurston County, Washington. Fieldwork and site visits for the Bald Hills Road project were conducted on October 20, 2013.

Project Description and Findings

The project site is 40 feet from centerline on either side of the road along Steilacoom Road SE between Pacific Avenue and SR 510. The project section was approximately 0.8miles. Steilacoom Road SE is very well-used and the county frequently maintains their road right-of-way. The entire 0.8 mile section (both sides) of Steilacoom Road SE was reviewed for prairie habitat and oaks. The current project proposal will widen and rehabilitate the pavement providing two 11 foot lanes, a 5 foot wide bike lane, 6 foot wide sidewalks and an auxiliary turn lanes along the middle school and the planned third phase of the Regional Athletic Complex. The improvements will also include curbs, gutters, planter strips, landscaping and stormwater facilities that emphasize low impact development methods.

The project area was required to be reviewed due to the presence of prairie soils. KES reviewed the Natural Resource Conservation Service Soils (NRCS) maps and verified that prairie soils did exist along the project area (please see NRCS soil map).

KES, WDFW and Thurston County Public Works observed and documented evidence of Mazama Pocket Gopher Mounds in front of the River Ridge Covenant Church and the Nisqually

Middle School. A complete Mazama Pocket Gopher Survey and Habitat Management Plan (HMP) will be required for this area of the project.

There were no other gopher mounds found in the project area.

There were numerous oak trees found to occur within the project area. The larger more dense stands of oaks were located outside of the road right-of-way. The oak stands outside of the project area did meet the *TCC Prairie Ordinance 14542, WDFW Management Recommendations for Washington Priority Habitats Oregon White Oak Woodlands and WDFW Habitat Management Recommendations for the Mazama Pocket Gophers* for "Oak Habitat." The only area that is within the project area that meets the definition for "Oak Habitat" is at the corner of Marvin Road and Steilacoom Road SE. Thurston County Public Works have already acknowledged that this "Oak Habitat" will not be impacted.

Other oaks within the project area do not meet *TCC Prairie Ordinance 14542, WDFW Management Recommendations for Washington Priority Habitats Oregon White Oak Woodlands and WDFW Habitat Management Recommendations for the Mazama Pocket Gophers.* Thurston County Public Works will try to avoid any oaks in the project area and are prepared to mitigate for any potential impacts.

Some of the vegetation that occurred along both sections of road included: various landscaping plants, variety of orchard trees, variety of grasses, Indian plum *(Oemleria cerasiformis-FACU),* snowberry *(Symphoricarpos albus-FACU),* sheep sorrel *(Rumex acetosella-FACU),* common dandelion *(Taraxacum officinale-FACU),* white clover *(Trifolium repens-FAC)* Douglas fir *(Pseudotsuga menziesii-FACU),* thimbleberrry *(Rubus parviflourus-FAC),* Scotch broom *(Cytisus scoparius-FACU),* Bracken fern *(Pteridium aquilinum-FACU), Himalayan blackberry (Rubus armenicus-FACU),* field pennycress *(Thlaspi arvense-FACU),* vine maple *(Acer circinatum-FAC)* common vetch *(Vicia sativa-UPL),* beaked hazelnut *(Corylus cornuta-FACU),* Western red cedar *(Thuja plicata-FAC),* Oueen Anne's lace *(Daucus carota-FACU),* yarrow *(Achillea millefolium-FACU)* Evergreen blackberry *(Rubus lactaintus-FACU),* red alder *(Alnus rubra-FAC),* red huckleberry *(Vaccinium parvifolium-FACU),* salal *(Gaultheria shallon-FACU),* birdsfoot trefoil *(Lotus corniculatus-FAC),* Oregon ash *(Fraxinus latifolia-FACW),* Nootka rose *(Rosa nutkana-FACW),* Reeds canarygrass *(Phalaris arundinacea-FACW),* pearly everlasting *(Anaphalis margaritacea-FACU),* bedstraw *(Galium aparine-FACU),* ribbed plantain *(Plantago lanceolata-FACU),* pepper grass *(Lepidium densiflorum-UPL),* creeping buttercup *(Ranunculus repens-FACW),* Sword fern *(Polystichum munitum-FACU),* Oregon white oak *(Quercus garryana-NI),* Pacific madrona *(Arbutus menziesii-NI),* hooker willow *(Salix hookerina-FACW),* Pacific ninebark *(Physocarpus capitatue-FACW),* hardhack *(Spiraea douglasii-FACW),* Pacific crabapple *(Malus fusca-FACW),* soft rush *(Juncus effusus-FACW),* salmonberry *(Rubus spectabilis-FAC),* a little slough sedge *(Carex obnupta-OBL),* black cottonwood *(Populus balsamifera-FAC), and cascara-Rhamnus purshiana-FAC).*

The road improvement project on Steilacoom Road SE meets all of the requirements of *TCC Prairie Ordinance 14542, WDFW Management Recommendations for Washington Priority Habitats Oregon White Oak Woodlands and WDFW Habitat Management Recommendations for the Mazama Pocket Gophers.* The quality of prairie habitat in the road-right-way is poor at best.

It is KES's professional opinion that there will be impacts to Mazama Pocket Gophers and oak trees and mitigation will be as a result of this project. Even though the project will have impacts, it does not meet the definition of a Prairie per *Thurston County Critical Areas Ordinance Title 24.03 (Definitions), Interim Prairie Ordinance 14542, WDFW's Management Recommendations for Washington Priority Habitats Oregon White Oak Woodlands and WDFW Habitat Management Recommendations for the Mazama Pocket Gophers.*

KES personnel have based the above conclusions on standardized scientific methods and best professional judgment. Local, state, and federal regulatory agencies may or may not agree with the findings presented in this report. The services described in this report were performed consistent with generally accepted professional consulting principles and practices. There are no other warranties, expressed or implied. The services preformed were consistent with our agreement with our client. This report is prepared solely for the use of our client and may not be used or relied upon by a third party for any purpose. Any such use or reliance will be at such party's risk. The opinions and recommendations contained in this report apply to conditions existing when services were performed. Key Environmental Solutions, LLC, (KES) is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report. KES does not warrant the accuracy of supplemental information incorporated in this report that was supplied by others.

Thank you for the opportunity to evaluate this project and please contact us at (360) 942-3184 or (360) 562-5763 should you have any questions.

Sincerely,

Key McMurry

Key McMurry
Owner/Professional Stream and Wildlife Biologist, PWS

Center for Natural Lands Management

Prairie Habitat Assessment Methodology (PHAM) – Steilacoom Road Improvement Project

We employed the Prairie Habitat Assessment Methodology (PHAM) along Steilacoom Road between Pacific Avenue and Marvin Road on 31 October 2014. Surveys were conducted by Bill Kronland (*Prairie Restoration Project Manager*, *Center for Natural Lands Management*) and Adam Martin (*Prairie Restoration Specialist*, *Center for Natural Lands Management*), with Jeremy Davis (*Senior Planner*, *Thurston County Planning*) in attendance. The surveys were intended to assess the PHAM process along linear road-improvement projects while identifying locations of Mazama pocket gopher (*Thomomys mazama pugetensis*) mounds within a proposed roadway-safety improvement project boundary.

The project area was approximately 1.4 km long and bounded by high-density housing developments to the north and south along 67 % (0.94 km) of its length, with Nisqually Middle School and undeveloped open space situated along 33 % (0.46 km) of the project area near Marvin Road. Most of the proposed project (1.08 km) was approximately 47 m wide with an assessment area (2 – 4 m wide) situated between private residences and Steilacoom Road. This assessment area primarily consisted of ditches with largely non-native herbaceous vegetation and mixed native and non-native shrubs and trees (Figure 1). The remainder of the project area (0.32 km) varied in width between 81 m and 238 m, with the maintained lawn of Nisqually Middle School to the north and degraded-prairie open space to the south (Figure 2).

Figure 1. Example of assessment area between private residence and road pavement along western portion of Steilacoom Road.

Analysis units (25-m^2) were distributed within the project area using ArcMap v.10.1 software (ESRI 2011) prior to collecting field data. Units were loaded onto hand-help Trimble Juno GPS units, and data were recorded electronically on these devices in the field. Surveys were conducted beyond the window for vegetation assessment (1 April to 15 June), and only gopher-mound locations were recorded. We detected gopher mounds within 6 cells, each along the eastern portion of the project area (Figure 3).

The PHAM protocol assesses prairie landscapes at the scale of 25-m^2 analysis units. We were able to fit only a small number of intact units into the Steilacoom Road project area due to the narrow and linear configuration of the proposed improvements. Of those intact units, only those near the intersection with Marvin Road where the project was at its greatest width were suitable for assessment (i.e., not almost exclusively comprised of paved area). Moreover, only a relative fraction of the project area contained ground that was not paved or within private ownership.

Figure 2. Example of assessment area along eastern portion of Steilacoom Road, adjacent to open-space area and Nisqually Middle School.

We concluded the scale at which PHAM assess prairie landscapes was not suitable for narrow and linear road-improvement projects, which can be more efficiently assessed by simply walking the length of the project boundary and recording mound presence. Alternatively, linear transects segmented into 25-m intervals could be placed along either side of a proposed project, and mound presence and vegetation assessed within each interval.

PHAM may be suitable for linear projects that involve new-road construction, or road-improvements that require a significant widening of an existing road corridor. In both instances, the area to be assessed should be at a sufficient scale to accommodate 25-m^2 analysis units, otherwise different methods (e.g., narrow-width belt transects) could be employed to more efficiently asses a site.

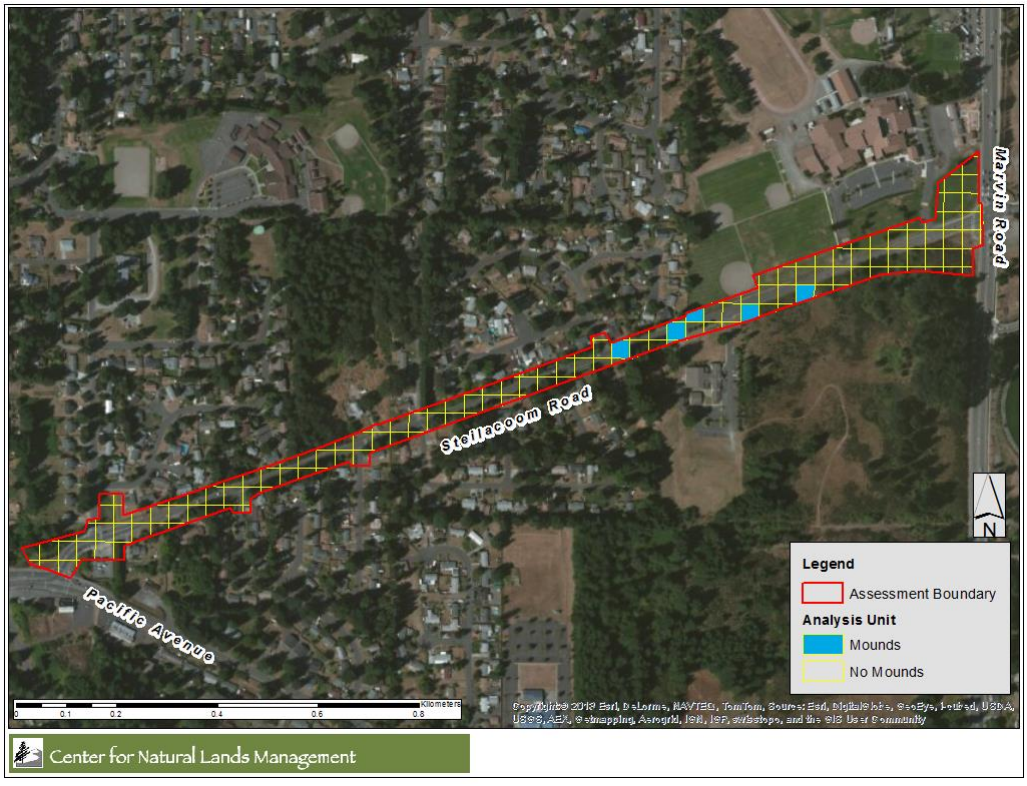

Figure 3. Steilacoom Road assessment boundary and analysis units with cells occupied with Mazama pocket gopher mounds, 31 October 2014.

SUF

S O U N D U R B A N F O R E S T R Y, LLC

Appraisals ~ Site Planning ~ Urban Landscape Design and Management
Environmental Education ~ Environmental Restoration

10/1/14

Robert W. Droll, Landscape Architect, PS
4405 7th Ave. SE, Suite 203
Lacey, WA 98503

Cc: Theresa Parsons, Thurston County Public Works Civil Engineer

RE: Steilacoom Road Phase 1. Project No. 61461 - Impacted Trees

Mr. Droll:

Upon your request, I have conducted an evaluation of the section of Steilacoom Road involved in the upcoming re-development from Pacific Avenue to Marvin Road. The purpose of my evaluation was to collect preliminary information on trees within rights-of-way and private property that could potentially be impacted by the project.

Purpose of this Report

The purpose of this report is to present my findings as well as the appraised values for any private trees that will require removal.

Methodology

To assess and determine impacted trees within the project area I utilized the Draft Steilacoom Rd. 50% Design Set. It should be noted that the rights-of-way was not field marked or staked during my site work.

The tree data collected consisted of identification of trees presented on the site plan; determine tree location, species, size and condition.

Findings

In order to provide clear information, I have broken the identified trees down by the associated adjacent private or public property.

SOUTH SIDE OF ROAD, STARTING AT THE WEST END

7545 Steilacoom Road

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	*Appraised Value
Possibly Retain	Private	Douglas Fir	20	Good		
Possibly Retain	Private	Douglas Fir	40	Good		
Possibly Remove	Private	Ponderosa Pine	40	Good		$24,500
Possibly Remove	Private	Douglas Fir	18	Fair		$3,090

*Appraised values were determined by using the Guide for Plant Appraisal 9th Ed., International Society of Arboriculture Publication, 2000. Trunk Formula Method

710 Oakcrest St

There is a Douglas fir shown on the survey that is not there.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Remove	Public	Douglas Fir	29	Good	
Remove	Public	Bigleaf Maple	55	Fair	3 stems; *Ganoderma* infection
Remove	Public	Apple	6	Good	

714 Oakcrest Drive

The survey shows 2 Douglas fir, there is only one.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Deodar Cedar	24	Fair	No issues with construction
Remove	Public	Douglas Fir	26	Fair	Double top at 60’
Remove	Public	Sitka Spruce	16	Fair	
Remove	Public	Sitka Spruce	13	Fair	Double stem at 10’
Remove	Public	Sitka Spruce	12	Good	
Remove	On the line	Douglas Fir	12	Good	

727 Oakcrest Ct.

In addition to the following 2 trees, there are 2 Douglas fir and 2 Oregon oak that are 20-40' from the edge of the ROW. These trees will not be impacted by the project.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Douglas Fir	36	Good	Roots may be impacted, not an issue
Retain	Private	Douglas Fir	32	Good	Roots may be impacted, not an issue

713 Oakcrest Ct

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	Appraised Value
Retain	Private	Douglas Fir	34	Good	No impact from the construction	
Retain	Private	Douglas Fir	28	Good	No impact from the construction	
Retain	Private	Douglas Fir	27	Good	No impact from the construction	
Possibly Retain	On the ROW Line	Oregon Oak	16	Good		
Remove	Private	Douglas Fir	18	Poor	Bad structure; too close to the construction	$1,140
Remove	Private	Douglas Fir	18	Poor	Bad structure; too close to the construction	$1,140
Remove	Private	Douglas Fir	16	Fair	Shaded out	$380
Remove	Public	Douglas Fir	14	Good		
Remove	Public	Douglas Fir	20	Fair	Outside of fence in ROW	

726 Oakcrest Ct

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Douglas Fir	7	Fair	
Retain	Private	Douglas Fir	4	Poor	
Retain	Private	Douglas Fir	5	Poor	
Retain	Private	Douglas Fir	12	Poor	Tree has been topped
Retain	Private	Western Red Cedar	3	Poor	Tree has been topped
Retain	Private	Douglas Fir	2	Poor	
Retain	Private	Douglas Fir	10	Poor	
Retain	Private	Douglas Fir	16	Poor	
Retain	Private	Western Red Cedar	4	Poor	
Retain	Private	Western Red Cedar	7	Poor	
Retain	Private	Douglas Fir	16	Poor	
Retain	Private	Western Red Cedar	12	Poor	
Retain	Private	Douglas Fir	12	Poor	
Retain	Private	Western Red Cedar	12	Fair	
Retain	Private	Western Red Cedar	3	Poor	
Remove	On the Line	Douglas Fir	16	Fair	
Remove	Public	Douglas Fir	27	Fair	
Remove	Public	Douglas Fir	9	Poor	Poor structure

709 Oakcrest St.

The survey also shows a couple of trees further east on the ROW that are not there.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Bigleaf Maple	22+26	Good	No issues with construction
Remove	Public	Eastern Dogwood	11	Fair	

710 Oakcrest St.

The survey shows Douglas fir just outside of ROW, at the NW corner of the house that is not there.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Remove	Public	Douglas Fir	29	Good	
Remove	Public	Bigleaf Maple	55	Fair	An inner stem is dead due to *Ganoderma* infection
Remove	Public	Apple	6	Good	

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7801 Royal Oak

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Possibly Retain	Private	Douglas Fir	19	Good	
Remove	Public	Oregon Oak	14	Fair	Just inside of ROW; being shaded by adjacent maple
Remove	Public	Oregon Oak	18	Good	

7802 Royal Oak

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Norway Spruce	12+4	Fair	No issues with construction
Retain	Private	Bigleaf Maple	8	Fair	Should be able to retain
Retain	Private	Bigleaf Maple	6	Fair	Should be able to retain
Retain	Private	Bigleaf Maple	12	Fair	Should be able to retain
Retain	Private	Bigleaf Maple	2	Fair	Should be able to retain
Retain	Private	Bigleaf Maple	28	Fair	Should be able to retain
Retain	Private	Oregon Oak	12	Good	No issues with construction

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Oregon Oak	8	Fair	No issues with construction
Retain	Private	Oregon Oak	10	Fair	No issues with construction
Retain	Private	Oregon Oak	6	Dead	
Remove	Public	Bigleaf Maple	20	Fair	
Remove	Public	Bigleaf Maple	22	Fair	
Remove	Public	Bigleaf Maple	24	Fair	
Remove	?	Bigleaf Maple	8	Good	
Remove	Public	Pear	16	Fair	

709 Cottonwood Ct.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Leyland	Avg. 10	Good	Row of 29 trees, no issues with construction
Remove	Public	Pacific Willow	3	Good	
Remove	Public	Pacific Willow	3	Good	
Remove	Public	Pacific Willow	4	Good	
Remove	Public	Pacific Willow	2	Good	
Remove	Public	Serviceberry	2	Poor	
Remove	Public	Serviceberry	2	Poor	
Remove	Public	Serviceberry	6	Poor	
Remove	Public	Serviceberry	8	Poor	
Remove	On the line	Pacific Willow	10	Fair	
Remove	On the line	Pacific Willow	4	Fair	
Remove	On the line	Pacific Willow	5	Fair	
Remove	On the line	Pacific Willow	6	Fair	
Remove	Public	Douglas Fir	18	Fair	

710 Cottonwood

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Bigleaf Maple	6	Fair	
Remove	Public	Oregon Oak	15	Good	

705 Vine Maple

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Remove	Public	Apple	12	Fair	
Remove	Public	Douglas Fir	32	Good	
Remove	Public	Douglas Fir	25	Fair	

7925 Steilacoom Rd

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Remove	Public	Port Orford Cedar	15+15+16	Fair	Edge tree associated with a screen planting; grind the stump

7941 Steilacoom Rd

These trees are to the west of the driveway and were not shown on the survey

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Western Hemlock	28	Good	Roots may need to be cut
Retain	Private	Douglas Fir	25	Good	Roots may need to be cut
Retain	Private	Eastern Dogwood	8	Fair	
Remove	Public	Douglas Fir	28	Good	
Remove	Public	Douglas Fir	21	Good	
Remove	Public	Douglas Fir	19	Good	
Remove	Public	Pacific Madrone	8	Fair	
Remove	Public	Port Orford Cedar	6	Dead	

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Remove	Public	Port Orford Cedar	9	Dead	
Remove	Public	Austrian Pine	22	Fair	
Remove	Public	Austrian Pine	18	Fair	
Remove	Public	Scotch Pine	12	Poor	
Remove	Public	Scotch Pine	13	Fair	

7941 Steilacoom Road

The following 32 trees are located to the east of the driveway, they are all identified on the survey as 14" spruce.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Remove	Public	31 Austrian Pine	5-22	Fair	
Remove	Public	Scotch Pine	9	Poor	

7945 Steilacoom Road

These are street trees within a ROW planting strip.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Remove	Public	Red Bud	13	Fair	
Remove	Public	Red Bud	12	Fair	
Remove	Public	Red Bud	12	Good	
Remove	Public	Red Bud	10	Fair	
Remove	Public	Red Bud	10	Fair	
Remove	Public	Red Bud	11	Poor	Split trunk with active separation

Lacey Parks Property

These trees appear to be within the City's property.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	Appraised Value
Remove	Private	Douglas Fir	8	Poor	Suppressed by adjacent tree	$20
Remove	Private	Douglas Fir	34	Good		$12,600

NORTH SIDE OF ROAD, STARTING AT WEST END

It should be noted that overhead utility lines run along this side of the road. This can have a significant impact on the appraisal values if the trees have been topped for clearance.

7513 Titus Ct.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Douglas Fir	12	Good	No issues with construction
Retain	Private	Austrian Pine	14	Good	No issues with construction

7523 Titus Ct

There are also 14 trees along the back side of the residence that are on the same elevation as the house. They are 5-12' from the fence/ROW line and should not be an issue with the project.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	2 Douglas Fir	5	Poor	Previously topped
Retain	Private	Douglas Fir	6	Poor	Previously topped
Retain	Private	2 Douglas Fir	8	Poor	Previously topped
Retain	Private	2 Douglas Fir	9	Poor	Previously topped
Retain	Private	Douglas Fir	10	Poor	Previously topped
Retain	Private	2 Douglas Fir	12	Poor	Previously topped

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	2 Douglas Fir	16	Poor	Previously topped
Retain	Private	Douglas Fir	20	Poor	Previously topped
Retain	Private	Austrian Pine	9	Poor	Previously topped
Retain	Private	Shore Pine	11	Poor	Previously topped

7527 Titus Ct.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	On the line	Douglas Fir	10	Poor	Previously topped; at the top of the slope, won't likely be impacted
Retain	Private	Douglas Fir	16	Poor	Previously topped; set back from ROW, no issues
Remove	Public	Scotch Pine	8	Poor	Previously topped
Remove	?	Douglas Fir	17	Poor	Previously topped
Remove	Public	Scotch Pine	5	Poor	Previously topped
Remove	Public	Douglas Fir	16	Poor	Previously topped
Remove	Public	Douglas Fir	6	Poor	Previously topped
Remove	Public	Oregon Oak	9	Poor	Previously topped

618 Laker Ct.

There are several additional oaks shown on the survey but they are back from the head of the slope and definitely will not be an issue.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Fruiting Plum	3	Poor	Not surveyed
Retain	Private	Douglas Fir	8	Poor	Previously topped
Retain	Private	Oregon Oak	9	Poor	Previously topped
Retain	Private	Serviceberry	12	Fair	Not surveyed
Retain	Private	Oregon Oak	2	Fair	
Retain	Private	Oregon Oak	10	Fair	Previously topped
Retain	Private	Oregon Oak	8	Poor	Previously topped
Retain	Private	Oregon Oak	5	Poor	Previously topped
Retain	Private	Oregon Oak	2	Fair	One the prop. line, top of slope

7630 Steilacoom Rd.

In addition to the following trees, there are large diameter oak and fir that are set back from the ROW that will not be affected by the project. Within the ROW are also native shrubs and small diameter oak.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Oregon Oak	5	Fair	
Retain	Private	Oregon Oak	16+12	Good	
Retain	Private	Oregon Oak	10+12	Good	
Retain	Private	Douglas Fir	19	Good	
Retain	Private	Oregon Oak	16	Good	
Retain	Private	Oregon Oak	17	Good	
Retain	Private	Oregon Oak	20	Good	
Retain	Private	Oregon Oak	16	Good	
Retain	Private	Oregon Oak	12	Good	
Retain	Private	Oregon Oak	6	Good	
Retain	Private	Oregon Oak	4+4+6+1	Good	Stump Sprout
Remove	Public	4 Oregon Oak	2-4	Fair	
Remove	Public	Plum	1	Good	
Remove	Public	40+ Oregon Oak	1-3	Good	

7602 Steilacoom Rd

These trees have not been surveyed.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	3 Douglas Fir	3-6	Fair	
Retain	Private	Purple Plum	34	Poor	Previously topped, multi-stem

622 Laker Ct.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Japanese Maple	3+4+8	Good	Set back approx. 6' from top of slope
Retain	Private	Hazel	14'x16'	Good	

7634 Steilacoom Rd.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Pear	5	Fair	Multi-stem
Retain	Private	Apple	12	Fair	Multi-stem
Remove?	Public	Plum	3	Fair	

7806 Steilacoom Rd.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	English Laurel Hedge	12-14' Tall	Good	
Retain	Private	Douglas Fir	14	Poor	Previously topped
Retain	Private	Douglas Fir	6	Poor	Previously topped

7808 Steilacoom Rd.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Blue Atlas Cedar	24	Fair	Side pruned for line clearance, set back 12'+

7816 6th Way

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	Appraisal Value
Retain	Private	Douglas Fir	16	Poor	Previously topped	
Retain	Private	English Laurel	14	Fair		
Retain	Private	Douglas Fir	16	Poor	Previously topped	
Retain	Private	Fruiting Cherry	16	Poor	Previously topped	

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	Appraisal Value
Retain	Private	Austrian Pine	10	Poor	Previously topped	
Retain	Private	Austrian Pine	10	Poor	Previously topped	
Retain	Private	White Birch	11+12	Poor	Previously topped	
Retain	Private	Douglas Fir	18	Poor	Previously topped	
Remove	Public	Douglas Fir	16	Poor	Previously topped	
Remove	Public	Fruiting Plum	4	Poor		
Remove	Private	Douglas Fir	16	Poor	Previously topped	$140
Remove	Private	Douglas Fir	11	Poor	Previously topped	$70
Remove	On the line	Douglas Fir	16	Poor	Previously topped	$140
Remove	Private	Douglas Fir	20	Poor	Previously topped	$70
Remove	Private	Purple Plum	6	Poor	Previously topped	$20
Remove	Private	Douglas Fir	7	Poor	Previously topped	$30
Remove	Private	Douglas Fir	6	Dead		

7832 Steilacoom Rd

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments
Retain	Private	Douglas Fir	25	Fair	Side pruned for clearance, no issues with construction

7848 6th Way

Trees along this stretch were not surveyed. They are located inside of the fence but I do not know where the ROW line is.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	Appraisal Value
Retain	Private	Douglas Fir	20	Fair	Previously topped but has reestablished a new leader, side pruned	
Retain	Private	Douglas Fir	14	Fair	Previously topped	
Retain	Private	Douglas Fir	21	Fair	Previously topped	
Retain	Private	3 Douglas Fir	16	Poor	Previously topped	
Retain	Private	Douglas Fir	18	Poor	Previously topped	
Remove	Private	Douglas Fir	25	Poor	This tree will lose too many roots	$360

625 Pamela Dr.

These trees are located inside the fence but the survey indicates some are inside, some are outside ROW.

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	Appraisal Value
Retain	Private	Douglas Fir	15	Poor	Previously topped	
Retain	Private	2 Douglas Fir	17	Poor	Previously topped	
Retain	Private	3 Douglas Fir	18	Poor	Previously topped	
Retain	Private	Pin Oak	18	Poor	Previously topped	
Remove	Private	Douglas Fir	21	Poor	Previously topped	$130
Remove	Private	2 Douglas Fir	16	Poor	Previously topped	$160
Remove	Private	Red Oak	16	Poor	Previously topped	$830
Remove	Public	Douglas Fir	20	Poor	Previously topped	
Remove	Public	Douglas Fir	11	Poor	Previously topped	
Remove	Public	Douglas Fir	12	Poor	Previously topped	

Retain or Remove	Public or Private	Tree Species	Trunk Diameter	Condition	Comments	Appraisal Value
Remove	Public	Douglas Fir	13	Poor	Previously topped	
Remove	Public	Douglas Fir	17	Poor	Previously topped	
Remove	Public	Douglas Fir	14	Poor	Previously topped	
Remove	Public	Douglas Fir	15	Poor	Previously topped	

Comment

As previously mentioned, this information is preliminary. When rights-of-way staking is completed, I will be able to further assess specific trees as to their ownership, potential for retention, removal requirement, value and also provide tree protection measure that can be included with the final site plan and construction notes.

Please feel free to contact me if you should have any questions.

Sincerely,

Kevin M. McFarland, SUF
Consulting Forester/ISA Certified Arborist PN-0373 & Chapter Certified Tree Risk Assessor #862

Sound Urban Forestry, LLC
PMB 97, 1910 E. 4th Ave.
Olympia, WA 98506
360-870-2511

Impacts to Oregon White Oak Woodlands
Due to
Steilacoom Road -Pacific Avenue to Marvin Road
Road Improvement Project

March 2015
Jeanne Kinney
Environmental Coordinator
Thurston County Public Works

Introduction:

Thurston County Public Works is proposing to improve approximately miles of Steilacoom Road between Pacific Avenue and Marvin Road. A vicinity map for the project is included. An evaluation of trees that could potentially be impacted by the project was conducted by Kevin McFarland with Sound Urban Forestry in September, 2014. Approximately 49 oaks will be removed from the right-of-way as part of this project. The majority of oaks are seedlings, with 40 having a diameter of 1-3 inches, but four are larger than 10 inches in diameter (see chart of diameters). None of the oaks to be removed are part of "oak woodlands", an important habitat protected under the Thurston County Critical Areas Ordinance, although there are oak woodlands in the vicinity of the project, especially south of the intersection of Steilacoom Road and Marvin Road. This report has been prepared to assess the impact of the project on oaks and to determine appropriate mitigation measures for these impacts.

Project Description:

This is a safety project that will widen the existing pavement, providing two 11 foot wide travel lanes, two 5 foot wide bicycle lanes, and two 6 foot wide sidewalks. Auxilliary turn lanes will be added along the full frontage of Nisqually Middle School and the future third phase of the Regional Athletic Center (RAC), which is across the street from the middle school. Sidewalks at Nisqually Middle School and the third phase of the RAC will be 8 feet wide, with 6 foot wide sidewalks along the rest of the project. The improvements also will include curbs and gutters on both sides of the road, illumination and planter strips with raingardens and/or bioinfiltration swales between the curb and sidewalk. Most of the project is within existing right-of-way, but narrow strips of right-of-way may need to be acquired to accommodate the bio-infiltration swales or sidewalks (see attached aerial). Mazama pocket gophers are adjacent to the project as well as Oregon White oaks, which may require purchase of ROW for mitigation to those species. Major work involves grading, surfacing, drainage and paving. The project is located in T18N, R1W, S14.

Oaks in the Landscape:

Oregon White Oak (*Quercus garryana*), also known as garry oak, is western Washington's only native oak and is distributed along the Pacific Coast from southwestern British Columbia, including Vancouver Island, south through western Washington and Oregon to the Coast Ranges and the Sierra Nevada in southern California (Arno, 1977). Oregon white oak occurs in open

savannas or in monospecific closed-canopy stands. It is also found in mixed stands with conifers or broad-leaved trees, generally in lower elevations, drier areas and areas with historically limited conifer competition. West of the Cascades, oaks are found within the Western Hemlock Forest Zone and often occupy the narrow sub-zone between prairies and conifer forests (Larson, 1998).

Priority Oregon white oak woodlands as defined by the Washington Department of Fish and Wildlife, are stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is >25% or where total canopy coverage of the stand is <25%, but oak accounts for at least 50% of the canopy coverage present. The latter is known as an oak savanna. In non-urbanized areas west of the Cascades, priority oak habitat consists of stands >1 acre in size. In urban or urbanizing areas, single oaks or stands of oaks < 1 acre in size may also be considered priority habitat when found to be particularly valuable to fish and wildlife (i.e. they contain many cavities, have a large diameter at breast height (dbh), are used by priority species, or have a large canopy). A dbh > than 20 inches is considered a large oak and a dbh > 12 inches is considered a medium size oak (Larson, 1998). A mature oak ranges from 25-90 feet high and 24-40 inches dbh.

Regeneration:

Sexual: Oregon white oak is wind pollinated. Acorns develop in one year. The mast (accumulation of nuts on the ground) may be heavy but crops are often irregular. Acorn predation is high; often the entire mast is consumed (Arno, 1977). Fresh acorns germinate immediately under warm, moist conditions. Initial growth after germination is concentrated on development of a taproot. Shoot development is relatively slow; seedlings take 10 years or more to attain 3.3 feet in height. Many seedlings are killed by browsing livestock, deer or rodents. Pocket gophers frequently destroy young roots (Burns and Honkala, 1990).

Vegetative: Oregon white oak sprouts from the trunk and root crown following cutting or burning. Some sprouts that arise after burning resemble rhizomes in appearance and growth habit. They originate from the root crown and extend several yards before emerging from the humus (Reed and Sugihara, 1987). Sprouts grow rapidly; three year old sprouts in Humbolt and Trinity Counties, California, averaged 9.2 feet in height (MacDonald, et al, 1983).

Importance to Wildlife

Major wildlife values of Oregon white oak are from acorns and leaves used as food sources, cavities used for nesting and protection from inclement weather and predators, and tree structure and canopy used by primarily birds and squirrels, and to a lesser extent by other mammals and invertebrates. Oregon white oak woodlands are used by more than 200 vertebrate and numerous invertebrate species, some of which are state listed as Sensitive, Threatened, Endangered, or are candidates for these listings. Many invertebrates, including various moths, butterflies, gall wasps and spiders, are found exclusively in association with this oak species. Oak/conifer associations provide contiguous aerial pathways for animals such as the State Threatened western gray

squirrel, and they provide important roosting, nesting and feeding habitats for wild turkeys and other birds and mammals (Larson and Morgan, 1998). Oregon white oak is the preferred forage and nesting cover of the black-capped chickadee, white breasted nuthatch, Bewick's wren, bushtit and orange-crowned, MacGillivray's and Wilson's warblers (Anderson, 1980).

Dead oaks and dead portions of live oaks harbor insect populations and provide nesting cavities. Acorns, oak leaves, fungi and insects provide food. Wildlife use of Oregon white oak woodlands is dependent on structural and spatial conditions. Open-canopy stands of oak generally have more complex plant understories than closed-canopy stands and can, therefore, support more wildlife species. Oak/conifer associations provide contiguous aerial pathways for squirrels and other animals.

Oak snags and dead portions of live trees are significant because of cavities. Cavities can develop in dead trees (snags), dead portions of live trees and sound live trees. A number of natural pressures can weaken portions of an oak or cause them to perish, thus providing opportunities for primary excavators to produce cavities. Thirty-one species of fungi also affect Oregon white oak. Decomposing fungi, coupled with the rotting characteristics of this oak species, simplify the excavation of cavities for woodpeckers by softening wood. The process is often facilitated by the loss of limbs that expose heartwood (Larson and Morgan, 1998).

Oregon White Oak as Priority Habitats Under the Thurston County Critical Areas Ordinance:

24.25.065 Fish and wildlife habitat conservation areas – Important habitats and species.

4. Oregon white oak (Quercus garryana) woodlands, stands, and individual trees meeting the following criteria are subject to this section:

"Oak habitat" means stands of Oregon white oak (Quercus garryana) or Oregon white oak/conifer associations where canopy coverage of the oak component of the stand is twenty-five percent (25%) or more; or where total canopy coverage of the stand is less than twenty-five percent (25%), but oak accounts for at least fifty percent (50%) of the canopy coverage. The latter is often referred to as oak savanna. Oak habitat includes oak savannas and oak woodlands.

a. Oak woodlands, as defined in chapter 24.03 TCC. ("Oak woodlands" means those stands of Oregon white oak (Quercus garryana) or Oregon white oak/conifer associations where the crown cover of the Oregon white oak component of the stand is greater than or equal to twenty-five percent (25%). In degraded habitat, the Oregon white oak component of the stand may be less than twenty-five percent (25%), or the canopy coverage may be less than fifty percent (50%)).

b. Oak Savanna, as defined in chapter 24.03 TCC. ("Oak savanna" means an Oak Habitat with a community of widely spaced Oregon white oak trees (Quercus garryana) where total canopy coverage is less than twenty-five percent (25%) but where Oregon white oak accounts for at least fifty percent (50%) of the canopy coverage above a layer of native prairie grasses and

forbs. The spacing of these trees is widely scattered so that there is no closed canopy and groups of trees. In degraded habitat, trees may be more widely spaced above a layer of non-native vegetation on developed property.

> c. Individual oak trees and stands of oak or oak conifer associations less than one acre in size that are located within one-half (0.5) mile of a stand meeting the criteria in this subparagraph.

The Thurston Geodata Center has a map layer of oak distribution which gives a general idea of oak presence with an accuracy of +/ – 200 feet in the area. Examination of this map as well as investigation in the field shows that none of the areas impacted by the Steilacoom Road project have the amount of oaks or other criteria to qualify as oak habitat as defined under the CAO. However, there is designated Oak Habitat in the vicinity, particularly south of Steilacoom Road near the intersection with Marvin Road.

Impacts to Oregon White Oaks from This Project

Thurston County Public Works is committed to identifying all impacted oaks and developing a mitigation plan if warranted, so we contracted with Kevin McFarland of Sound Urban Forestry (SUF) to evaluate the health of trees within the proposed road prism that could potentially be impacted by the project. Twenty-three oaks, ranging in diameter between one inch and 20 inches are within the project footprint, but will not be impacted by the project. Forty seedlings less than 3 inches diameter will be removed. The seedlings are present within the right-of-way on each side of the road and appear regularly mowed by road maintenance personnel as part of routine roadside maintenance. Regular mowing is indicated by sprouts coming out of stumps, seedlings growing close to the ground rather than upright, and prevalence of seedlings of the same height (length) on the grassed slope adjacent to the road. Because of regular mowing, these oaks will never have the opportunity to provide the food and habitat that larger, acorn producing trees would. The larger oaks are generally on the edge of clearing limits, outside the mowed area and will still be able to produce acorns and other benefits to wildlife.

Land Use

This project is not expected to have any long-term effects on land use.

Erosion Control

Removal of the existing oaks should not cause erosion. Timing of clearing and grubbing and erosion control practices used for the construction as a whole will also be used in oak removal and replanting. A proposed mitigation site has been identified in between the existing oak groves in the southwest quadrant of the Steilacoom –Marvin Road intersection. Planting the oaks at the proposed mitigation site should not cause erosion. Both sites are flat to rolling, with little topographic change. Although the preferred time of planting is autumn when seasonal rains might contribute to erosion, weed mats around each oak will protect exposed soil from precipitation. Oaks will be spaced about 18 feet apart and vegetation will be retained in between, reducing erosion potential. Soils in the area are well drained and precipitation tends to soak in rather than run off, minimizing erosion.

Mitigation under the Thurston County Critical Areas Ordinance

According to the Thurston County Critical Areas Ordinance, mitigation includes avoiding, minimizing or compensating for adverse critical area impacts. Mitigation is, in the following order of preference:

a. Avoiding the impact altogether by not taking a certain action or parts of an action. Completion of this project cannot avoid some impact to the existing vegetation. However, according to the recommendations by WDFW, mitigation includes avoidance of any impact to trees considered to be valuable trees: ie. large oaks (>20 in dbh), medium oaks (>12 in dbh), older oaks and oaks with well formed, dominant crowns.

Action by Public Works department: The project has been redesigned to avoid impacts to trees that meet these criteria to the extent possible.

b. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.

Action by Public Works department: While complete avoidance of impacts is not possible on this project, oaks that will be removed, especially the 40 seedlings, have limited wildlife value due to their isolation from other oaks and their lack of potentially developing to maturity because they are repeatedly mowed by maintenance crews. Oaks that will be removed do not meet the criteria for priority habitat. Therefore, impact to priority habitat is being minimized as much as possible.

c. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

Action by Public Works department: 40 Oaks will be planted to mitigate for seedlings removed, at the proposed site between the existing oak groves west of Marvin Road and south of Steilacoom Road.

Reintroduction of oaks will add diversification to the landscape and these oaks will have the potential to grow to maturity, bearing acorns and creating habitat for those species dependent on oaks, a situation that will not occur along the maintained roadside where the majority of seedlings are being removed. Therefore, the oak habitat being created will be of much greater habitat value for oak dependent species than that of the habitat being disturbed.

Site plans are included that show roughly where the oaks will be planted. Exact locations will be determined in the field at time of planting. Oaks will be planted on 18 foot centers, with browse guards and weed mats.

d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

Action by Public Works department: existing trees and seedlings that have the potential to grow into trees, will be protected during construction by project design, flagging, barricades, or other protection to minimize impacts to their trunks, limbs and roots. Oaks being planted are on

sites designated for preservation and conservation or low impact use, which will protect the oaks for the future.

e. Compensating for the impact by replacing, enhancing or providing substitute resources or environments.

Action by Public Works department: replacement trees will be planted as described under section C above.

f. Monitoring the impact and taking appropriate corrective measures.

Action by Public Works department: Oaks will be monitored for 80 % survival for three years after planting. Dead oaks numbering more than 20% of total for each site will be replaced.

Contingency Plans for Mitigation

A Memorandum of Understanding (MOU) will be signed by the County Engineer and the designated representative for the Lacey parcel. The MOU will outline the number of oaks, where they will be planted and responsibilities of each party to the agreement. The representatives for Lacey have been contacted and are in support of having oaks planted on site and agree to protect them and encourage their growth by watering and maintaining them until establishment.

Summary

In summary, the right-of-way beside Steilacoom Road does not meet the criteria for oak habitat Some wildlife value is being provided by the oaks to be removed, chiefly for cover for certain kinds of birds and possibly reptiles and small mammals. However, the canopy connectivity between oaks that is utilized by western gray squirrels is not present in the isolated oaks to be removed. The majority of oaks being removed are seedlings from the mowed right-of-way that do not have the potential to develop into mature trees or to provide the habitat necessary for oak dependent species.

The Thurston County Public Works Department has addressed all the mitigation criteria listed in the Thurston County Critical Areas Ordinance, and the Management Recommendations for Washington's Priority Habitats: Oregon White Oak Woodlands, by avoidance of impacts where possible and replanting oaks where avoidance is not possible. Public Works proposes to plant 40 oak seedlings at a site between two existing oak groves to compensate for the removal of an estimated 40 seedling oaks. Larger oaks will be retained on site.

Please send your comments and suggestions regarding this plan to

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