Skamania County, WA
Total:$182.50
EASE
Pgs=80

2021-002219
06/24/2021 09:01 AM

Request of: FRANK MALDONADO

00009307202100022190800808

After Recording Return to:

City of Stevenson
7121 East Loop Road
PO Box 371
Stevenson, WA 98648
planning@ci.stevenson.wa.us
1 (509)427-5970

SKAMANIA COUNTY
REAL ESTATE EXCISE TAX
N/A
JUN 24 2021
PAID N/A
Deputy
SKAMANIA COUNTY TREASURER

CONSERVATION EASEMENT

GRANTORS: Erwin L&I, LLC & OPH DBD, LLC &, Rawlings Family Investments, LLC (the "Grantor")
GRANTEE: CITY OF STEVENSON, a municipal corporation (the "Grantee")
Legal Description:
Abbreviated Form: Lot 1 and Lot 2 of the "Replat of Lots 2, 3, and 4 of Short Subdivision of Tax Lot 02-07-01-1300", according to the official plat thereof on file and of record in the office of the auditor of Skamania County, Washington, at AFN 2021-002217.
formally described as:
Lots 2, 3, and 4 of "Short Subdivision of Tax Lot 02-07-01-1300 for Skamania County", according to the official plat thereof on file and of record in the office of the auditor of Skamania County, Washington, at Book T of Plats, Page 100.
Additional on: Exhibit "A"
Assessor's Tax Parcel Nos: 02-07-01-0-0-1302 and -1303

This Conservation Easement is made this 24 day of June, 2021 by Erwin L&I, LLC & OPH DBD, LLC &, Rawlings Family Investments, LLC having an address of 5101 NE 82 Ave Vancouver WA 98662 hereinafter referred to as "Grantor" in favor of the City of Stevenson, a municipal corporation and political subdivision of the State of Washington, having an address 7121 East Loop Road, PO Box 371, Stevenson, WA 98648, hereinafter referred to as "City" or "Grantee".

WITNESSETH:

WHEREAS, Grantor solely owns in fee simple certain real property in the City of Stevenson, Washington, more particularly described in Exhibit "A", attached hereto and incorporated by this reference.

WHEREAS, In satisfaction of conditions of the Conditional Area Permit decision by the City pertaining to the development of Grantor's property, the Grantor desires to preserve, in perpetuity, a portion of Grantor's property, more particularly as identified as the "Fish & Wildlife Habitat Conservation Area" as represented on the plat map recorded at AFN 2021-002217, incorporated by this reference as the "Property"; and

NOW THEREFORE, in consideration of the mutual covenants, terms, conditions and restrictions contained herein, and in satisfaction of the City's conditions on the Critical Area Permit (CAP 2020-01, Rock Cove Hospitality Center 8-14-2020), Grantor hereby voluntarily grants and conveys to Grantee a conservation easement in perpetuity, over the Property identified in AFN 2021-_____, of the nature and character and to the extent hereinafter set forth as the "Conservation Easement". Grantor fully warrants title to said Property as represented by the plat map recorded at AFN 2021-002217, and will warrant and defend the same against the lawful claims of all persons whomsoever.

1. Purpose. The purpose of this Conservation Easement is to preserve and protect the anadromous fishery resource of Rock Cove and Foster Creek by assuring that the Property will be retained forever in an enhanced natural state and to prevent any use of the Property that is otherwise inconsistent. Nothing in this easement shall encumber or affect any of Grantor's rights relating to any portion of Grantor's property that is not depicted within the Fish & Wildlife Habitat Conservation Area as represented on the plat map recorded at AFN 2021-002217.

2. Prohibited Uses. Any activity on or use of the Property inconsistent with the purpose of this Conservation Easement is prohibited. Without limiting the generality of the foregoing, the following activities and use are expressly prohibited:

(a) Construction or placing buildings, signs, billboards or other advertising, utilities or other structure on or above the ground. However, nothing in this easement shall prohibit Grantor from constructing buildings, structures, or other improvements, including construction of permanent demarcation and/or fencing installed along the outer edge of the Property in accordance with applicable city, state, and federal regulations.

(b) Dumping or placing as landfill any soil, material or other substance. Dumping or placing of trash, waste or unsightly or offensive materials. Material typically associated with habitat enhancement activities, such as topsoil or soil amendments, placed or stored in accordance with applicable City Codes and requirements shall not be prohibited.

(c) Removing or destroying trees, shrubs or other vegetation unless done in conjunction with a Critical Areas Permit from the City of Stevenson or other approval by the Grantee.

(e) Introduction of nonnative plants and nonnative invasive species on the Property, or the planting or introduction of any species of vegetation on the Protected property, except as permitted through CAP2019-02 or as otherwise deemed necessary by Grantee to preserve, protect or enhance the Purpose of this Conservation Easement.

(d) Activities which are detrimental to drainage, flood control, water conservation, erosion control, soil conservation or fish and wildlife habitat preservation.

(e) Division of the Property for residential development in the easement area.

3. Reserved Rights. Reserving unto Grantor, Grantor's successors and assigns, all rights accruing for its ownership of the Property, including the right to engage in or permit or invite others to engage in all uses of the Property that are not expressly prohibited herein and are not inconsistent with the purpose of this Conservation Easement.

4. Rights of Grantee. To accomplish the purposes stated herein, Grantor conveys the following rights to Grantee:

(a) To enter upon and inspect the Property in a reasonable manner and at reasonable times after at least forty-eight (48) hours advance notice, to determine if Grantor or Grantor's successors and assigns are complying with Exhibit "B", the amended Fish & Wildlife Habitat Conservation Area Report attached hereto and incorporated by this reference, and the covenants and prohibitions contained in this Conservation easement.

(b) To proceed at law or in equity to enforce the provisions of this Conservation Easement and the covenants set forth herein, to prevent the occurrence of any of the prohibited activities set forth herein, and require the restoration of areas or features of the Property that may be damaged by any activity inconsistent with this Conservation Easement.

(c) To construct a pedestrian pathway within the proposed easement identified on Exhibit "B", the proposed plat map of this property titled "Replat of Lots 2, 3, and 4 of Short Subdivision of Tax Lot 02-07-01-1300".

5. Grantee's Discretion. No delay or omission by the Grantee in the exercise of any right or remedy upon any breach by Granter shall impair such right or remedy or be construed as a waiver. Grantee shall not be obligated to Grantor, or to any other person or entity, to enforce the provisions of this Conservation Easement.

6. Grantee's Liability. Grantor will assume all liability for any injury or damage to the person or property of third parties which may occur on the Property arising from Grantor's ownership of the Property. Neither Grantor, nor any person or entity claiming by or through Grantor, shall hold Grantee liable for any damage or injury to person or personal property which may occur on the Property. This paragraph 6 shall not apply to the extent the subject damage or injury is caused by the negligence or willful misconduct of Grantee, its employees or agents.

7. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury to or change in the Property resulting from natural causes beyond Grantor's control, including without limitation, fire, flood, storm and earth movement, or from any necessary action taken by Granter under emergency conditions to prevent, abate or mitigate significant injury to the Property or to persons resulting from such causes.

8. Recordation. Grantor shall record this Conservation Easement in timely fashion in the Records of Skamania County, Washington and shall be responsible for all recording costs and taxes necessary to record this Conservation Easement.

9. Successors. The covenants, terms, conditions and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successor and assigns and shall continue as a servitude running in perpetuity with the Property.

IN WITNESS. WHEREOF, Grantor has executed this Conservation Easement on the day and year first above written.

GRANTOR:

_____
of Erwin ~~L&I,~~ LLC

STATE OF WASHINGTON)
) ss:
COUNTY OF Clark)

ON THIS DAY 5/17/21, before me, personally appeared Jerry L. Erwin, known to me (or satisfactorily proven) to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged that he/she/they executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Notary Public
State of Washington
Tamra L Alexander-Miller
Commission Expires 12/01/2021

_____ Notary Public
Print Name: Tamra L. Alexander-Miller

GRANTOR:

F. Dean Maldonado
of OPH DBD, LLC

STATE OF WASHINGTON)
) ss:
COUNTY OF Clark)

ON THIS DAY 5/10/21, before me, personally appeared F. Dean Maldonado, known to me (or satisfactorily proven) to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged that he/she/they executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Notary Public
State of Washington
Tamra L Alexander-Miller
Commission Expires 12/01/2021

Notary Public
Print Name: Tamra L. Alexander-Miller

GRANTOR:

_____
of Rawlings Family Investments, LLC

STATE OF WASHINGTON)
) ss:
COUNTY OF)

ON THIS DAY _____, before me, personally appeared _____, known to me (or satisfactorily proven) to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged that he/she/they executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

_____, Notary Public
Print Name:

GRANTOR:

_____
of OPH DBD, LLC

STATE OF WASHINGTON)
) ss:
COUNTY OF)

ON THIS DAY _____, before me, personally appeared _____, known to me (or satisfactorily proven) to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged that he/she/they executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

_____, Notary Public
Print Name:

GRANTOR:

Greg Rawlings Member
of Rawlings Family Investments, LLC

STATE OF WASHINGTON)
) ss:
COUNTY OF Benton)

ON THIS DAY 5 May 2021, before me, personally appeared Greg Rawlings, known to me (or satisfactorily proven) to be the person(s) whose name(s) is/are subscribed to the within instrument, and acknowledged that he/she/they executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

ALEX WALLET
Notary Public
State of Washington
My Appointment Expires
Nov 5, 2021

Alex Wallet, Notary Public
Print Name: Alex Wallet

EXHIBIT A

Legal Descriptions

PARCEL I: 02-07-01-0-0-1302-00

A TRACT OF LAND IN SECTION 1, TOWNSHIP 2 NORTH, RANGE 7 EAST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF SKAMANIA, STATE OF WASHINGTON, DESCRIBED AS FOLLOWS:

LOT 2 OF THE SHORT SUBDIVISION RECORDED IN BOOK T OF SHORT PLATS, PAGE 100, SKAMANIA COUNTY RECORDS.

PARCEL II: 02-07-01-0-0-1303-00

A TRACT OF LAND IN SECTION 1, TOWNSHIP 2 NORTH, RANGE 7 EAST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF SKAMANIA, STATE OF WASHINGTON, DESCRIBED AS FOLLOWS:

LOT 3 OF THE SHORT SUBDIVISION RECORDED IN BOOK T OF SHORT PLATS, PAGE 100, SKAMANIA COUNTY RECORDS.

PARCEL III: 02-07-01-0-0-1304-00

A TRACT OF LAND IN SECTION1, TOWNSHIP 2 NORTH, RANGE 7 EAST OF THE WILLAMETTE MERIDIAN, IN THE COUNTY OF SKAMANIA, STATE OF WASHINGTON, DESCRIBED AS FOLLOWS:

LOT 4 OF THE SHORT SUBDIVISION RECORDED IN BOOK T OF SHORT PLATS, PAGE 100, SKAMANIA COUNTY RECORDS.

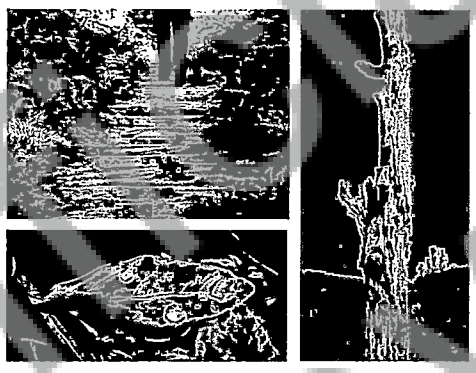
Exhibit 'B'

Fish & Wildlife Habitat Conservation Area Report

Ecological Land Services

CRITICAL AREAS AND FWHCA REPORT

Updated June 9, 2021



Rock Creek Cove Hospitality

Stevenson, Washington

Prepared for

FDM Development
5101 NE 82nd Ave, Suite 200
Vancouver, WA 98662
(210) 849-5592

Prepared by

Ecological Land Services, Inc.

1157 3rd Avenue, Suite 220A • Longview, WA 98632

(360) 578-1371 • Project Number 2682.02

SIGNATURES

This report was prepared by the undersigned:

Andrew R. Allison
Senior Wetland Scientist, Principal
Ecological Land Services, Inc.

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WDFW's "Living with Wildlife: Canada Geese"

Introduction

Ecological Land Services (ELS) has prepared the following critical areas report and compensatory mitigation plan for FDM Development (the applicant) as a component of the proposed mixed-use hospitality development adjacent to Rock Creek Cove on parcels 02070100130300, 02070100130400, and 02070100130200 (study area) in the City of Stevenson, Skamania County, Washington. The study area is in the SW ¼ of the NW ¼ of Section 1, Township 2 N, and Range 7 East of the Willamette Meridian, coordinates 45.6890, -121.8992, and is accessed from SW Rock Cove Dr (Figure 1). The study area's zoning is "Commercial" (C1). This report provides a description of existing critical areas on the proposed development site, a summary of proposed impacts from development, and a mitigation proposal for unavoidable impacts.

SMC 18.13.050 - Critical areas report requirements

A. Qualified Professional. When required by this chapter, the applicant shall submit a critical area report prepared by or under the direct supervision of a qualified professional as defined herein.[1]

> Ecological Land Services Inc. (ELS) is an environmental consulting firm with twenty-four years' experience specializing in natural resources management and land use planning. Andrew Allison has been employed by ELS for 9 years and has a total of 12 years' experience in critical areas analyses that include habitat associated with wetlands, streams, woodlands, and agriculture. He has completed critical areas assessments, prepared critical area determination reports, and designed wetland and habitat mitigation plans in Southeast Alaska, Washington, and Oregon that include urban, rural, and wilderness environments.

B. Best Available Science. The critical area report shall use scientifically valid methods and studies in the analysis of critical area data and field reconnaissance and reference the source of science used. The critical area report shall evaluate the proposal and all probable impacts to critical areas in accordance with the provisions of this chapter.

> Stream Assessment:
> ELS uses guidance provided by the Washington State Department of Ecology[2] (Ecology) and the U.S. Environmental Protection Agency[3] (EPA) to inform decisions about the location of an ordinary high water mark (OHWM) and to make determinations about stream characteristics, including habitat functions and flow dynamics. The Shoreline Management Act (SMA) of Washington State defines OHWM as a mark "...found by

1 "Qualified professional" means a person with experience and training in accordance with WAC 365-195-905(4).
[2] Publication No. 16-06-029: "Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State", revised October 2016.
[3] Publication No. 910-K-14-001: "Streamflow Duration Assessment Method for the Pacific Northwest", November 2015.

examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland..." (RCW 90.58.030(2)). ELS, in collaboration with Ecology staff, used principles in this guidance as well as site-specific indicators to identify the OWHM of the Columbia River within the study area boundary. Site specific indicators included transitions in vegetation, wrack lines, scouring under trees and exposed roots, and breaks in topography.

Wetland Assessment:

ELS follows the Routine Determination Method developed by the U.S. Army Corps of Engineers (Corps) for wetland delineation.[4] The Routine Determination Method examines vegetation, soils, and hydrology to determine if wetland is present. EPA defines wetlands as "...areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

C. Minimum Report Contents. At a minimum, the report shall contain the following:

1. The name and contact information of the applicant and landowner (if different).

Applicant:	Landowners (represented by the applicant):
FDM Development, Inc.	Erwin L&K, LLC
5101 NE 82nd Ave, Suite 200	OPH DBD, LLC
Vancouver, WA 98662	Rawlings Family Investments, LLC
(210) 849-5592	

2. The street address and tax lot number of the site proposed for the regulated activity.

Parcel Numbers:	02070100130200, 02070100130300, 02070100130400
Map Number:	U-CR-P
Site Address:	Rock Creek Dr.
Description:	Lot 2 BK T/PG 100
Total Acreage	6.40
Zoning:	Commercial Recreation (CR)

3. A description of the proposal and identification of the permit requested.

Rock Creek Cove Hospitality project is a mixed-use development adjacent to Rock Creek Cove on the former Hegewald Lumber Mill Site in Stevenson, WA. The project seeks to

[4] "Corps of Engineers Wetlands Delineation Manual", Wetlands Research Program Technical Report Y-87-1 (Environmental Laboratory 1987) and the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)" (U.S. Army Corps of Engineers, May 2010)

complement the existing tourism industry in Stevenson by offering condo- and studio-sized units available for nightly and weekly rental, totaling 48 available bedrooms. A 15,000 square-foot commercial venue space will anchor the development and provide wide views of Rock Creek Cove and the Columbia River Gorge. The conceptual space planning of the commercial building consists of 5,000 open venue space, supported by 10,000 square feet of service, food preparation, and guest lounging area. The development seeks to attract both local and regional visitors, with venue space available for weddings, company parties, family reunions, and corporate retreats.

The project is proposed in three phases of development: Phase 1 includes condo-style units, operated by a single ownership group. Phase 2 will add the commercial venue space and restore water-side portions of the property for enhanced, publicly-accessible observation and enjoyment. Phase 3 completes the development with the studio-sized units, operated under the same ownership group as the remainder of the property.

The applicant is seeking a Critical Areas Permit from the City of Stevenson for an approximate 0.18-acre impact to the Columbia River's fish and wildlife habitat conservation area (FWHCA) (Figure 3).

4. A detailed plan of the proposal site and all adjoining areas within 100 feet, drawn to a standard engineering scale and submitted on 8 ½"×11" or 11"×17" paper.

The existing and proposed conditions are included with this report as Figures 2, 3, and 4. Its scale is 1:200 and it is on 11x17 paper. These figures include:

a. location and description of critical areas and buffers
b. existing conditions of the property
c. location, species, and diameter of significant trees
d. location and extent of proposed regulated activities

Details related to stormwater management are included in the engineer's drawing, included with this report's Appendix.

5. The dates, names, and qualifications of the persons preparing the report and documentation of any fieldwork performed on the site.

ELS (Andrew Allison, qualifications provided above) and Ecology (Rebecca Rothwell, Wetlands and Shorelands Technical and Regulatory Lead) completed fieldwork on December 30, 2019. We assessed critical areas and fish and wildlife habitat in the study area together, and physically demarcated the OHWM of the Columbia River in the study area using consecutively numbered fluorescent tape flagging. S&F Land Services, a

professional surveyor, recorded the flag locations on the same day. ELS and Ecology agreed wetlands were not present in the study area.[5]

6. Identification and characterization of all critical areas, wetlands, water bodies, and buffers adjacent to the proposed project area. For areas off site, estimate conditions within 300 feet of the project boundaries using the best available information.

ELS and Ecology identified one unnamed tributary to the Columbia River at the north end of the study area; the tributary is designated "Type F" by Washington Department of Natural Resources (DNR) (Figure 6). The Columbia River is designated "Type S" and is a shoreline of statewide significance. Rock Cove, a side channel of the Columbia River, surrounds the study area on three sides (Figures 2 and 3). According to SMC 18.13.095(D), the area designated as a fish and wildlife habitat conservation area (FWHCA) for Type F waters is 100 feet and Type S waters is 150 feet.[6] Existing conditions within 300 feet of the study area include SW Rock Creek Drive and single family residences to the west, an assisted living community to the south, and Rock Cove (open water) to the north and east.

Vegetation in the study area's FWHCA consists of mature deciduous and evergreen trees spaced along the north, east, and southwest shoreline with an understory of woody shrubs and herbaceous species. Shrub species are best established between the study area and SW Rock Creek Drive, roughly the northwest and southeast portions of the subject shoreline; elsewhere, shrubs and herbaceous vegetation are sparse or absent due to existing impervious surfaces, riprapped embankments, and historic disturbances from industrial activities that include uses by the timber industry and municipal materials storage. Approximately 70 percent of the study area's shoreline is armored with riprap-like material that consists of loose stones, gravel, fragments of concrete, and large pieces of metal (i.e. rebar, logging cable, nonspecific steel remnants). Derelict pilings are located a few feet offshore near the northeast portion of the study area.

In most places the transition from top-of-bank to the OHWM is relatively steep. Erosion control in the steeper portions of the shoreline has been historically achieved with riprap-like armoring. Approximately 65 percent of the shoreline is armored with material that consists of loose stones, gravel, fragments of concrete, and large pieces of metal (i.e. rebar, logging cable, and non-specific steel remnants). Derelict in-water pilings are located along the southeast shoreline of the study area and formerly supported timber industry infrastructure.

[5] The National Wetlands Inventory (NWI) maps one wetland in the study area, identified as PEM1/UBFh (Figure 7). ELS and Ecology reviewed the area mapped as wetland by the NWI and determined it is part of Rock Cove, within the OHWM of the Columbia River, and not an independent wetland unit.
[6] Table 18.13.095-1

7. *A statement specifying the accuracy of the report, and all assumptions made and relied upon.*

ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies will agree with our determinations; however, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

8. A discussion of the regulatory standards applicable to the critical areas and proposed activities.

Regulatory standards that apply to the applicant's proposed development include compliance with the City of Stevenson's December 2018 Shoreline Master Program (SMP), and SMC Chapter 18.13 *Critical areas and natural resource lands.*

a. SMP requirements: The standard shoreline management area (or shoreline setback) for all designated shorelines in Washington State is 200 feet, measured landward from the OHWM. The study area is zoned "active waterfront"; according to Stevenson's 2018 SMP, setbacks for development proposed in active waterfront is typically 50 feet. Accordingly, the applicant is keeping all development outside of the 50-foot setback as demonstrated in Figure 3.

   Regarding improvements from prior industrial land uses including concrete and gravel surfaces, gravel roads, the graveled boat launch, and riprap embankments, a shoreline use that was lawfully constructed prior to the effective date of the SMA or the December 2018 SMP and that does not conform to the current SMP standards is considered a nonconforming use. For the purposes of the December 2018 SMP, existing roads (whether asphalt, gravel, or dirt) are considered nonconforming uses and do not need a Shoreline Conditional Use Permit to be retained or improved (SMP 2018).

b. This report is a discussion of all other regulatory standards applicable to SMC Chapter 18.13 *Critical areas and natural resource lands*.

9. A description of efforts to apply mitigation sequencing pursuant to SMC 18.13.055 specific to avoidance, minimization, compensation, and preservation measures proposed for the critical areas.

Rock Creek Cove Hospitality is proposed on the former Hegewald Lumber Mill Site which was active from the 1950's through the 1970's. The Natural Resource Conservation

Service (NRCS) describes soils in the study area as Arents 0 to 5 percent slopes. Arents do not have diagnostic horizons because they have been deeply mixed by plowing, spading, or other methods of moving by humans (NRCS 2020). Existing conditions indicate the site's history of disturbance from industrial timber processing; these conditions can be roughly categorized as impervious surface, disturbed/maintained pervious surfaces, and moderately vegetated shoreline.

Impervious surface occupies approximately 1.25 acres and consists of compacted gravel, asphalt, or concrete formerly used for roads, staging pads, or parking areas, and a boat launch. Disturbed/maintained pervious surfaces occupy approximately 4 acres are characterized by areas with little to no plant cover, low plant species diversity, and that have stockpiles of rock or woody materials. Moderately vegetated shoreline occupies approximately 1.22 acres. These areas show signs of prior industrial land use but have not been maintained and, in the absence of maintenance, reestablished trees and shrubs with moderate levels of diversity and interspersion. Critical areas in the study area are the FWHCA for Rock Cove and the unnamed tributary to Rock Cove, and one Oregon white oak tree (Figure 2). The FWHCA is primarily within moderately vegetated shoreline.

In adherence to mitigation sequencing pursuant to SMC 18.13.055 and with specificity to avoidance, the applicant is proposing most development in areas that are either existing impervious surfaces, previously disturbed ground, or that are otherwise prevented from providing buffer functions by shoreline armoring (Figures 2, 3, and 4). Pursuant to minimization, the applicant is proposing a 0.18-acre impact to Rock Cove's FWHCA in the southwest portion of the study area in a part of the buffer that, in addition to prior industrial land use, was used for storing rock, cobbles, and other materials until sometime after 2007 (Figure 4, 2007 aerial base map). The proposed impact area meets the definition of a "degraded" buffer as it is defined in SMC 18.13.010(B)(15).[7] Proposed mitigation for these impacts is discussed below in the requirements for FWHCA reports, SMC 18.13.095(F) *Habitat Mitigation*.

10. Any additional information required for the critical area as specified in the corresponding section.

SMC 18.13.095(D)(3) identifies functionally isolated buffer as lawns, pre-existing roads and structures, vertical separation, and other areas that do not protect the FWHCA from adverse impacts. Shoreline armoring meets the description of a preexisting structure that that does afford protection from adverse impacts. It lacks pervious surfacing for detaining and/or filtering sediment loads in surface runoff, an established and diverse native

[7] Areas of the FWHCA that are dominated by more than 30 percent aerial coverage of invasive vegetation (primarily Himalayan blackberry (*Rubus armeniacus*)) and/or by fill, gravel, debris, asphalt, and other non-native material.

vegetation community able to provide forage, screening, refuge, or denning opportunities for wildlife species, and over-water shading for near-shore aquatic wildlife in the Columbia River. Accordingly, those portions of the study area that contain armoring satisfy the buffer exemption criteria per SMC 18.13.095(B)(3) (Figure 2). [8] Additional areas of buffer isolation are located near the entryway to the study area from Rock Creek Drive and consist of maintained vegetation adjacent to impervious surfaces (Figure 2).

SMC 18.13.095 - Fish and wildlife habitat conservation areas

C. FWHCA Reports

1. In order to determine the extent of the appropriate buffers on a site when the nature of the fish and wildlife habitat conservation area is unclear, the applicant may submit a preliminary habitat assessment report as prepared by a qualified professional.

ELS prepared a critical areas' report and conceptual mitigation plan for the preliminary review of this application, dated June 16, 2020. The city's environmental consultant, Olson Environmental LLC (OE), provided review and comments on this report dated June 17, 2020. OE's findings for the preliminary report concur with FWHCA buffer isolation. A copy of ELS's preliminary report and OE's findings letter is included with this report for reference (Appendix).

In addition to the minimum requirements for critical area reports contained in SMC 18.13.050, a preliminary FWHCA report should also contain the following information:

a. Confirmation or correction of the classifications for the FWHCA and/or stream type as defined in this chapter.

ELS confirms there are FWHCAs in the study area for the unnamed tributary to Rock Cove (Type F) and for Rock Cove, a side channel of the Columbia River (Type S). ELS does not recommend revising the stream types or the FWHCA classifications.

b. Characterization of riparian vegetation species, composition, and habitat function.

Vegetation in Rock Cove's FWHCA consists of mature deciduous and evergreen trees spaced along the north, east, and southwest shoreline with an understory of woody shrubs and herbaceous species. Tree species include red alder (*Alnus rubra*), Douglas fir (*Pseudotsuga menziesii*), black cottonwood (*Populus trichocarpa*), and one Oregon white oak (*Quercus garryana*). Shrub species were best established between the study area and SW Rock Creek Drive, roughly the northwest and southeast portions of the subject

[8] Armoring occupies approximately 65 percent of the shoreline. The remaining 25 percent is moderately well vegetated; moderately well vegetated areas are the northwest and southwest potions of the site (Figure 2).

shoreline; elsewhere, shrubs and herbaceous vegetation are sparse or absent due to existing impervious surfaces, riprapped embankments, and historic disturbances from industrial activities that include uses by the timber industry and municipal materials storage. Shrub species include common snowberry (*Symphoricarpos albus*), beaked hazelnut (*Corylus cornuta*), spirea (*Spiraea douglasii*), and Himalayan blackberry (*Rubus armeniacus*). Himalayan blackberry is common throughout Rock Cove's FWHCA. Herbaceous vegetation was primarily established in the transition zone above and below OHWM with reed canarygrass (*Phalaris arundinacea*), soft rush (*Juncus effuses*), dogwood (*Cornus sericea*), and spirea rooted at or below ordinary high and common grasses rooted above.

A small portion of the study area intersects with the FWHCA for the unnamed tributary in the northwest corner adjacent to SW Rock Creek Dr. Vegetation at this intersection point is characterized by a canopy and understory as discussed above for Rock Cove.

c. Description of the soil types adjacent to and underlying the stream, using the Soil Conservation Service soil classification system.

ELS uses the Natural Resource Conservation Service (NRCS) map unit descriptions to gather baseline soil data. NRCS identifies soils in the study area as Arents 0 to 5 percent slopes. Arents is described by NRCS as a well-drained, terraced soil with more than 80 inches depth to the groundwater table. A typical profile includes gravelly sandy loam from 0 to 24 inches and extremely gravelly sandy loam between 24 and 60 inches. As mentioned previously, Arents do not have diagnostic horizons because they have been deeply mixed by plowing, spading, or other methods of moving by humans (NRCS 2020). ELS did not collect soils data additional to the existing NRCS mapping data due to the prevalence of impervious and disturbed soil conditions, and consensus with Ecology that collecting soils data to demonstrate the absence of wetlands was not necessary for Ecology's purposes in the study area.

d. Identification of the qualities of the area that are essential to maintain feeding, breeding, and nesting, and an assessment of potential project impacts to the use of the site by the species.

Some of the study area's northern and southern FWHCA, as well as the entirety of Rock Cove, is identified by Washington Department of Fish and Wildlife's (WDFW) Priority Habitat and Species (PHS) mapping as a breeding area for Canadian geese (*Branta canadensis*) (Figure 9). Rock Cove is also identified by PHS as providing habitat for resident coastal cutthroat (*Oncorhynchus clarki*), Fall Chinook (*Oncorhynchus tshawytscha*), Winter Steelhead (*Oncorhynchus mykiss*), and rainbow trout (*Oncorhynchus mykiss*) (WDFW 2020) (Figure 9). Canada geese are not sensitive, threatened, or endangered, and FWHCA in the study area does not provide habitat that

is unique, important, or necessary for the species. As stated by WDFW, "...northwest Oregon and southwest Washington are now wintering more Canada geese than at any other time in recorded history" (WDFW 2015). ELS did not observe goose nests in the study area, or evidence that geese use the site (tracks, feathers, and droppings were absent). The applicant is not proposing in-water work or work within 50 feet of the OHWM; accordingly, there are no anticipated impacts to fish or Canada geese from the proposed development.

The study area is in a northern spotted owl management buffer. Spotted owl habitat usually consists of mature and old-growth coniferous forests with high canopy cover, trees of varying sizes, snags, and large downed wood (Buchanan, J.B. 2016). Suitable old-growth forests are approximately 150-200 years old. The study area and surrounding properties are managed for timber production; consequently, they do not meet criteria for spotted owl habitat.

e. A discussion of any federal, state, or local species/habitat management recommendations, including the WDFW habitat management recommendations that have been developed for the identified species or habitat.

There are no specific management recommendations for Canada geese as regards the success of the species. WDFW published a document titled "Living with Wildlife: Canada Geese" in 2005. This document in referenced in WDFW's Priority Habitat and Species List published in 2008 and updated in February 2020. The document provides options for coexisting with geese and resolving conflicts that arise between geese and human land uses, resulting from populations of resident Canada geese "...dramatically increas[ing] over the past 25 years, particularly in urban areas where there are few predators, prohibitions on hunting, and a dependable year-round supply of food and water" (WDFW 2005). A copy of this document in included in the Appendix of the report for reference.

The applicant is not proposing in-water work or work within 50 feet of the OHWM; accordingly, there are no anticipated impacts to fish. The applicant will follow appropriate BMPs during construction and meet the requirements outlined in Ecology's Stormwater Management Manual for Western Washington (Ecology 2019) to further ensure Rock Cove does not receive sediment, surface runoff, or any other input that would potentially affect water quality or fish habitat as a result of project construction.

f. Recent photographs of the property, including detailed photographs of the habitat resource in question.

On-the-ground color photographs of the study area taken by ELS in December 2019 are included with this report (Photoplates, Appendix).

g. An outline of standard buffer widths, available buffer reductions, or potential opportunities for enhancement/mitigation.

SMC 18.13.095(D) identifies the FWHCA for Type F waters as 100 feet and Type S waters as 150 feet. There are no proposed buffer reductions for this project, which is a revision from the preliminary critical areas report and conceptual mitigation plan prepared by ELS and reviewed by OE. After reviewing OE's findings letter with the applicant and OE's representative, and reviewing SMC 18.13, ELS concluded that eliminating buffer reduction from the proposal increases the amount of buffer enhancement available for mitigating the proposed buffer impact onsite. With the standard 150-foot FWHCA applied and adjusted for functional isolating features, the applicant is proposing approximately 0.18-acre buffer impact (Figures 3 and 4). Impacts include permanent development in a portion of the buffer that is already degraded from historic land uses. As mitigation, the applicant is proposing approximately 1.12 acres of buffer enhancement by densely planting the remaining buffer area with native shrubs and removing non-native invasive Himalayan blackberry, a dominant invasive plant in the study area. Blackberry removal and shrub installation will increase native plant diversity, improve habitat opportunities for a variety of native birds and mammals (both water-dependent and terrestrial), increase foraging value, and decrease opportunities for non-native plants and animals to occupy the site. The proposed mitigation is in-kind buffer enhancement at a 6.2:1 ratio, exceeding the 1:1 enhancement ratio requirement for onsite FWHCA mitigation per SMC 18.13.095-3.

SMC 18.13.095(F) - Habitat mitigation

1. Compensatory mitigation for impacts to FWHCA's shall achieve equivalent or greater functions as those affected by the proposed project.

The proposed FWHCA enhancement increases the existing buffer functions and values.

2. FWHCA Mitigation Plan. When a project involves FWHCA or FWHCA buffer impacts, enhancements, or reductions, a habitat mitigation plan by a qualified professional shall be required. At a minimum, the habitat mitigation plan must contain the following information:

a. All the information required in the FWHCA Report prepared under SMC 18.13.095(C).

The report is a fulfillment of this requirement.

b. A copy of the site plan for the development proposal.

The site plan is included in Figures 3 and 4, and in the engineer's drawing in the Appendix.

c. *A description of the mitigation sequence developed for the project according to SMC 18.13.055.*

Please refer to item 9, page 5 of the report for the discussion of the applicant's mitigation sequencing.

i. *Existing conditions of the enhancement area, including location:*

The proposed enhancement areas are a combination of moderately vegetated shoreline and previously disturbed ground at the north and south ends of the study area (Figures 3 and 4). These are portions of the FWHCA that have not been regularly maintained or have been minimally maintained during the last 10 to 15 years, and longer in some places. Existing tree species include red alder, Douglas fir, and black cottonwood; cottonwood and alder are closer to the OHWM, fir is mid-slope to top-of-bank. Shrub species are sparsely to moderately interspersed under tree canopy and include common snowberry, beaked hazelnut, and Himalayan blackberry.

ii. *Rational for site selection*

The study area's history of industrial use provides an opportunity for onsite habitat improvement. The areas selected for improvement have existing canopy cover, lack armored shoreline, and are adjacent to sheltered coves formed by the topographic configuration of the study area. The existing canopy cover provides cooler temperatures and higher, more consistent soil moisture for installed native shrubs, and will help minimize potential regrowth of Himalayan blackberry through shading. The absence of shoreline armoring increases soil availability for installed plants' root establishment, decreases the amount of time and equipment necessary to prepare the site for enhancement, which together improves the overall likelihood that installed plants will succeed quickly. Lastly, sheltered coves provide unique attributes that increase habitat potential: they are more secluded than other parts of the study area's shoreline, both from natural elements such as wind and wave action, as well as minimizing future opportunities for human disturbance through topographic positioning; they have shallower water levels and consequently provide greater accessibility to habitats for birds, terrestrial mammals, and water-dependent species; and they have increased opportunity to provide off-channel salmonid habitat which would be improved by the proposed riparian vegetation enhancement.

iii. *Estimated future condition of the enhancement area*

Successful riparian vegetation enhancement will include a diverse native shrub understory, the absence or minimal presence of Himalayan blackberry (less than 10 percent cover), and evidence of frequent or ongoing seasonal native wildlife use.

iv. An assessment of all appropriate technical information necessary to assess the compensatory mitigation proposed.

This report is a fulfilment of the requirement.

d. The environmental goals and objectives of the mitigation

SMC 18.13.059 - Performance and monitoring standards

The goal of FWHCA enhancement is to provide high quality riparian habitat functions onsite using the following objectives and performance standards:

Objective 1. Provide high quality riparian habitat functions onsite.

- *Performance Standard 1a.* Enhance 1.12 acres of existing, moderately to poorly functioning FWHCA onsite. This performance standard is completed when the enhancement area is documented in the Year 1 Monitoring Report.
- *Performance Standard 1b.* Remove non-native invasive Himalayan blackberry from the enhancement site and areas adjacent to the enhancement site.
- *Performance Standard 1c.* Plant native shrubs trees and open areas in the understory and in areas formerly occupied by Himalayan blackberry. Plantings will achieve 100 percent survival in Year 1. Dead plants will be replaced if this performance standard is not met.
- *Performance Standard 1d.* Native shrubs will achieve at least 90 percent survival in Year 2. Dead plants will be replaced if this performance standard is not met.
- *Performance Standard 1e.* Native shrubs will achieve at least 80 percent survival in Year 3. Dead plants will be replaced if this performance standard is not met.
- *Performance Standard 1f.* Native shrubs will achieve at least 75 percent survival in Year 5. Dead plants will be replaced if this performance standard is not met.
- *Performance Standard 1g.* In all years, non-native invasive plant species will not exceed 10 percent cover in the enhancement area.

- *Performance Standard 1h.* In all years, native volunteer plants will be included in the survival calculation. If an installed plant dies and a volunteer plant emerges, the survival standard will be met.

Objective 2. Provide signage between the enhancement area and the development.

- *Performance Standard 2a.* Install FWHCA signs at a minimum of 50-foot intervals along the perimeter of the enhancement area facing the proposed development. This performance standard is complete when signs are installed and documented in a monitoring report.
- *Performance Standard 2b.* Install natural barriers where needed around the perimeters of the enhancement area. The need for barriers may not be apparent until after the development is complete. If needed/required, this performance standard is complete when the natural barriers are installed and documented in a monitoring report or memo.

Objective 3. Provide legally binding protection for the enhancement area.

- *Performance Standard 3a.* A conservation covenant or similar legal mechanism will be established for the enhancement area. The performance standard is complete when the City of Stevenson approves the conservation covenant or similar legal mechanism.

Planting schedule and equipment

Native shrubs will be installed in late winter or early spring when the plants are dormant, and the soil moisture conditions are favorable for planting. The following equipment may be used to prepare and install plants in the enhancement area: tree shovel, garden shovel, and power auger. Heavy equipment is not anticipated to be necessary unless remnants of industrial materials are discovered while planting and removal of such material is determined to be beneficial to enhancement goals.

Table 1: Proposed enhancement plants

Common Name/Botanical Name	Size	Spacing	Quantity
Vine maple, *Acer circinatum*	1 gallon	6-10 feet	100
Western service berry, *Amelanchier alnifolia*	1 gallon	6-10 feet	100
Oceanspray, *Holodiscus discolor*	1 gallon	6-10 feet	100
Tall Oregon grape, *Mahonia aquifolium*	1 gallon	6-10 feet	100
Common snowberry, *Symphoricarpos albus*	1 gallon	6-10 feet	100
Sword fern, *Polystichum munitum*	1 gallon	6-10 feet	100
		Total	**600**

Specifications for site preparation, planting, and maintenance

Preparing the enhancement area

- Install silt fencing where necessary to control runoff from the development.
- Install temporary construction fencing along the perimeters of the enhancement area bordering the development.
- Remove Himalayan blackberry. Selectively apply herbicide as necessary.

Installing habitat signs

- Install durable signs at a minimum of 50-foot intervals on metal or wood posts where the enhancement area is adjacent to proposed development.

General plant specifications

- Plant the native shrubs during the late winter or early spring at the spacing identified in Table 1.
- Group the plants in uneven patches dominated by a single species or interspersed with one another where no shrubs currently exist.
- All plant materials will be kept cool and moist prior to installation.
- All plant materials will have well developed roots and sturdy stems, with an appropriate root to shoot ratio.
- No damaged or desiccated roots or diseased plants will be accepted.

Planting shrubs

- Dig the receiving hole several inches wider than the size of the root system.
- Position the planted species' root collar so that they are at or slightly above the level of the surrounding soil to allow for settling.
- Back the hole with soil.
- Gently compact the soil around the planted species to eliminate air spaces.
- Install a minimum of 3-inch depth by 4-foot diameter mulch layer around the base of planted species. The mulch will be comprised of clean, chipped wood. Avoid placing mulch directly against plant stems.
- Irrigate all newly installed plants as site and weather conditions warrant.

e. A monitoring and maintenance proposal compliant with SMC 18.13.059

ELS recommends a 5-year monitoring and maintenance schedule in accordance with SMC 18.13.059(E)(1). Monitoring will begin the first growing season after the enhancement area is planted. Annual reports will be submitted to the City of Stevenson by December 31 of each monitoring year.

Monitoring plots

During the first annual monitoring event, monitoring plots will be established as follows:

1. A minimum of two permanent monitoring plots will be established, one in each enhancement area. Monitoring plots will be staked and identified with an aluminum tag, their location will be recorded with GPS, and they will be included on the as-built site map that accompanies each monitoring report. Photo points will be taken at the monitoring plots and elsewhere as needed to accurately document conditions.

Vegetation

Vegetation monitoring will measure the following:

1. Percent aerial cover of planted and naturally recruiting native trees and shrubs
2. Percent aerial cover of non-native, invasive plants
3. Change in the plant community over time (from photo points)

Fauna

Wildlife documentation will include the following:

1. Evidence of bird use (nesting, tree excavation, tracks in shoreline sediments, etc.)
2. Evidence of mammal use (scat, tracks, shedding hair or antlers, browse, bedding, denning, etc.)

Monitoring reports

The annual monitoring reports will contain at least the following:

- Location map and as-built map, and a revised plant quantity table as needed
- Description of monitoring methods
- Documentation of the presence and legibility of FWHCA signs
- Documentation of plant survival and cover
- Assessment of non-native, invasive plant species and recommendations for management
- Observations of wildlife
- Site photographs
- Summary of maintenance and contingency measures proposed for the next season and completed for the past season.

Enhancement area maintenance

Maintenance includes the following:

- Inspect the plants at least once annually, or more often as appropriate, and maintain to achieve the performance standards.
- Irrigate as-needed.
- Replace mulch as needed.
- Replace dead or failed plants to meet the minimum annual performance standards. Replaced plants will be installed as described for the original installation.
- Implementing a fertilizing schedule.
- Repairing damaged limbs or pruning dead branches.

Responsible parties

The Applicant, their successors, and/or their designee will be responsible for implementing the enhancement plan and its maintenance and monitoring. If the performance standards are not met by Year 5 an adaptive management plan will be developed and implemented. All adaptive management actions will be undertaken only after consulting with and gaining approval from the City of Stevenson. The responsible party will complete an adaptive management plan that describes 1) the need for adaptive management, 2) proposed actions, 3) time-frame for completing actions, and 4) any additional maintenance and monitoring necessary.

f. A bond estimate for the entire enhancement and/or compensatory mitigation project per SMC 18.13.059 - Performance and monitoring standards.

Table 2 includes the bond estimate for the proposed mitigation project. The estimate assumes initial site preparation and plant installation costs followed by one maintenance and one monitoring trip each year for subsequent years.

Table 2. Bond estimate for the entire enhancement project

Year 1	Year 2	Year 3	Year 5	**Years 1-5**
Plant acquisition and installation $2,500	Annual maintenance $750	Annual maintenance $750	Annual maintenance $750	**Total Estimated Mitigation Cost**
Monitoring report $4,572	Monitoring report $4,572	Monitoring report $4,572	Monitoring report $4,572	
Total = $7,072	Total = $5,322	Total = $5,322	Total = $5,322	**$23,038**

Limitations

As stated in item 7 on page 4, ELS bases this report's determinations on standard scientific methodology and best professional judgment. In our opinion, local, state, and federal regulatory agencies will agree with our determinations; however, the information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the appropriate regulatory agencies. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report. Please contact Andrew Allison by email andrew@eco-land.com or by phone (360) 578-1371 with any questions regarding the contents of this report.

References

City of Stevenson, Council Authorized Draft, Shoreline Master Program. December 2018.

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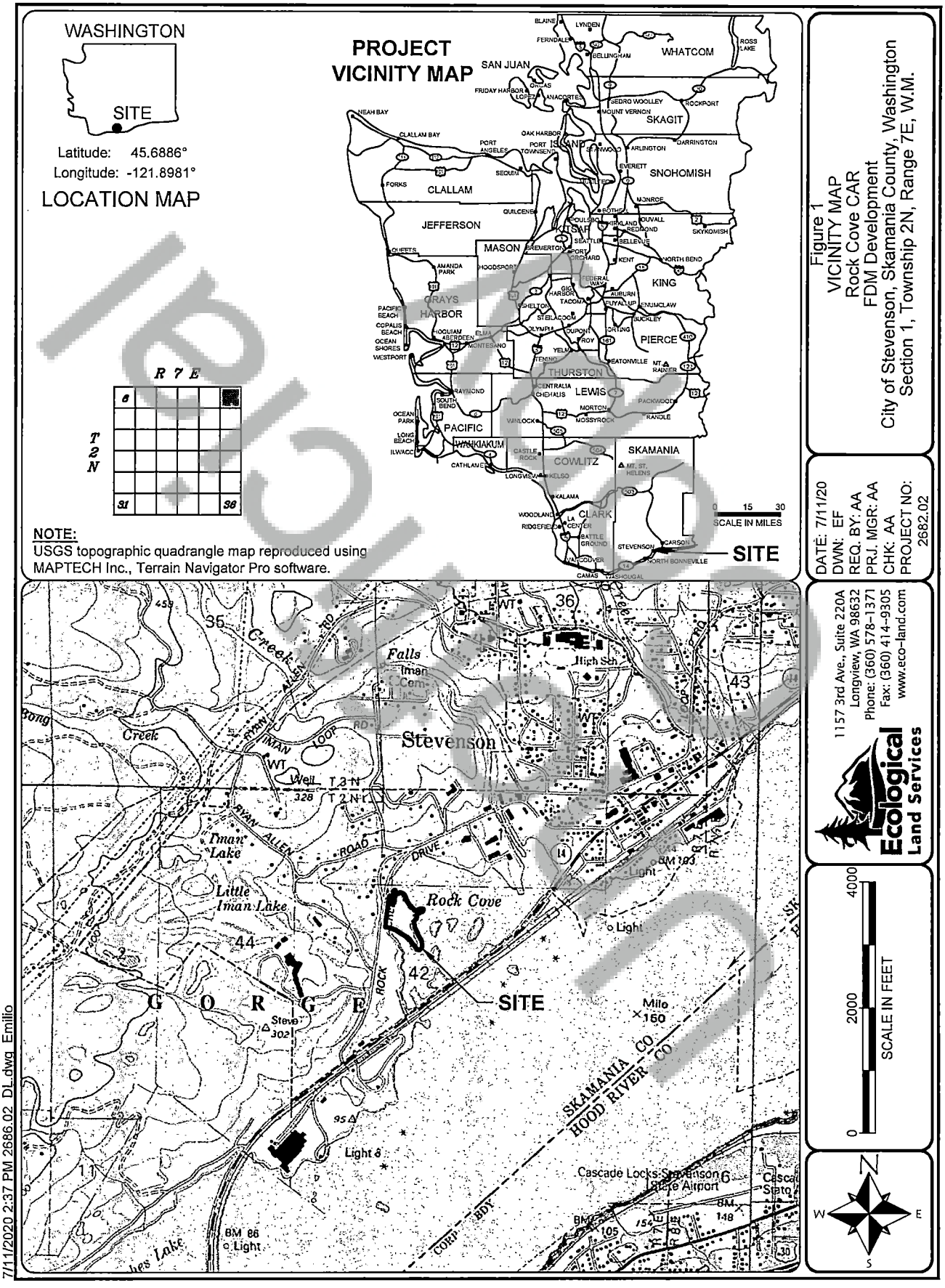

Figure 1
VICINITY MAP
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

DATE: 7/11/20
DWN: EF
REQ. BY: AA
PRJ. MGR: AA
CHK: AA
PROJECT NO: 2682.02

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com
Ecological Land Services

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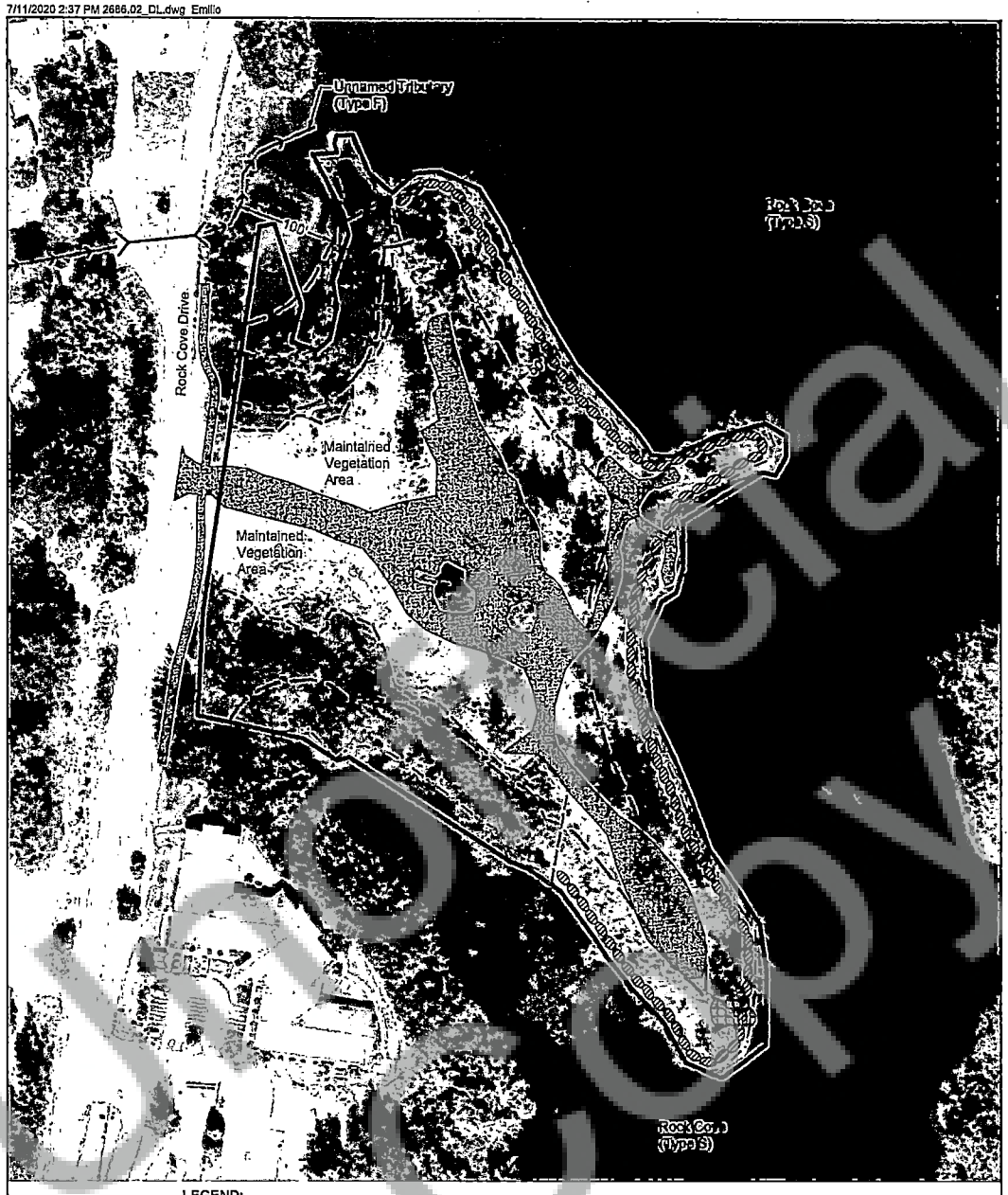

LEGEND:

- Site Boundary
- OHWM
- Stream with Flow Direction
- FWHCA Buffer for Type F
- Functionally Isolated FWHCA Buffer for Type S (150')
- Shoreline Management Plan Setback
- Culvert
- Oak Tree Location
- Existing Graveled or Concrete Surfacing
- Existing Rip Rap

NOTE(S):

1. Aerial from Google Earth™.
2. OHWM line was determined through a joint effort by Ecological Land Services and Washington Department of Ecology on December 30, 2019. OHWM flags were professionally surveyed by S&F Land Services December 30-31, 2019.
3. SMC 18.13.095(D)(3) identifies functionally isolated buffer as lawns, pre-existing roads and structures, vertical separation, and other areas that do not protect the FWHCA from adverse impacts.

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Figure 2
EXISTING CONDITIONS SITE MAP
Rock Cove CAR
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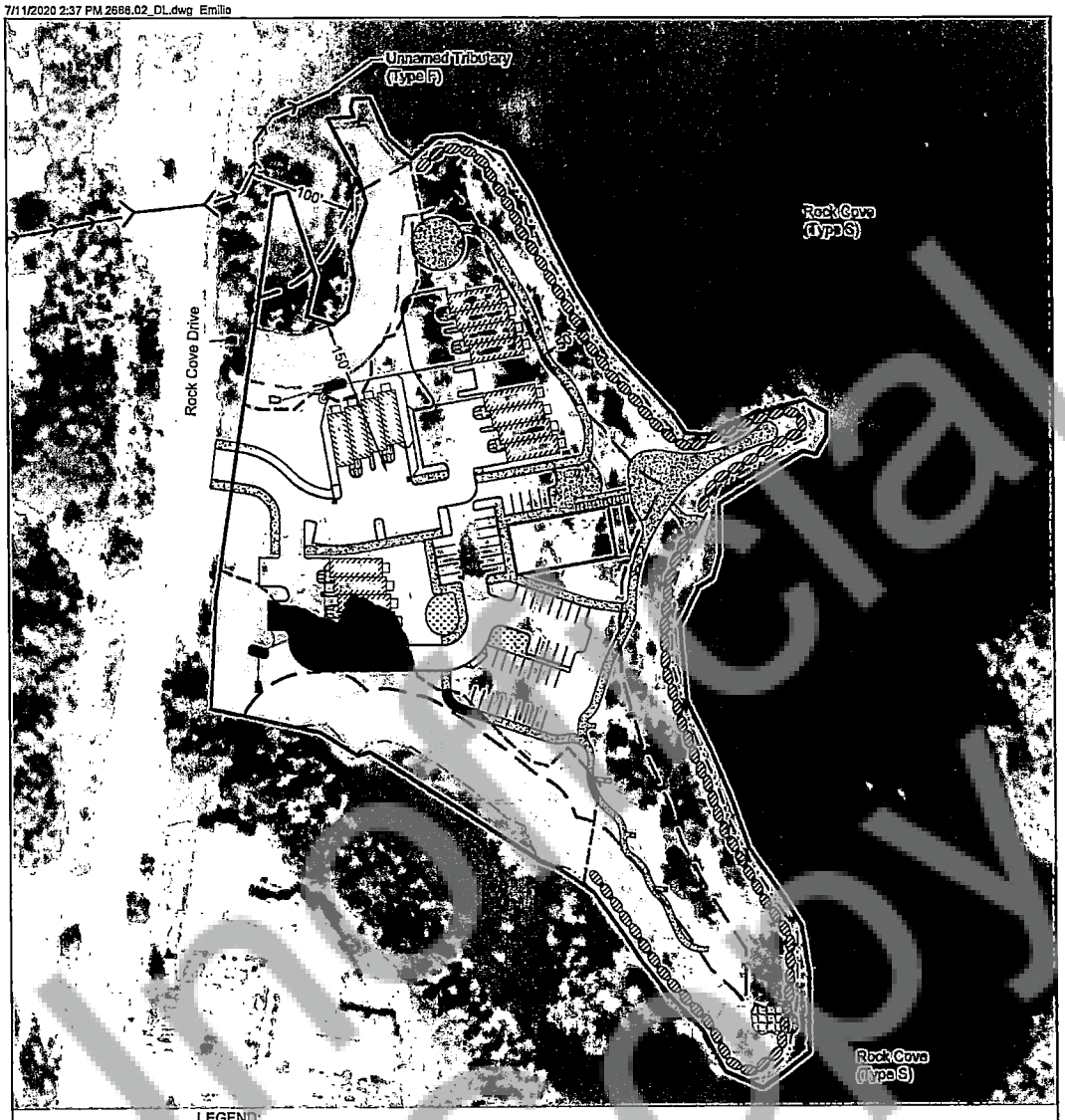

LEGEND:

- Site Boundary
- OHWM
- Stream with Flow Direction
- Functionally Isolated FWHCA Buffer for Type S (150')
- FWHCA Buffer for Type F
- Shoreline Management Plan Setback
- Culvert
- Oak Tree Location
- Proposed Graveled Surfacing
- Proposed Storm Line - Temporary Impact
- Proposed Storm Outfall - Temporary Impact
- Proposed Impacts (0.18 ac.)
- Buffer Enhancement Area (1.12 ac.) (1:6.2 Impact to Enhancement Area Ratio)

NOTE(S):

1. Aerial from Google Earth™. (2018)
2. OHWM line was determined through a joint effort by Ecological Land Services and Washington Department of Ecology on December 30, 2019. OHWM flags were professionally surveyed by S&F Land Services December 30-31, 2019. .
3. Site Plan provided by FDM Development, Inc.
4. SMC 18.13.095(D)(3) identifies functionally isolated buffer as lawns, pre-existing roads and structures, vertical separation, and other areas that do not protect the FWHCA from adverse impacts.

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Figure 3
PROPOSED CONDITIONS - 2018 AERIAL IMAGERY
Rock Cove CAR
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City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

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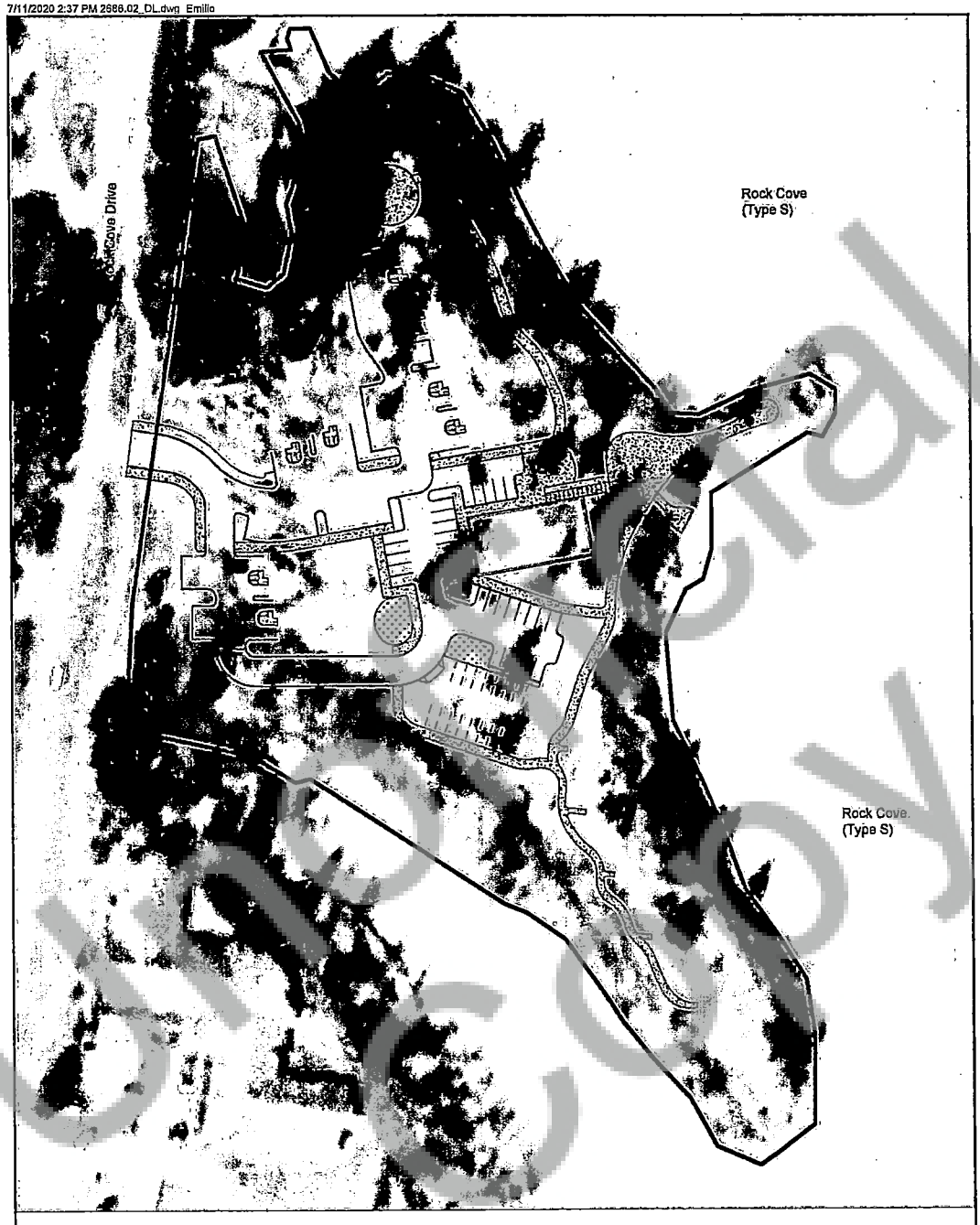

LEGEND:

Site Boundary

NOTE(S):

1. Aerial from Google Earth™. (2007)
2. Site Plan provided by FDM Development, Inc.

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Figure 4
PROPOSED CONDITIONS - 2007 AERIAL IMAGERY
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

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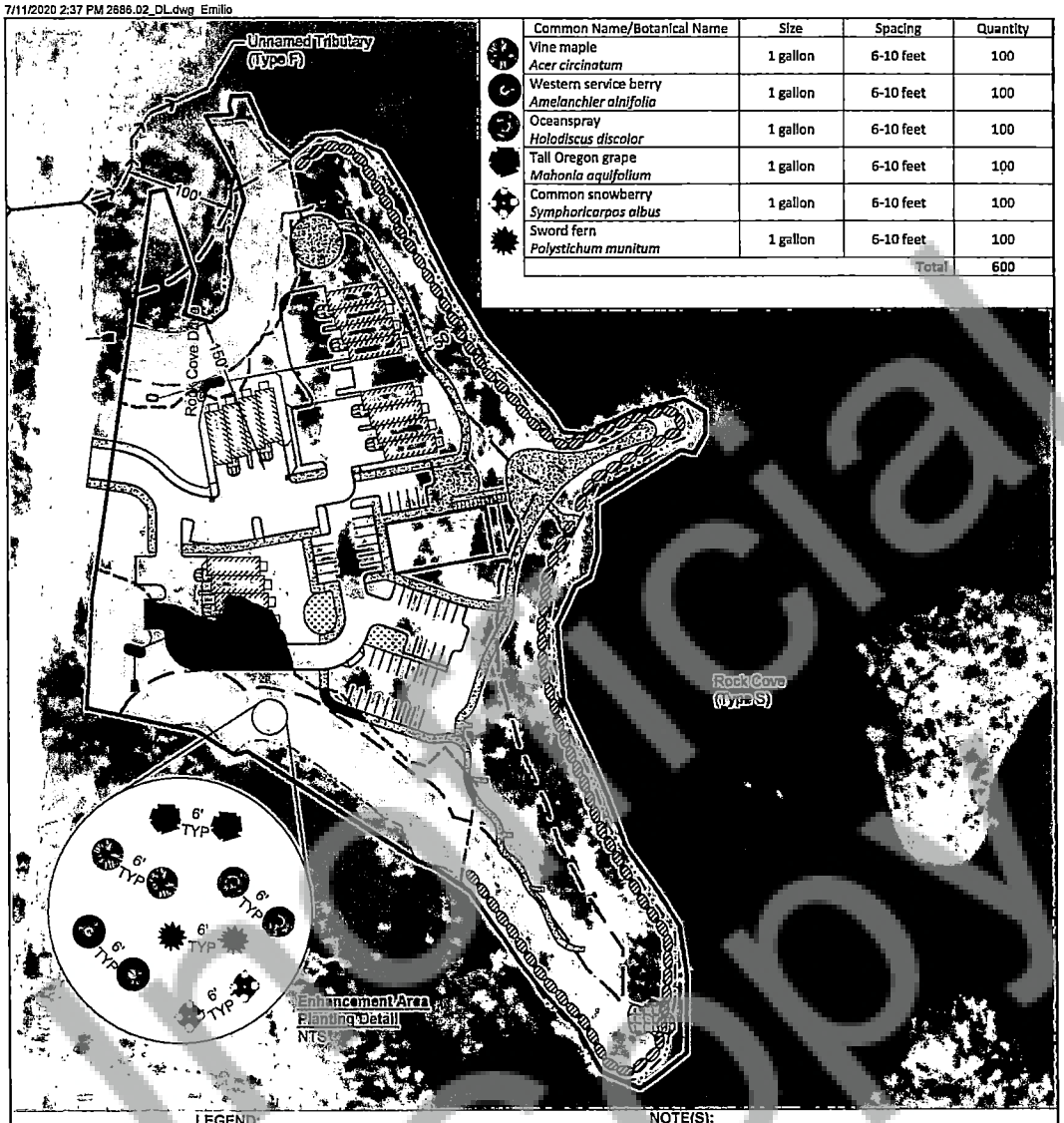

Common Name/Botanical Name	Size	Spacing	Quantity
Vine maple *Acer circinatum*	1 gallon	6-10 feet	100
Western service berry *Amelanchier alnifolia*	1 gallon	6-10 feet	100
Oceanspray *Holodiscus discolor*	1 gallon	6-10 feet	100
Tall Oregon grape *Mahonia aquifolium*	1 gallon	6-10 feet	100
Common snowberry *Symphoricarpos albus*	1 gallon	6-10 feet	100
Sword fern *Polystichum munitum*	1 gallon	6-10 feet	100
		Total	600

LEGEND:

- Site Boundary
- OHWM
- Stream with Flow Direction
- Functionally Isolated FWHCA Buffer for Type S (150')
- FWHCA Buffer for Type F
- Shoreline Management Plan Setback
- Culvert
- Oak Tree Location
- Proposed Graveled Surfacing
- Proposed Storm Line - Temporary Impact
- Proposed Storm Outfall - Temporary Impact
- Proposed Impacts (0.18 ac.)
- Buffer Enhancement Area (1.12 ac.) (1:6.2 Impact to Enhancement Area Ratio)

NOTE(S):

1. Aerial from Google Earth™. (2018)
2. OHWM line was determined through a joint effort by Ecological Land Services and Washington Department of Ecology on December 30, 2019. OHWM flags were professionally surveyed by S&F Land Services December 30-31, 2019. .
3. Site Plan provided by FDM Development, Inc.
4. Plants are not to scale and locations are approximate as shown. Actual planting locations will be determined in the field, with consideration to the listed spacing and density to produce the most natural appearance possible.
5. Himalayan blackberry will be removed from the enhancement area.
6. SMC 18.13.095(D)(3) identifies functionally isolated buffer as lawns, pre-existing roads and structures, vertical separation, and other areas that do not protect the FWHCA from adverse impacts.

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Figure 5
MITIGATION DETAIL
Rock Cove CAR
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LEGEND:

2	Arents, 0 to 5 percent slopes. Not hydric.
17	Bonneville stony sandy loam. Not hydric.
123	Steever stony clay loam, 2 to 30 percent slopes. Not hydric.
177	**Water.**

NOTE(S):

1. Map provided online by NRCS at web address: *http://websoilsurvey.nrcs.usda.gov/app/*

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Figure 6
NRCS SOIL SURVEY
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

Mapped wetlands indicated onsite by US Fish & Wildlife Service.

LEGEND:

- Freshwater Emergent Wetland
- Lake
- Riverine

PEM1Ch	Palustrine, Emergent, Persistent, Seasonally Flooded, Diked/ Impounded.
PEM1/ UBFh	Palustrine, Emergent, Persistent, Unconsolidated Bottom, Semipermanently Flooded, Diked/ Impounded.
L1UBHh	Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/ Impounded.
R4SBC	Riverine, Intermittent, Streambed, Seasonally Flooded.

NOTE(S):

1. Map provided online by US Fish & Wildlife Service at web address: *http://www.fws.gov/wetlands/data/index.html*

Figure 7
NATIONAL WETLANDS INVENTORY
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

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No mapped streams indicated onsite by the Washington State Department of Natural Resources (DNR).

LEGEND:

Streams
Streams
- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

NOTE: Map provided online by Washington State Department of Natural Resources at web address: *https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html*

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Longview, WA 98632
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Fax: (360) 414-9305
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DWN: EF
REQ. BY: AA
PRJ. MGR: AA
CHK: AA
PROJECT NO: 2682.02

Figure 8
DNR STREAM TYPE MAP
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

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LEGEND:

Site Boundary

Bog Clubmoss (Lycopodiella Inundata)

Low Elevation Sphagnum Bog

NOTE: Map provided online by Washington State Department of Natural Resources at web address: *https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html*

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Figure 9
DNR NATURAL HERITAGE MAP
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

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LEGEND:

- Site Boundary
- Priority Habitat and Species (Canada Goose, Northern Spotted Owl, Waterfowl Concentrations)
- Resident Coastal Cutthroat (Oncorhynchus clarki), Fall Chinook (Oncorhynchus tshawytscha), Winter Steelhead (Oncorhynchus mykiss), and Rainbow Trout (Oncorhynchus mykiss)

NOTE: Map provided online by Washington State Department of Fish and Wildlife at web address: https://geodataservices.wdfw.wa.gov/hp/phs/

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Figure 10
PRIORITY HABITAT AND SPECIES
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

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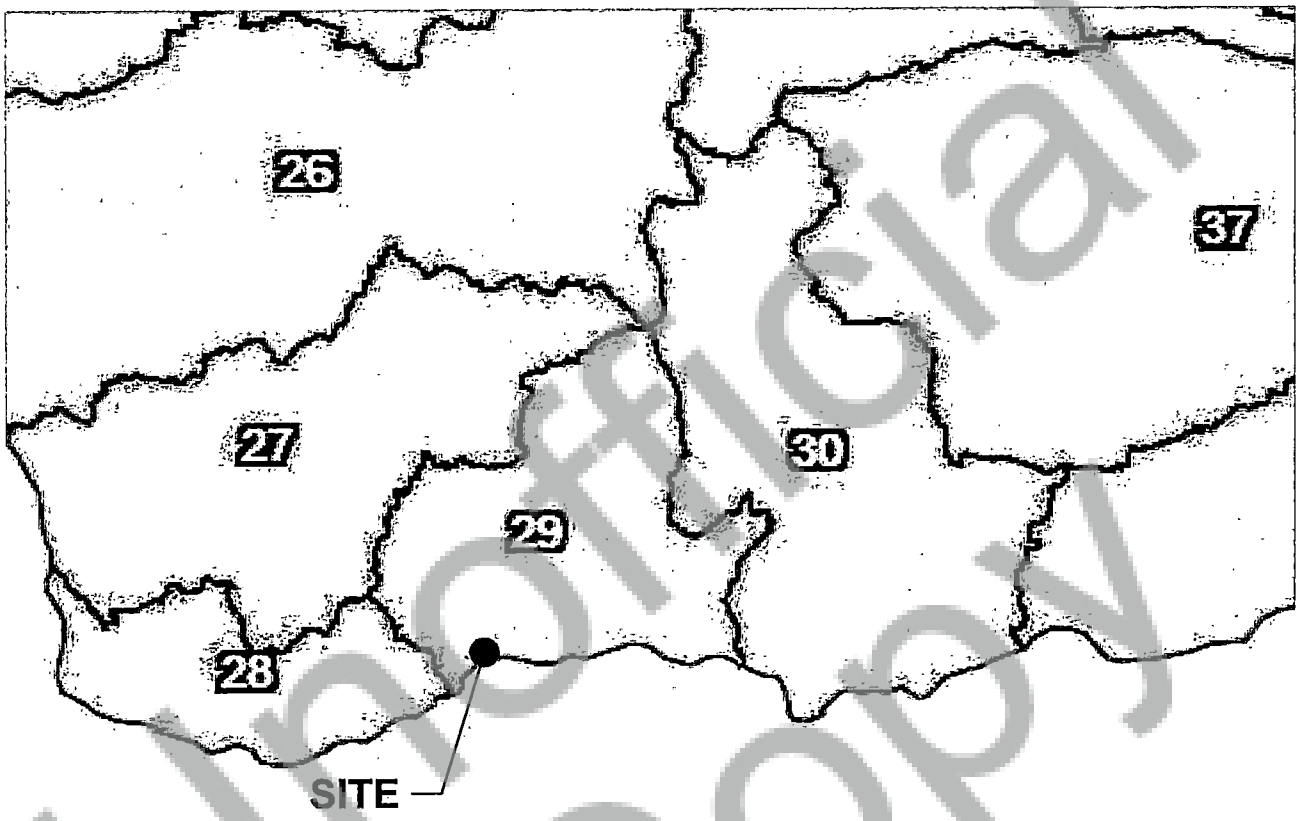

NOTE: Map provided online by Washington State Department of Ecology at web address: https://waecy.maps.arcgis.com/apps/webappviewer

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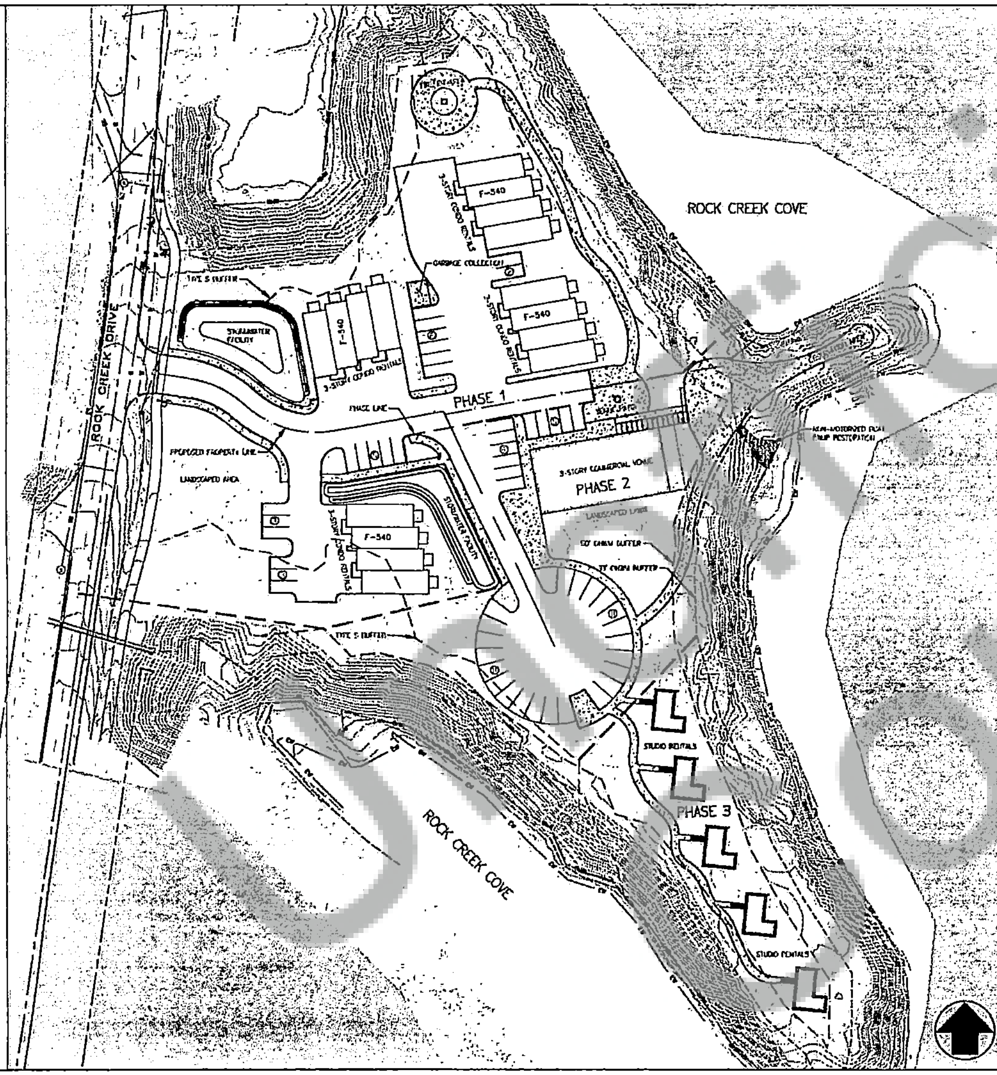
Figure 11
WRIA MAP
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.



PROJECT SUMMARY

PHASE 1
16 3-BEDROOM CONDO UNITS OPERATED AS HOTEL
TOTAL 48 BEDROOMS
TOTAL 32,950 SF
PEDESTRIAN ACCESS TO NORTHERN PENINSULA
COVERED FIRE PIT
LANDSCAPE IMPROVEMENTS
STORMWATER FACILITIES CONSTRUCTION
MASS GRADING
TYPE S BUFFER OFF-SITE MITIGATION
BOUNDARY LINE ADJUSTMENT

PHASE 2
15,000 SQ FT COMMERCIAL VENUE SPACE
LANDSCAPE IMPROVEMENTS
OBSERVATION AREA AND BOAT RAMP RESTORATION AND SAFETY IMPROVEMENTS

PHASE 3
5 STUDIO RENTALS
LANDSCAPE IMPROVEMENTS

FDM DEVELOPMENT INC.

ROCK CREEK COVE HOSPITALITY
MASTER PLAN
FDM DEVELOPMENT, INC.
STEVENSON, WA

DESIGNED: Z. PYLE
SCALE

SHEET TITLE
SITE PLAN

SHEET
C2.0

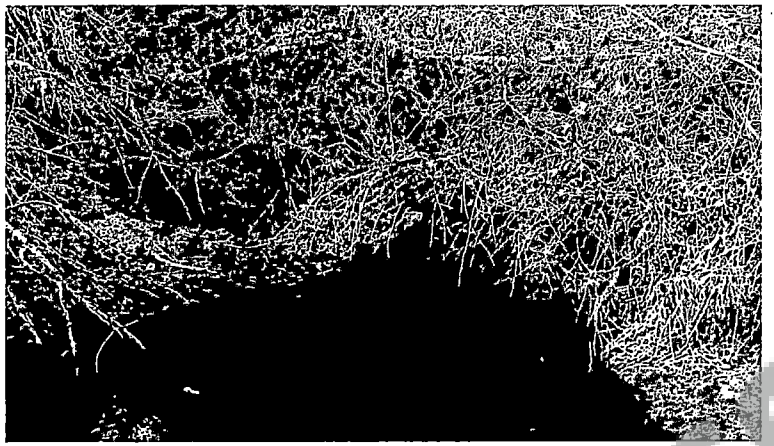


Photo 1. Inflow point of the unnamed tributary via concrete culvert.

Photo 2. Unnamed tributary flowing toward Rock Cove.

Photo 3. Overview of unnamed tributary's confluence with Rock Cove.

Photo 4. Mud flat adjoining Rock Cove.

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DATE: 1/17/20
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PR#: 2682.02

Photoplate 1
Site Photos
Rock Cove Preliminary Critical Areas Assessment
FDM Development, Inc.
City of Stevenson, Washington

Photo 1. Vegetated shoreline on the north end of the study area.

Photo 2. Vegetated shoreline extending toward the unnamed tributary.

Photo 3. Riprap on the eastern shoreline, facing north.

Photo 4. Riprap on the eastern shoreline, facing south.

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Photoplate 2
Site Photos
Rock Cove Preliminary Critical Areas Assessment
FDM Development, Inc.
City of Stevenson, Washington

Photo 1. Graveled boat launch on the east side of the study area.

Photo 2. Vegetated shoreline on the west side, facing south.

Photo 3. Vegetated shoreline and mud flat in the southwest portion of the study area, facing south.

Photo 4. Groomed vegetation in the center of the study area.

Ecological Land Services

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Photoplate 3
Site Photos
Rock Cove Preliminary Critical Areas Assessment
FDM Development, Inc.
City of Stevenson, Washington

Photo 1. Existing concrete and gravel surfacing.

Photo 2. Existing concrete and gravel surfacing.

Photo 3. Groomed vegetation in the center of the study area.

Photo 4. Existing gravel road.

Ecological Land Services

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MGR: ARBA
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Photoplate 4
Site Photos
Rock Cove Preliminary Critical Areas Assessment
FDM Development, Inc.
City of Stevenson, Washington

Ecological Land Services

June 16, 2020

Zachary Pyle, PE
FDM Development, Inc.
zpyle@fdmdevelopment.com
(210) 849-5592

Re: Critical areas report and conceptual mitigation plan for the Rock Creek Cove Hospitality proposal

Zach,

Ecological Land Services (ELS) has prepared the following critical areas report and conceptual mitigation plan for FDM Development (the applicant) as a component of the proposed mixed-use hospitality development adjacent to Rock Creek Cove on parcels 02070100130300, 02070100130400, and 02070100130200 (study area) in the City of Stevenson, Skamania County, Washington. The study area is in the SW ¼ of the NW ¼ of Section 1, Township 2 N, and Range 7 East of the Willamette Meridian, coordinates 45.6890, -121.8992, and is accessed from SW Rock Cove Dr (Figure 1). The study area's zoning is "Commercial" (C1). This report provides a description of existing critical areas on the proposed development site, a summary of proposed impacts from development, and a conceptual compensatory mitigation plan for unavoidable impacts.

ELS and Washington State Dept of Ecology (Ecology) completed fieldwork on December 30, 2019 to assess critical areas and fish and wildlife habitat in the study area. Together we concluded wetlands were not present but that all areas surrounding the study area are subject to fluctuations in water level in the Columbia River. We physically demarcated the ordinary high water mark (OHWM) of the Columbia River using consecutively numbered fluorescent tape flagging. S&F Land Services, a professional surveyor, recorded the flag locations on the same day. The findings from December 30, 2019 are presented here in accordance with Stevenson Municipal Code (SMC), Title 18 "Environmental Protection", Chapters 18.08 "Shoreline Management" and 18.13 "Critical Areas and Natural Resource Lands", and Stevenson's 2018 Shoreline Master Programs (SMP).

Proposal description:
The applicant is proposing a mixed-use hospitality development adjacent to Rock Creek Cove on the former Hegewald Lumber Mill Site in Stevenson, WA. The project seeks to complement the existing tourism industry in Stevenson by offering condo- and studio-sized units available for nightly and weekly rental, totaling 48 available bedrooms. A 15,000 square-foot commercial venue space will anchor the development and provide wide views of Rock Creek Cove and the Columbia River Gorge. The conceptual space planning of the commercial building consists of 5,000 open venue space, supported by 10,000 square feet of service, food preparation, and guest lounging area. The development seeks to attract both local and regional visitors, with venue space available for weddings, company parties, family reunions, and corporate retreats.

The project is proposed in three phases of development: Phase 1 includes condo-style units, operated by a single ownership group. Phase 2 will add the commercial venue space and restore water-side portions of the property for enhanced, publicly-accessible observation and enjoyment. Phase 3 completes the development with the studio-sized units, operated under the same ownership group as the remainder of the property.

Site Description

The study area consists of three parcels that form a peninsula in Rock Cove.[1] An unnamed tributary enters Rock Cove north of the study area (Figure 3). An open connection between Rock Cove and the Columbia River is present near its confluence with Rock Creek, southeast of the study area. The study area is currently undeveloped (there are no buildings) but it retains improvements from prior industrial land uses from the timber industry. These improvements include concrete and gravel surfaces, gravel roads accessing various points within the study area, a graveled boat launch, and armored embankments that span the majority of shoreline. A line of derelict wooden pilings is located just offshore southeast.

Methods

Stream Assessment:

ELS uses guidance provided by Ecology[2] and the U.S. Environmental Protection Agency[3] (EPA) to inform decisions about the location of an ordinary high water mark (OHWM) and to make determinations about stream characteristics, including habitat functions and flow dynamics. The Shoreline Management Act (SMA) of Washington State defines OHWM as a mark "...found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland..." (RCW 90.58.030(2)). ELS and Ecology used principles in this guidance and site-specific indicators to identify the OWHM of the Columbia River within the study area boundary. Site specific indicators included transitions in vegetation, wrack lines, scouring under trees and exposed roots, and breaks in topography.

Wetland Assessment:

ELS follows the Routine Determination Method developed by the U.S. Army Corps of Engineers (Corps) for wetland delineation.[4] The Routine Determination Method examines vegetation, soils, and hydrology to determine if wetland is present. EPA defines wetlands as "...areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

---

[1] Rock Cove is a man-made side channel of the Columbia River formed by the berm for Lewis and Clark Hwy (WA 14) and an adjacent railroad.

[2] Publication No. 16-06-029: "Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State", revised October 2016.

[3] Publication No. 910-K-14-001: "Streamflow Duration Assessment Method for the Pacific Northwest", November 2015.

[4] "Corps of Engineers Wetlands Delineation Manual", Wetlands Research Program Technical Report Y-87-1 (Environmental Laboratory 1987) and the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region (Version 2.0)" (U.S. Army Corps of Engineers, May 2010)

Soil Assessment:
ELS uses the Natural Resource Conservation Service (NRCS) map unit descriptions to gather baseline soil data. NRCS identifies soils in the study area as Arents 0 to 5 percent slopes. Arents is described by NRCS as a well-drained, terraced soil with more than 80 inches depth to the groundwater table. A typical profile includes gravelly sandy loam from 0 to 24 inches and extremely gravelly sandy loam between 24 and 60 inches. Arents do not have diagnostic horizons because they have been deeply mixed by plowing, spading, or other methods of moving by humans (NRCS 2020).

Critical areas findings
ELS and Ecology identified one unnamed tributary to the Columbia River north of the study area (Figures 2 and 3). The tributary is identified as a Type F (fish-bearing) water by Washington Department of Natural Resources (DNR) (Figure 4). Rock Cove, a side channel of the Columbia River, surrounds the study area on three sides. The Columbia River is designated Type S and is a shoreline of statewide significance. One Oregon white oak (*Quercus garryana*) is rooted above the OHWM at the northeast end of the study area. It is considered a Priority Habitat by Washington State Dept of Fish and Wildlife (DFW) and is recommended for protection. SMC provides guidance for Oregon white oak protection in Table 18.13.095-2 *Mitigation for Vegetation Removal within Riparian Habitat Areas*. No other priority habitats or critical areas[5] were identified in the study area.

According to SMC 18.13.095(D), the area designated as a fish and wildlife habitat conservation area (FWHCA) for Type F waters is 100 feet and Type S waters is 150 feet.[6] FWHCAs in the study area are partially to significantly degraded, as buffer degradation is defined in SMC 18.13.010(B)(15); meaning, areas of the FWHCA are dominated by more than 30 percent aerial coverage of invasive vegetation (primarily Himalayan blackberry (*Rubus armeniacus*)) and/or by fill, gravel, debris, asphalt, and other non-native material. Existing vegetation consists of deciduous and evergreen trees spaced along the north, east, and southwest shoreline with woody shrubs and herbaceous species established in some locations, particularly in the northwest and southeast portions of shoreline near SW Rock Creek Dr. (Figure 2). Elsewhere, shrubs and herbaceous vegetation are sparse or absent due to existing impervious surfaces, armored embankments, and other disturbances from industrial activities.

FWCA regulation
In most places the transition from top-of-bank to the OHWM is relatively steep. Erosion control in the steeper portions of the shoreline has been historically achieved with riprap-like armoring. Approximately 65 percent of the shoreline is armored with material that consists of loose stones, gravel, fragments of concrete, and large pieces of metal (i.e. rebar, logging cable, and non-specific steel remnants). Derelict in-water pilings are located along the southeast shoreline of the study area and formerly supported timber industry infrastructure.

SMC 18.13.095(D)(3) identifies functionally isolated buffer as lawns, pre-existing roads and structures, vertical separation, and other areas that do not protect the FWHCA from adverse impacts. Shoreline

[5] "Critical areas" are aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and wetlands as defined in RCW 36.70.A and designated by SMC 18.13.
[6] Table 18.13.095-1 - Fish & Wildlife Habitat Conservation Area Protective Buffer Widths

armoring meets the description of a preexisting structure that that does afford protection from adverse impacts. It lacks pervious surfacing for detaining and/or filtering sediment loads in surface runoff, an established and diverse native vegetation community able to provide forage, screening, refuge, or denning opportunities for wildlife species, and over-water shading for near-shore aquatic wildlife in the Columbia River. Accordingly, those portions of the study area that contain armoring satisfy the buffer exemption criteria per SMC 18.13.095(B)(3) (Figure 2).

Additional SMP requirements

The standard shoreline management area (or shoreline setback) for all designated shorelines in Washington State is 200 feet, measured landward from the OHWM. The study area is zoned "active waterfront"; according to the 2018 SMP, development setbacks in active waterfront is typically 50 feet.[7] Regarding the use of existing concrete, asphalt, and gravel surfaces for new development, a shoreline use lawfully constructed but does not conform to the current SMP standards is considered a nonconforming use. For the purposes of the December 2018 SMP, existing roads in the study area are considered nonconforming uses and do not need a Shoreline Conditional Use Permit to be retained or improved (SMP 2018).

Impacts and mitigation

The applicant's proposal follows the standard mitigation sequencing protocol of avoidance, minimization, and compensation for unavoidable impacts to critical areas. Critical areas associated with the proposal include the FWHCA for the unnamed tributary and the Columbia River, and one Oregon white oak tree. Phases 1 and 3 completely avoid FWHCA impacts and the oak tree will not be disturbed by development; however, Phase 2 of the development impacts approximately 0.12-acre of the Columbia River's FWHCA in an area where it is not functionally isolated by armoring (Figure 3). The proposed impact area is partially degraded by remnant debris that appears to consist of almost entirely of sawdust stockpiling.

Mitigation for buffer impacts is proposed as a combination of reduction and enhancement in accordance with SMC 18.13.095(D)(5). After reduction at the proposed impact site, all remaining buffer in the study area will be enhanced by removing non-native Himalayan blackberry (which currently has a dominant presence in shoreline vegetation) and installing native shrubs and herbaceous plants. A conservation covenant will be established for the entire enhancement area. Most buffer enhancement actions will take place in areas that are not functionally isolated by armoring to maximize functional and relevant habitat improvements. These portions of the FWHCAs total approximately 1.03 acres in the study area and achieve an enhancement ratio of approximately 8:1 for the impacts' mitigation (Figure 3). The applicant is also proposing to enhance portions of the 50-foot shoreline setback in the same manner (blackberry removal and native plant installation) to improve overall habitat function and ecological health in the study area. These proposed enhancement actions are anticipated to increase, diversify, and improve critical area functions above and beyond those provided by existing buffer conditions.

[7] Tables identifying setback distances per development type are attached to this letter for reference.

Accuracy and limitations
ELS bases this report's determinations on standard scientific methodology and best professional judgment. The information contained in this report should be considered preliminary and used at your own risk until it has been approved in writing by the City of Stevenson and any additional agency as determined necessary by the city. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report.

Thank you for the opportunity to provide this information. If you have any questions, please contact me by phone (360) 578-1371 or email andrew@eco-land.com.

Sincerely,

Andrew R. Allison
Wetland Scientist

Attachments:
Figures
Photoplates
Engineered site plan

OLSON ENVIRONMENTAL LLC
ENVIRONMENTAL SERVICES • GIS • HABITAT RESTORATION

June 17, 2020

Mr. Ben Schumaker
Planning Director
City of Stevenson
Stevenson, WA 98648

RE: Rock Creek Cove Hospitality Site – Critical Areas Review

Mr. Shumaker:

Olson Environmental (OE) has reviewed the Critical Areas Report dated June 16, 2020 to determine compliance with the City of Stevenson Municipal Code 18.13 which addresses Critical Areas and Natural Resource Lands. The report was prepared by Ecological Land Services (ELS) for the Applicant which is FDM Development. The Applicant is proposing a mixed-use hospitality development on the former Hegewald Lumber Mill site located between Rock Creek Drive and Rock Creek Cove. ELS identified riparian habitat associated with Rock Cove within the project area, therefore SMC 18.13.095 (Fish and Wildlife Habitat Conservation Areas – FWHCA) applies to this development. The Applicant is proposing minor encroachments into the riparian buffer which requires a Critical Areas Permit as outlined in SMC 18.13.035. In addition, an Oregon white oak tree was identified at the southeast end of the study area. This tree is not proposed to be removed for this project. The project area is also within a designated shoreline which is not part of this review. OE's findings are as follows:

Fish and Wildlife Habitat Conservation Areas Critical Areas Report

Critical Area report requirements are outlined in SMC 18.13.050 and specifically for FWHCA in SMC 18.13.095(C). ELS has identified a Type F stream in the north of the study area as shown in Figure 2 of their report. Rock Cove which surrounds three sides of the project area is a shoreline of the state (Type S) water. According to SMC Table 19.13.095-1, Type F streams have a 100 foot riparian buffer and Type S waters have a 150 foot riparian buffer. Riprap occurs along approximately 65 percent of the shoreline and maintained vegetation areas occur north and south of the existing entrance to the property (Fig. 2). The Applicant has presented the case that the riprap and maintained vegetation areas functionally isolate the 150 foot Type S riparian buffer (Fig. 2) based on SMC 18.13.095(D)(3) which identifies functionally isolated buffers as lawns, walkways, driveways, other mowed or paved areas, and areas which are functionally separated from a FWHCA and do not protect the FWHCA from

adverse impacts due to pre-existing roads, structures, or vertical separation, shall be excluded from buffers otherwise required by this chapter. If existing developments cause the width of the remaining buffer to be less than 50 percent of the base buffer, both conditions shall apply:
a. If the reduced buffer exists in degraded condition, the reduced buffer shall be enhanced in accordance with 18.13.095D.5, unless the area in question is utilized for activities consistent with water dependent uses
b. The buffer cannot be further reduced by averaging or on-site mitigation.

OE concurs that based on this definition the riprap functionally isolates the 150 foot buffer as shown if Figure 2. The maintained vegetation areas may functionally isolate however more detail needs to be provided to make that justification.

The remaining buffer in the riprap areas is less than 50 percent (75') of the base buffer (150'). If the maintained vegetation areas are considered functionally isolated the remaining buffer area north of the existing entrance and a portion of the buffer in the south-central portion of the project area are less than 50 percent (see attached graphic).

Based on ELS' description of the buffer at least portions of the remaining buffer are degraded. Therefore, SMC 18.13.095(D)(3)(a & b) apply. The degraded buffer in those areas where less than 50 percent of the base buffer remains shall be enhanced and the buffer cannot be further reduced by on-site mitigation.

OE recommends that the Applicant provide a more detailed habitat assessment report that includes the requirements of SMC 18.13.050, SMC 18.13.095(B)(1) and 18.13.095(C)(1) prior to final approval.

Conceptual Mitigation Plan

The Applicant has provided a conceptual mitigation plan that outlines the enhancement of the remaining riparian buffer and onsite mitigation for further reducing the buffer for the development. Very little detail is provided in the conceptual plan. Based on the information provided above only the buffer areas that have not been reduced by 50 percent by functional isolation can be further reduced through onsite mitigation. As per SMC 18.13.095(D)(5) onsite mitigation can be used to reduce the base buffer to 70 percent of the base buffer. For this project that would reduce the 150 foot base buffer to 105 feet. To reduce the buffer further requires off-site mitigation. As per SMC 18.13.095(D)(6), the riparian buffer can be reduced to 33 percent of the base buffer width through off-site mitigation. This would reduce the base buffer from 150 feet to 49.5 feet. It is OE's opinion that this project can meet the buffer reduction criteria by utilizing the off-site mitigation option which would allow the development

to occur outside of the 50 foot setback as required under the City's SMP. The Applicant shall provide a detailed mitigation plan that includes the requirements of SMC 18.13.095(D)(6) and 18.13.095(F). The Applicant has previously been provided a list of off-site mitigation options that would meet the requirements of SMC 18.13.095(D)(6).

Should you have questions or need more information, please contact me.

Regards,

Kevin L. Grosz

Kevin L. Grosz, S.P.W.S.
Project Manager
Wetland/Wildlife Biologist

222 E Evergreen Blvd Vancouver, WA 98660 ~ Phone 360.695.1385 ~ Fax 360.695.8117
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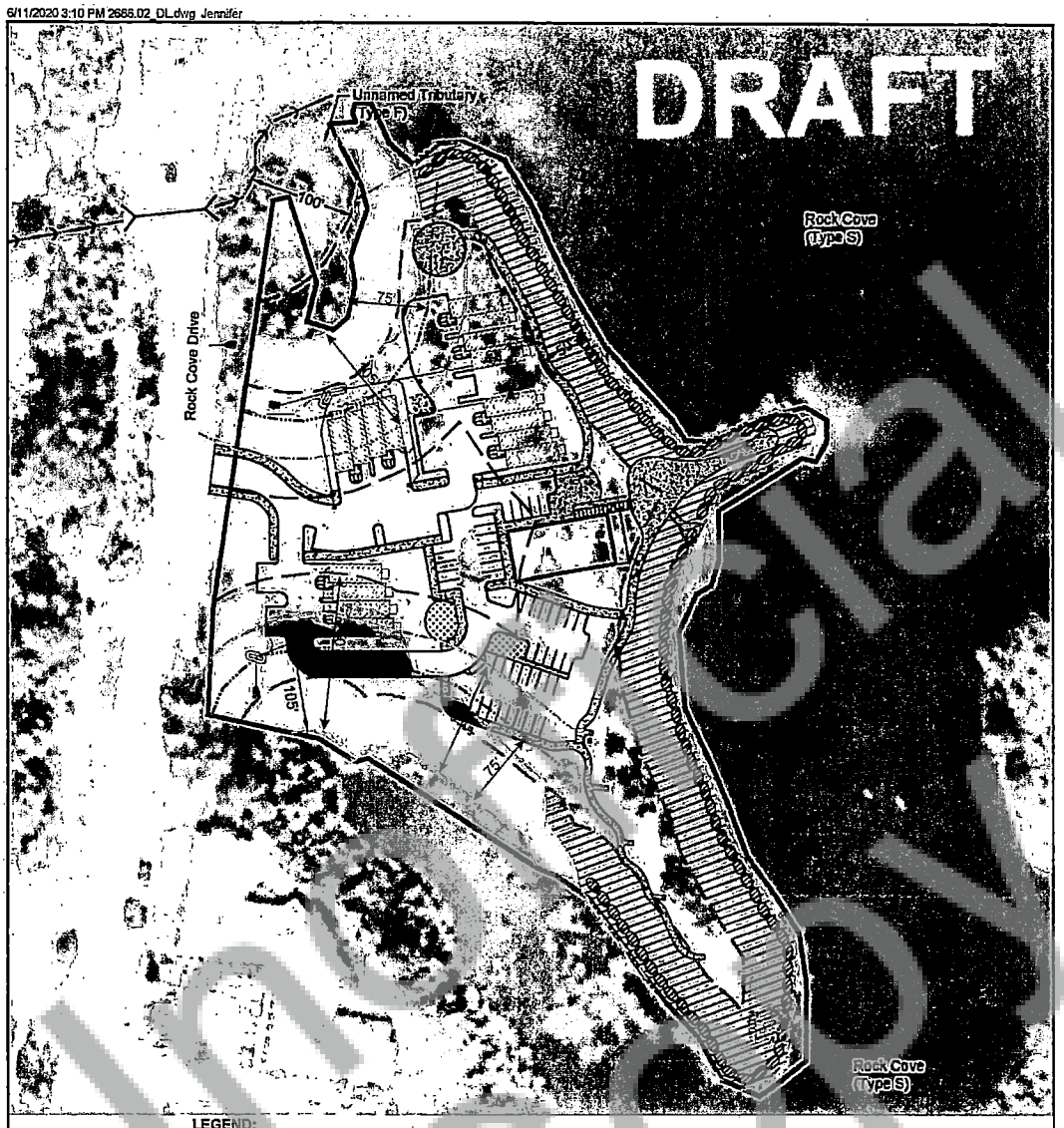

LEGEND:

- Site Boundary
- OHWM
- Stream with Flow Direction
- FWHCA Buffer for Type F
- Functionally Isolated FWHCA Buffer for Type S
- Reduced FWHCA Buffer For Type S (105')
- Shoreline Management Plan Setback
- Culvert
- Oak Tree Location
- Proposed Graveled Surfacing
- Proposed Storm Line
- Proposed Storm Outfall
- Proposed Impacts (0.12 ac.)
- Buffer Enhancement Area (1.03 ac.) (1:8.6 Impact to Enhancement Area Ratio)
- Associated Habitat Improvement (1.43 ac.)

NOTE(S):

1. Aerial from Google Earth™.
2. OHWM line was determined through a joint effort by Ecological Land Services and Washington Department of Ecology on December 30, 2019. OHWM flags were professionally surveyed by S&F Land Services December 30-31, 2019..
3. Site Plan provided by FDM Development, Inc.

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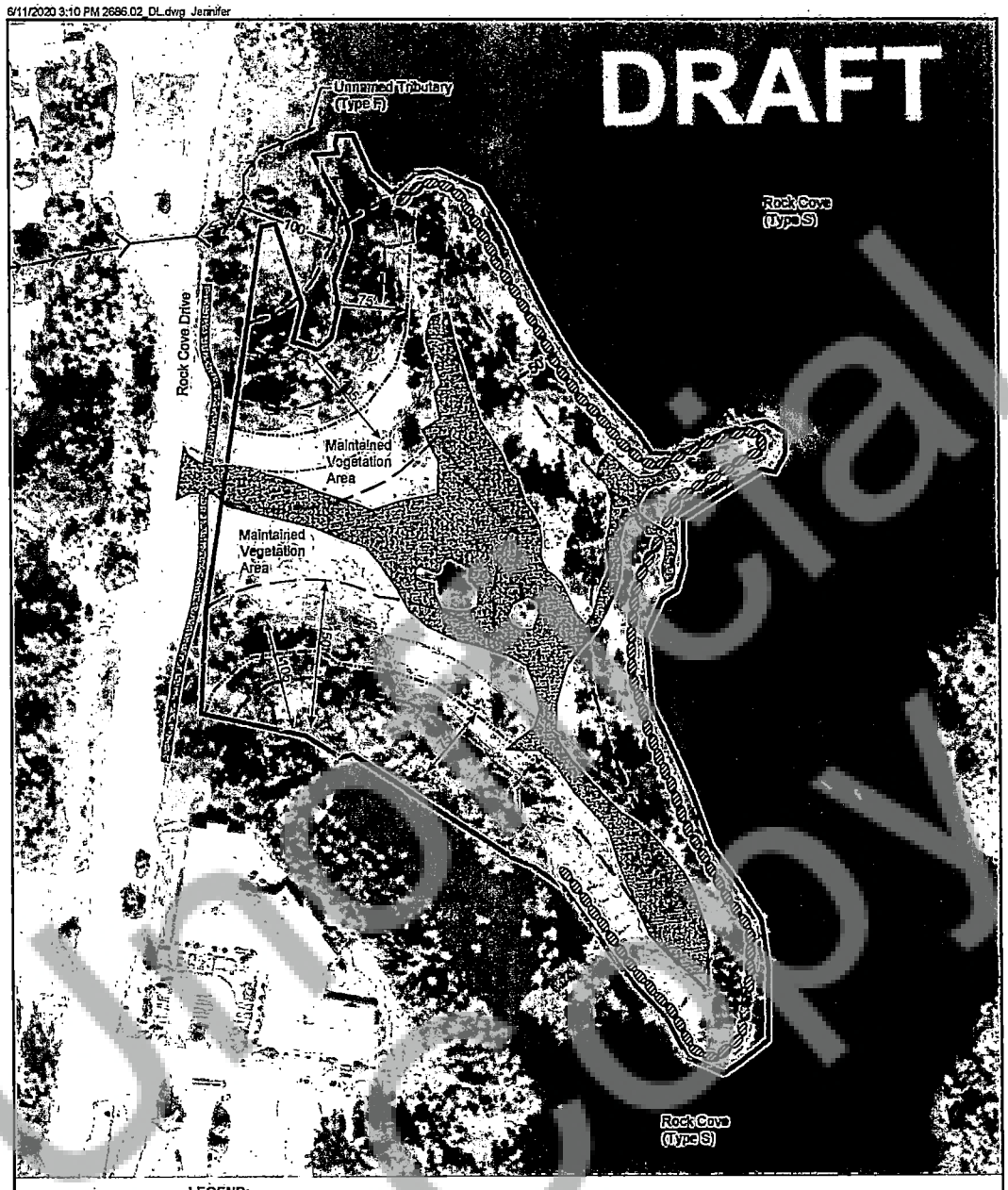
Figure 3
PROPOSED CONDITIONS MAP
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

6/11/2020 3:10 PM 2686.02_DL.dwg Jennifer



LEGEND:

- Site Boundary
- OHWM
- Stream with Flow Direction
- FWHCA Buffer for Type F
- Functionally Isolated FWHCA Buffer for Type S
- Shoreline Management Plan Setback
- Culvert
- Oak Tree Location
- Existing Graveled or Concrete Surfacing
- Existing Rip Rap

NOTE(S):

1. Aerial from Google Earth™.
2. OHWM line was determined through a joint effort by Ecological Land Services and Washington Department of Ecology on December 30, 2019. OHWM flags were professionally surveyed by S&F Land Services December 30-31, 2019.

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Figure 2
EXISTING CONDITIONS SITE MAP
Rock Cove CAR
FDM Development
City of Stevenson, Skamania County, Washington
Section 1, Township 2N, Range 7E, W.M.

8/2015

PACIFIC NORTHWEST GOOSE MANAGEMENT

A JOINT PROGRAM OF THE

OREGON DEPARTMENT OF FISH AND WILDLIFE

AND THE

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

Washington Department of FISH and WILDLIFE

OREGON Fish & Wildlife

Welcome!

The Oregon and Washington Fish and Wildlife Commissions have approved permitting requirements for northwest Oregon and southwest Washington goose hunters, which include passing an examination. This booklet is designed to assist you in successfully passing by providing information about goose management issues in the region and ways to identify geese while hunting. Follow these steps:

1. Review all the materials in this booklet carefully by yourself and with friends and family. View the video - *Pacific Northwest Goose Management* - which will supplement booklet information. The video is available to view on the ODFW and WDFW websites or for purchase from Videoland Productions.

2. Once you understand these materials, you will be ready to take the examination. Once you pass (you have up to three attempts), a goose hunting permit will be issued to you.

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WHY IS THIS TRAINING REQUIRED?

Goose management in northwest Oregon and southwest Washington is one of the most challenging aspects of our state waterfowl programs. The management of mixed subspecies of Canada geese on wintering grounds can make decision processes very complex. For over 30 years, goose hunting opportunities in this region have been very restrictive with complicated, but necessary regulations, primarily formulated to protect the dusky Canada goose. While these rules may seem confusing and inconvenient for hunters, they have been implemented to insure hunters remain in an important management role. This is a priority for our agencies.

However, with increasing overall numbers of geese and the mandate to protect the limited population of dusky Canada geese, we must work together to assist landowners with controlling crop damage from geese. If the hunting community can prove its ability to show restraint, take the time to learn goose identification in the field, and follow all regulations, we can assist in controlling goose populations. This is definitely a win-win situation. To take these issues lightly will mean failure and the reduction or loss of hunter participation in the future. You are an important partner in our management endeavors.

Use this home study course not only to improve your skills but to establish your role as a representative of the hunting community. You are in control of our future hunting opportunities and we want to help you be successful in every way. Good luck!

INTRODUCTION

Farmers, waterfowl hunters, and wildlife managers in northwest Oregon and southwest Washington are faced with problems for which there are no simple solutions. In short, several factors have combined to create almost unsolvable difficulties. Among them are:

1. Abundant numbers of Canada geese which depredate (damage) agricultural crops and pastures during winter and spring months.

2. Some of the seven subspecies of Canada geese that make up the wintering population require special protection and management efforts.

3. All Canada goose subspecies look generally alike. This creates difficulty for hunters who are asked to harvest some subspecies but not others, and an equally difficult problem for wildlife managers who must regulate hunting to ensure protection for subspecies that need special consideration.

This booklet is intended to give a basic understanding of the goose management issues in northwest Oregon and southwest Washington, some background on the geese that winter in the region and reference information to help identify all the relevant Canada goose subspecies. The video - *Pacific Northwest Goose Management* - is intended to supplement this information.

A subspecies of Canada goose is defined by scientific authorities as a distinct taxonomic entity based on many physical and geographical factors. For example, some goose subspecies vary greatly in size, such as the cackling and western Canada goose. This significant size difference is a result of gene pools diverging over thousands of years and influenced by numerous environmental conditions. Wildlife agencies in the Pacific Northwest have legislative mandates to preserve the natural diversity of wildlife present in the region.

If entering private lands, always ask permission first and adhere to all landowner requests. ***Don't abuse the privilege to hunt on private lands.***

History

In recent years, record numbers of geese have wintered in northwest Oregon and southwest Washington, to over 400,000. Prior to the 1970s, the winter goose population averaged fewer than 25,000 geese, and most of these were the dusky Canada goose subspecies. The dusky population, however, began declining about 1979, with an accelerated drop in the mid-1980s. That decline was attributed to lower production of goslings, combined with high harvest in wintering areas. Restrictive hunting seasons were implemented in the 1980s to reduce harvest of duskys, but likely increased survival rates for all geese. Hunting mortality of duskys has been greatly reduced due to current cooperative management efforts.

The reduced production of duskys in Alaska is largely the result of natural habitat changes brought about by the 1964 Alaska earthquake. The earthquake raised the level of the Copper River Delta, near Cordova, which is the core breeding area of the dusky Canada goose. This event eventually altered the quality and quantity of nesting habitat which resulted in increased predation on eggs and goslings. Prior to 1964, the low elevation of the delta and periodic flooding during both high and storm tides maintained broad expanses of sedge meadow bisected by drainage guts and sloughs. A mixed forb/low shrub community was found on slightly elevated slough banks. Brackish conditions significantly influenced productivity of waters and controlled composition of plant communities. Surveys in the 1950s showed geese strongly selecting these mixed forb/low shrub areas for nest sites. Flooding was then the major cause of nest losses. Nest predation by gulls was minor and mammalian predators were considered rare on the outer delta. Overall, nest success was usually favorable.

The 1964 earthquake uplifted the Copper River Delta by 2 to 6 feet, drastically altering the frequency of tidal inundation and promoting drying of slough banks and meadows. The drier conditions and lack of suppression by saltwater 'released' the growth of shrubs such as alder and willow that are now 10-20 feet tall and extensive over much of the delta. Reduced salinity is also thought to have altered the nutrient levels and aquatic productivity, possibly affecting food resources for adult geese and their broods.

Since that time, increased predation by bald eagles, brown bears, gulls, and coyotes has had a major impact on dusky production, although the intensity is variable from year to year. Thus, the productivity of dusky Canada geese is being affected by gradual long-term habitat changes, annual conditions such as weather, variable levels of predation, and the age structure of the population. Canada geese generally do not nest until their third year of life.

Many actions are underway to improve dusky production. Cooperative efforts between the Chugach National Forest, Ducks Unlimited, and fish and wildlife agencies have created over 500 artificial nest islands on the delta in the attempt to provide secure nest sites away from brushy corridors most heavily used by predators. Use of these structures is high, and so far nest success has been higher for birds using the structures than those using traditional nest sites. Ways to deal with predation have been explored thoroughly by the Alaska Department of Fish and Game, and some steps have been taken (liberalization of regulations affecting bear and coyote harvest and translocation of bears); however, truly effective measures to limit predator losses are either prohibitively expensive or socially unacceptable. Cutbacks in Alaska seasons have also occurred.

Middleton Island, located in the Gulf of Alaska about 60 miles offshore from the Copper River Delta, is the site of transplants of dusky Canada geese in an attempt to establish a new breeding population. Middleton is free of mammalian predators, and all goose hunting was closed there in 1996. Recent surveys indicate dusky Canada geese have been successful in nesting on the island, thus enhancing population numbers.

It's hoped new ways can be found to maintain good dusky production and survival. It is important that harvest be kept to a bare minimum to conserve this population.

The cackling Canada goose, a relatively new winter visitor to this region, also experienced a sharp decline throughout the Pacific Flyway. Numbers dropped from an estimated 400,000 in the late 1960s to fewer than 25,000 in the mid-1980s. The decline was believed to be largely due to sport and subsistence harvest, and the season for

this subspecies was closed during the mid-1980s. Cackling geese have now increased to the point of representing the most abundant subspecies in this region.

Subsistence harvest, the taking of animals by native peoples for food and survival, is an important cultural need in some regions of Canada and Alaska. The cackler is one Canada goose subspecies taken in substantial numbers by native hunters on the Yukon-Kuskokwim (Y-K) Delta of western Alaska. Cooperative agreements are important to protect shared wildlife populations. The Y-K Delta Goose Management Plan, signed by all coastal states, the U.S. Fish & Wildlife Service, and native Alaskans, calls for restrictions on both the breeding and wintering grounds to protect cackling, white-fronted, emperor, and black brant geese. Subsistence hunting does not occur on the Copper River Delta and does not affect dusky Canada geese. However, state and federal harvest management for all geese on the wintering grounds must be weighed against the needs of native peoples.

In the early 1990s, the cackler fall flight had increased to a point that the Pacific Flyway Council (an organization composed of the 11 western states) recommended reopening of the cackler season for both subsistence and sport hunters. Along with this buildup, there was a significant increase in the proportion of the birds wintering in this region with a proportional decrease in traditional wintering areas of California. Cacklers are now the most numerous subspecies wintering here.

Beginning in the 1970s, the Taverner's Canada goose population also increased in our region, along with resident western Canada goose. The Western Canada goose is the only subspecies that nests in both states.

A much smaller proportion of the wintering goose flock is made up of the lesser and Vancouver Canada goose subspecies. Small numbers of Aleutian Canada geese, winter along our coast and a few have been observed along the lower Columbia River and in the Willamette Valley.

To summarize, northwest Oregon and southwest Washington are now wintering more Canada geese than at any other time in recorded history. This winter population includes seven subspecies, which are closely related, and which look generally alike. Within this group are found moderate numbers of dusky Canada geese which need protection. Hunters may occasionally encounter snow and white-fronted geese also.

Large numbers of geese are contributing to increased crop and pasture depredation problems for many landowners. However, because of the relatively low population numbers of dusky Canada geese, controlling the overall goose population with sport hunting has been difficult to implement.

Dusky Canada Goose *(Branta canadensis occidentalis)*

The dusky is a medium-sized goose with a generally dark body coloration. Body feathers are typically a rich chocolate brown, but may also tend toward very dark gray. Weight ranges from 6 1/2 to 10 pounds. Culmen (bill) length ranges between 40 and 50 millimeters.

Duskys are fairly vocal geese and generally fly in small flocks, usually fewer than 40. However, they often intermix with other subspecies on the wintering grounds, so flock size is not a good indicator of subspecies. Duskys are relatively less wary than some of the other Canada goose subspecies and will readily use small fields, even fields ringed with brush. This behavior makes them vulnerable and is one reason they may be unduly affected by harvest when mixed with other, more wary subspecies.

Major Identification Points - dusky Canada goose

1. Generally brown cast to body feathers, although the degree of darkness is variable.

2. The dusky is larger than the cackler, Aleutian, Taverner's and lesser; and smaller than the Vancouver and western.

3. The dusky wing tends to be broader in relation to its length compared to smaller subspecies' that appear longer and narrower in relation to body size.

4. Red neck collars have only been placed on duskys. Collar observation programs assist in tracking birds over time and help determine annual survival rates.

5. If a bird seems unwary, comes right in, flies low, etc., be cautious, this is common behavior for a dusky.

6. Culmen length falls between 40 and 50 millimeters.

Taverner's Canada Goose *(Branta hutchinsii taverneri)*

The Taverner's Canada goose nests throughout a broad belt of tundra bordering the west and northwest coast of Alaska. Unlike the dusky, Taverner's are widely dispersed over a large geographical area so that it is difficult to monitor nest success or gosling survival. Because of its wide dispersion, this bird is not subject to significant subsistence harvest or concentrated predation.

Taverner's numbers have increased from a few thousand in the late 1960s. Changing agricultural practices, with a shift toward large, open fields and to crops such as rye grass and winter wheat, have favored this subspecies. It is also a wary bird and difficult for hunters to bag.

The Taverner's goose is a significant component of the geese which winter in northwest Oregon and southwest Washington. Taverner's Canada geese also occur in the Columbia Basin of Oregon and Washington. This goose in particular, due to its large numbers, has contributed notably to agricultural crop depredation problems.

This goose tends to fly in large flocks, sometimes exceeding several hundred. It is wary, often circling for a considerable time before landing. It prefers large, open fields and tends to avoid small fields or ones ringed with trees or brush. The Taverner's, like other subspecies, is rarely found in pure flocks and is often mixed with other

subspecies.

Where possible, hunters can focus efforts on Taverner's by hunting larger fields, using immense decoy spreads and shooting from pit blinds or by laying out under camouflage netting. Patience and extra work is needed in decoying these large flocks, but it can be very rewarding.

Major Identification Points* - *Taverner's Canada goose

1. Generally smaller than the dusky (there is usually a 20 to 30 percent weight difference). It is substantially smaller than the western or Vancouver subspecies. The Taverner's is about the same size as the lesser and is larger than the cackler.
2. Generally lighter in color than the cackler, dusky or Vancouver, but darker than the western. Color by itself is a factor to look for, but is not a sure identification characteristic since some Taverner's may be quite dark, and some duskys may be relatively light in color. This overlap makes identification by color alone unreliable.
3. Taverner's have a tendency to fly in large flocks and like to land in large, open fields. Birds are very skittish at times and movement from field to field is not uncommon. Flocks may circle an area numerous times before landing.
3. Wing shape is helpful for many hunters. The dusky wing tends to be broader in proportion to its length, while the Taverner's wing often appears narrower and longer in relation to body size.
4. Culmen length falls between 32 and 40 millimeters.

Lesser Canada Goose *(Branta canadensis parvipes)*

The lesser Canada goose closely resembles the Taverner's and is about the same size. The lesser is lighter in body color than the Taverner's, and much lighter than the dusky. The range of culmen length is similar to the Taverner's (32 to 40 millimeters), but some may run slightly larger and extend into the dusky range. The lighter breast color separates the lesser from the dusky.

This subspecies is common during winter months in eastern Oregon and Washington where it is often mixed with flocks of western Canada geese. In northwest Oregon and southwest Washington it is less abundant, but will be found mixed with other geese. In this region, lessers seem to occur more in the Willamette Valley. The lesser nests from interior and northern Alaska eastward into the Yukon Territory in a widely dispersed pattern. Subsistence harvest is not significant.

Major Identification Points - *lesser Canada goose*

1. Same size as Taverner's or slightly larger.
2. Light breast coloration similar to that of the western. Often has a more 'buffy' cast compared to the gray of the Taverner's.
3. Differentiated from the dusky by its lighter coloration.
4. Culmen length in same range as the Taverner's but may extend into the lower range of the dusky.
5. Behavior similar to the Taverner's.

Western Canada Goose *(Branta canadensis moffitti)*

Also known as the great basin or "honker", this is the largest and lightest colored of our Canada geese. It is also the

only goose that nests in Oregon and Washington and can be found throughout both states. Weights range between 8 and 11 pounds, sometimes larger. Culmen length is greater than 50 millimeters. Breast color ranges from a light gray in younger birds to almost white in adult birds.

The western Canada goose population has increased throughout Oregon and Washington. This subspecies nests as far north as southern Canada and in all our neighboring states. Our region's wintering population is made up of both resident and migrant birds.

***Major Identification Points** - western Canada goose*

1. Largest of our geese, many over 10 pounds in weight.
2. Breast color very light, almost white coloration in some cases.
3. Relatively slow wing beat.
4. Culmen length exceeds 50 millimeters.
5. Resident geese along the lower Columbia River and in the Willamette Valley have been marked with white neck collars.
6. Generally fly in smaller flocks, usually numbering less than 40.

Cackling Canada Goose *(Branta hutchinsii minima)*

This smallest Canada goose wintering in the Pacific Northwest is only about half again larger than a mallard. It has a short stubby culmen, short neck and a high-crowned 'puffy' head. The culmen measures under 32 millimeters. This bird's breast is generally dark in color, similar to the dusky, and may have a purplish cast. It has a high-pitched yelping call or 'cackle' from which it gets its name. The call is distinctive from other Canada geese found in our area. It is one of our least wary geese.

The cackler nests in a narrow fringe along the west coast of Alaska, mainly between the Yukon and Kuskokwim Rivers. Numbers of this subspecies dropped precipitously from about 400,000 in the late 1960s, to fewer than 25,000 in the mid-1980s. The decline is believed to be due to a combination of subsistence harvest in Alaska and sport harvest on the wintering grounds, mainly in California.

Because of the decline, the fall season was closed for this subspecies from 1984 through 1993. Subsistence harvest in Alaska was also been sharply reduced through cooperative ventures with native villages on the Y-K Delta. Results were very positive and numbers of cacklers increased to comprise the majority of geese wintering in this region.

Along with increased numbers, there was a pronounced distribution shift of wintering birds away from California into Oregon and Washington. Our historical wintering population numbered only a few hundred birds. In recent years almost all of the population has wintered in our region. This may be a result of changing habitat conditions in the Willamette Valley and along the lower Columbia River, drought conditions in California in the late 1980s, restricted hunting seasons, or a combination of other factors.

***Major Identification Points**- cackling Canada goose*

1. Smallest of our geese, about 1-1/2 times the size of a mallard.
2. Short neck, stubby culmen and "puffy" head.
3. Because of its small size, cacklers have a faster wing beat in comparison to larger geese. Generally flies in large flocks (>50).
4. Generally dark in color, but young birds are lighter in color.

5. High-pitched yelping or "cackling" call is distinctive.
6. Culmen length under 32 millimeters.
7. Yellow neck collars on some birds.

Vancouver Canada Goose *(Branta canadensis fulva)*

The Vancouver Canada goose is a large, dark-colored bird. In size it is similar to the western and in color it is dark like the dusky. Culmen length, like the western, exceeds 50 millimeters.

The Vancouver nests along the forested coastline of southeast Alaska and British Columbia. Its population appears to be stable. This goose winters mainly in British Columbia and Washington and many birds only migrate short distances. Few winter in Oregon, but Vancouvers may occasionally be encountered.

The Vancouver is difficult to distinguish from the dusky, having the same dark breast coloration. Because of our hunting season structure, few Vancouvers are taken. When taken, however, it can be distinguished by a culmen larger than that of the dusky.

***Major Identification Points** - Vancouver Canada goose*

1. Large size, dark breast color.
2. Culmen length exceeds 50 millimeters.
3. No neck collars or other marks have been used.

Aleutian Canada Goose *(Branta hutchinsii leucopareia)*

The Aleutian Canada goose nests on a few islands in the Aleutian Chain of Alaska and winters primarily in California. Small populations also winter and migrate along the Oregon and Washington coasts, but this subspecies is rarely encountered in the special goose hunt areas.

Due largely to the introduction of foxes onto its nesting islands, the Aleutian Canada goose population declined to about 800 birds by the early 1970s. The geese were federally listed as endangered in 1967.

Due to a very successful recovery effort, Aleutian Canada geese increased dramatically after they were removed from threatened status. This is a small goose, only slightly larger than the cackler, and has a grayish brown breast. Its most distinguishing feature is a broad, white neck ring, which completely encircles the lower neck. All Canada geese may have a neck ring. This may vary from a few white feathers, to a faint partial ring, to a complete ring. But seldom is the ring as consistent or distinctive as it is on the Aleutian. An occasional flock of Aleutian Canada geese has been seen within hunt areas of northwest Oregon and southwest Washington, but they are seldom seen far from coastal areas.

***Major Identification Points** - Aleutian Canada goose*

1. Small size, usually grayish breast color.
2. Conspicuous broad white neck ring, completely encircles the lower neck.

CANADA GOOSE IDENTIFICATION TIPS

- ✓ Be cautious about geese that drop right in, or geese that come in to small fields, or areas with trees or brushy areas nearby. Birds that come in low, with much calling, are probably duskys.
- ✓ Let birds get close. Be especially careful when it is raining, snowing, foggy, or the light is poor. All geese will look dark in poor light. Use binoculars as geese are approaching to help determine the subspecies before shooting.
- ✓ Look for geese with a distinct break between the black neck and breast feathers. Geese without this break are probably duskys. Some hunters find voice differences helpful, but others can hear no difference. This can only be learned by experience.
- ✓ Be aware of collared geese. Duskys are marked with red collars, cacklers with yellow collars, lessers with blue collars, and westerns with white/gray collars.
- ✓ Remember that all geese may have a white neck ring, ranging from a few white feathers to a complete ring. Therefore, you must consider all identification factors including behavior, voice, color, and size.

SPECIAL GOOSE SEASON

The goose hunting season for NW Oregon and SW Washington, under guidance of federal frameworks has several objectives:

1. Continue to allow as much hunting as possible under a season structure geared toward protection of Canada goose subspecies of concern.

2. Create an understanding among hunters of the problems we are having with geese, and help them to learn to differentiate among the several subspecies.

3. Use hunting as a tool to assist landowners in reducing agricultural depredation on crops and pastures.

Prior to restrictive hunting seasons, duskys made up a significant percentage of the goose harvest in the region. In recent years, duskys have been only a small percentage of the total geese harvested. This has only happened because hunters have made a conscientious effort and have cooperated with the provisions and intent of the season. With ongoing hunter and landowner cooperation, we hope to continue similar hunts until such time that more liberal hunting opportunities can be allowed. But good hunter compliance must be achieved to protect hunting. This study course is one tool in helping us achieve that goal.

Measurements of geese are taken to verify subspecies harvest. While not a precise science, there must be legal definitions to classify some subspecies based on culmen length and/or breast color. While you are not able to use these measurements before you pull the trigger, these measurements are directly related to the sizes and breast colors of geese. If you practice and use the information in this study course regarding all the identification characteristics for geese, you will be successful in avoiding mistakes.

Refer to the hunting regulations published annually by Oregon and Washington for specific rule changes. Please read the regulations carefully and bear in mind the following points:

1. **The dusky Canada goose season in NW Oregon and SW Washington permit zones is closed.** In addition to other penalties, if a dusky is taken the hunter cannot continue hunting the permit zone for the remainder of the season.

2. There is no way to identify with certainty all geese in the air. **When there is an identity question, the only safe and responsible action is to let them pass.** You will have other chances and the consequences aren't worth the risk.

3. Identifying the subtle differences among the various subspecies takes a lot of experience and practice. There is no substitute for looking at a lot of geese over a long period of time. With practice you will become more confident in your abilities.

4. Check opportunities for special September Canada goose seasons which target western Canada geese and require no special permits.

5. Police your own ranks. **Your help is needed to stop wildlife violations and ensure hunting opportunities in future years.** Always cooperate with law enforcement personnel. Also, assist new hunters in learning goose identification in the field.

6. The success of this season depends on hunter honesty and a commitment on the part of everyone involved to make it work. Continuation of this season depends on good hunter ethics and a conservation spirit.

THE WRITTEN EXAM

The following information will assist you in preparing for your written examination. **Please be sure to review the video - *Pacific Northwest Goose Management* - along with these printed materials.** Ordering information is provided on the inside front cover of this booklet.

Key Vocabulary Words You Should Know

culmen (p.6)	depredation (p.3)
Pacific Flyway (p.5)	predation (p.4)
subsistence (p.5)	production, productivity (p.4)
subspecies (p.3)	threatened (p.9)

Questions You Should Be Able To Answer

1. How many subspecies of Canada geese winter in our area? List all of them.
2. What characteristics are used to identify dusky Canada geese?
3. Has the overall winter Canada goose population in northwest Oregon and southwest Washington increased or decreased over the past 10 years?
4. What factors in Alaska have affected wintering Canada goose populations in Oregon and Washington?
5. What actions have fish and wildlife agencies taken to improve productivity of dusky Canada geese on the breeding grounds?
6. Which color neck collars have been placed on which subspecies of Canada goose?
7. Why is the dusky Canada goose more vulnerable to harvest than certain other subspecies of Canada goose?
8. Can you identify key characteristics, details, and important behavioral traits of all subspecies of Canada geese that winter in our region? Write down **at least** two key characteristics or traits for each subspecies.
9. Identify 3 key objectives for the special permit goose hunting season in Oregon and Washington. What type of hunter ethics must be practiced to protect future hunting?
10. List two key tips for distinguishing between dusky Canada geese and other subspecies.

Geese You Should Be Able To Identify (from photographs, black-and-white or color drawings, **or** characteristics)

Aleutian Canada Goose	Cackling Canada Goose
Dusky Canada Goose	Lesser Canada Goose
Taverner's Canada Goose	Vancouver Canada Goose
Western Canada Goose	Snow Goose
White-fronted Goose	

MORE ABOUT THIS STUDY COURSE

All material included in this course - whether in this booklet or on the video - is fair game for the exam. The most important thing you can do is **be prepared!** Questions are based on all course materials, and the testing procedure is designed to eliminate individuals who are not prepared to comply with tight restrictions and requirements for Canada goose hunting in northwest Oregon and southwest Washington. Don't rely on luck....study the material, review it frequently and discuss it with friends and family members. **Also, don't wait until the last minute to take an exam.** Exams must be scored before a permit is authorized for you to obtain at a license dealer, and this will take additional time. So, plan ahead!

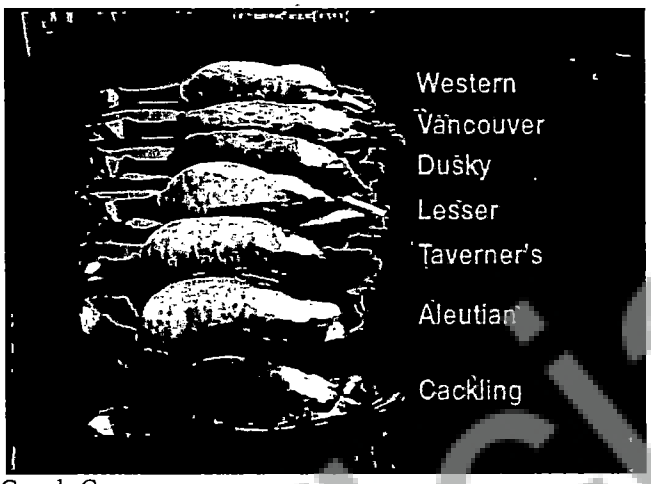
Please be sure to follow the recommendations contained in the ***Pacific Northwest Goose Management*** video when hunting. If you are ever in doubt about which subspecies of Canada goose is coming into your blind, **don't shoot!** The following pages contain drawings and photos of the various geese. Study them closely. Also spend time thoroughly reviewing the Oregon and Washington game bird regulations for important information concerning goose seasons in the region. Remember, regulations can and do change annually and states must adhere to federal frameworks for all migratory game bird seasons established by the U.S. Fish and Wildlife Service.

We all contribute to the continuation of hunting for ourselves and future generations. Thanks for your cooperation and have a safe and enjoyable hunting season this year. We wish you success!

More questions about this home study course or special permit goose seasons? Or do you need any special assistance?

In Oregon, call (503) 947-6300 or visit www.dfw.state.or.us

In Washington, call (360) 902-2515 or visit www.dfw.wa.gov

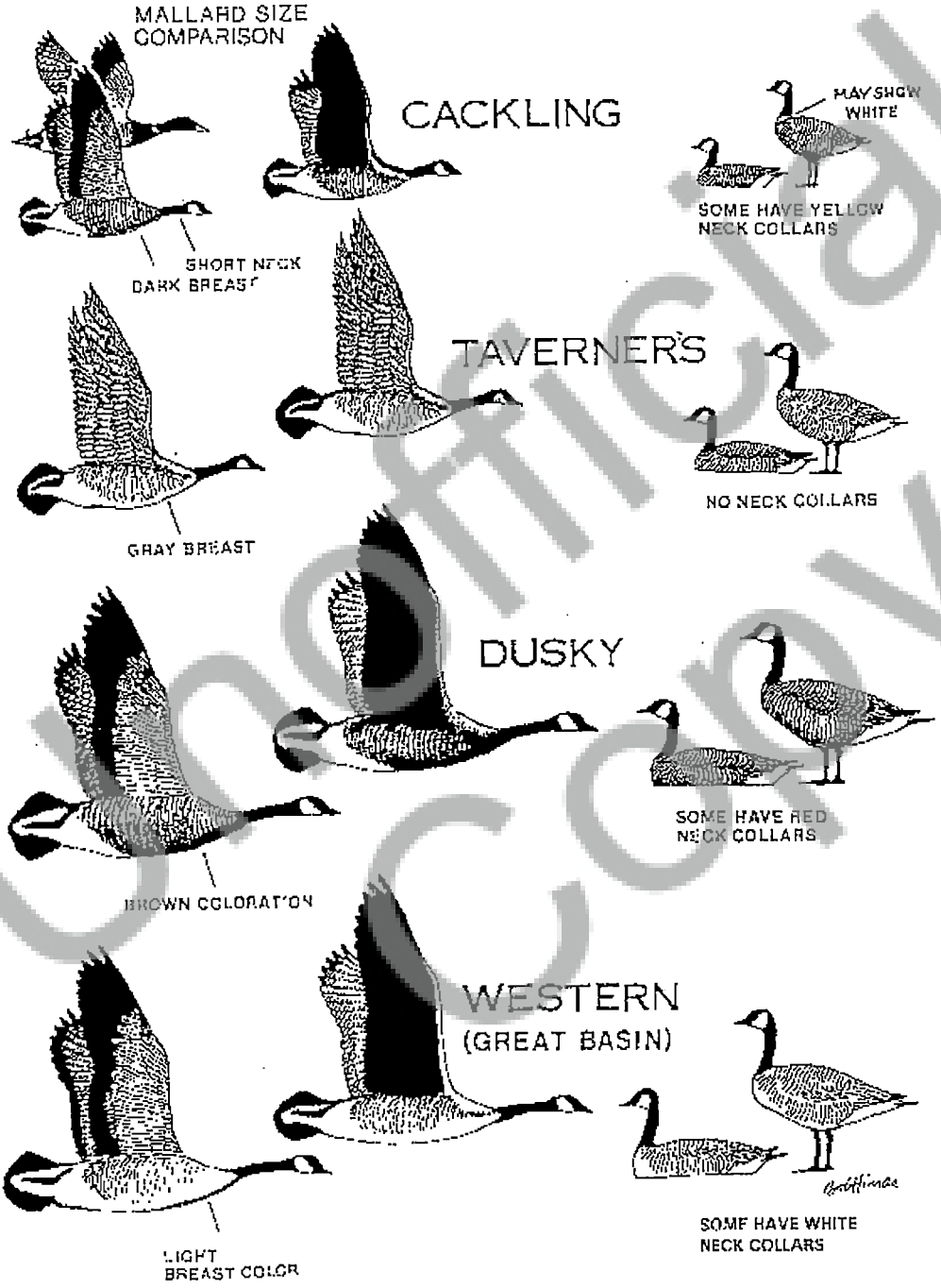


The seven subspecies of Canada Geese

Binoculars are an essential tool for accurate identification

Taverner's Canada geese on a cloudy day – note short neck, light breast

Dusky Canada geese on a clear day – note long neck, dark breast



Living with Wildlife

Canada Geese

Canada geese *(Branta canadensis)* are among the most familiar birds in Washington. They are a source of recreation for bird watchers and hunters and symbolize nature for many people. No one can miss the clear honking call of Canada geese when they fly overhead in their V-shaped formation.

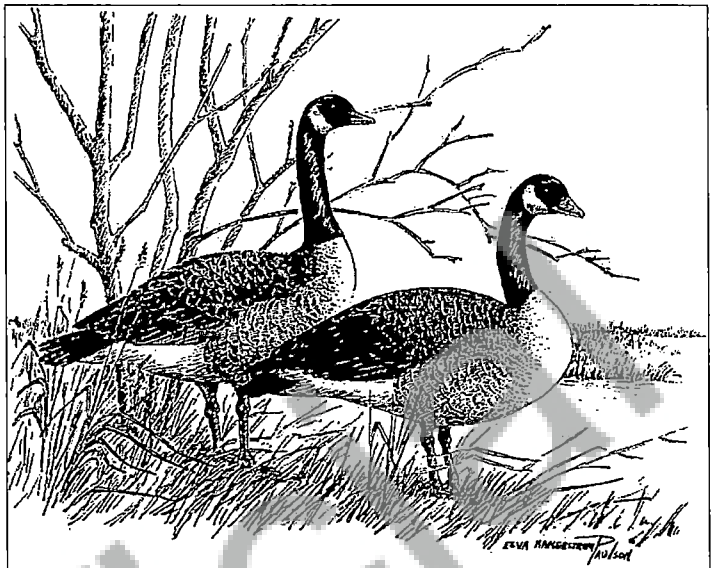


Figure 1. *The Western Canada goose has a black head and crown, a long black neck, and white cheek patches that connect under the chin. The adult gander (male) tends to be bigger than the goose (female) and averages 30 inches in length with a 60-inch wingspan.* *(Drawing by Elva Hamerstrom Paulson.)*

Two groups of Canada geese populate Washington—migrating geese and nonmigrating (often called resident) geese. For a goose to migrate, it must be taught the flight path by its parents. Therefore, all following generations of nonmigratory Canada geese will also be nonmigratory, or resident geese, which will stay year-round in the vicinity where they were born.

Populations of resident Canada geese have dramatically increased over the past 25 years, particularly in urban areas where there are few predators, prohibitions on hunting, and a dependable year-round supply of food and water.

Canada geese are particularly attracted to mowed lawns around homes, golf courses, parks, and similar areas next to open water. Because geese and people often occupy these spaces at the same time of the year, conflicts arise. Many citizens enjoy the presence of geese, but others do not.

Several subspecies of Canada geese breed or migrate through Washington. Their taxonomy has been confused by the introduction of mixed subspecies, and will likely remain unclear for a long time.

The Western Canada goose *(Branta canadensis moffitti,* Fig. 1) is the largest resident subspecies, referred to in the following as Canada geese, or geese.

Facts about Washington's Canada Geese

Food and Feeding Habits

- Canada geese graze while walking on land, and feed on submerged aquatic vegetation by reaching under the water with their long necks.
- Wild food plants include pondweed, bulrush, sedge, cattail, horsetail, clover, and grass; agricultural crops include alfalfa, corn, millet, rye, barley, oats, and wheat. Geese also eat some insects, snails, and tadpoles, probably incidentally.

Nests and Nest Sites

- Canada geese nest in areas that are surrounded by or close to water.
- Nest sites vary widely and include the shores of cattail and bulrush marshes, the bases of trees, the tops of muskrat lodges and haystacks, and unoccupied nests of eagles, herons, and ospreys. Nests have produced successful broods of geese and ospreys in the same year.
- Other nest sites include planter boxes and nesting structures provided specifically for geese.

- The nest is a bowl-shaped depression approximately 1½ feet in diameter lined with grass, leaves, and goose down.
- A pair of geese may return to the same nest site in consecutive years.

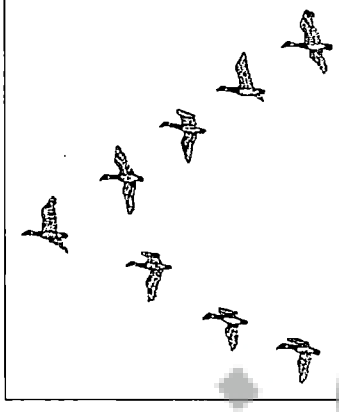


Figure 2. *The V-shaped flight formation allows each trailing bird to receive lift from the wingtip vortex of the bird in front of it, saving energy and greatly extending the range of a flock of birds over that of a bird flying alone.*
(Drawing by Jenifer Rees.)

Reproduction

- Canada geese usually begin nesting at three years of age.
- Adult pairs usually stay together for life unless one dies. Lone geese will find another mate, generally within the same breeding season.
- Between one and ten, but normally five to six eggs are laid in the nest in March, April, or May. Eggs are incubated by the goose (female) while the gander (male) stands guard nearby. The female leaves the nest only briefly each day to feed.
- Eggs hatch after 25 to 30 days of incubation. The young, called goslings, can walk, swim, and feed within 24 hours.
- Both parents (especially the gander) vigorously defend the goslings until they are able to fly, which is at about ten weeks. The young geese remain with their family group for about one year.
- If the nest or eggs are destroyed, geese often re-nest in or near the first nest. Canada geese can raise one clutch per year.

Longevity and Mortality

- Predators of Canada geese and their eggs include humans, coyotes, raccoons, skunks, bobcats, and foxes, as well as gulls, eagles, crows, ravens, and magpies.
- Canada geese hatched in urban environments may have very low first-year mortalities due to the abundance of food and relative scarcity of natural predators.
- Canada geese can live more than 20 years in captivity; in the wild they have a much shorter life span.

Viewing Canada Geese

Geese are among the few water birds that will tolerate the environmental conditions found in urban areas. They are often the largest and most conspicuous bird species that people see.

Geese are often seen in a V-shaped formation when flying (Fig. 2). Such a formation allows each trailing bird to receive lift from the wingtip vortex of the bird in front of it, saving energy and greatly extending the range of a flock of birds over that of a bird flying alone. Scientists have suggested that flying in V-formation may also be a way of maintaining visual contact and avoiding collisions.

Molting

Like most waterfowl, adult Canada geese go through a complete molt every year. Molting is an opportunity for geese to replace their worn, frayed, or lost feathers with new ones. The molt takes 30 to 45 days and is completed by mid-July, a time when the adult geese are free from activities such as nesting, brood rearing, and migrating.

The young are still with the adults during the molt, and at this stage none of the family can fly—the young because they haven't grown their full flight feathers and the adults because they are replacing their flight feathers. Thus, the birds often move to areas that provide adjacent water for escape opportunities.

By late summer all of the family can fly, and they move to areas where there is abundant food, joining with other geese to form large flocks.

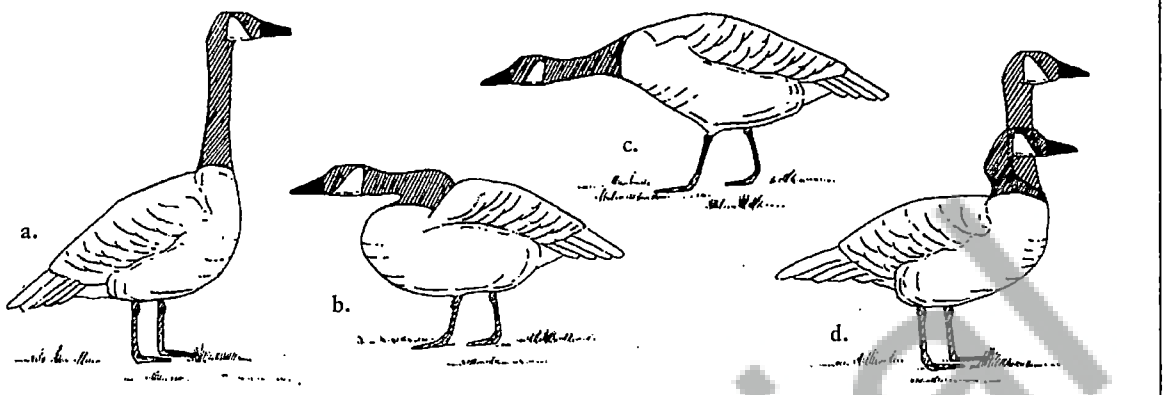


Figure 3. *Some common displays of Canada geese.* (From Stokes, *A Guide to Bird Behavior, Volume 1.*)

Displays

Visit nearly any body of water in a nearby park (especially during the breeding period) and you will likely observe several obvious visual displays within a large active flock (Fig. 3).

The **alert display (a)** is given when a goose is wary of some danger. The neck is vertical and straight and the head is horizontal.

The **bent-neck display (b)** is given in conflict situations with other geese. The neck is coiled back and the head is lowered and pointed toward the opponent. This display may be accompanied by a hiss.

The **head-forward display (c)** usually follows the bent-neck display and is an expression of increased threat. The goose extends its neck and holds the head low and points it toward the opponent. This display may be accompanied by a call.

The **head-pumping display (d)** is also given in conflict situations, and often precedes direct attack. The goose rapidly lowers and raises its head in a vertical pumping motion.

Nest Sites

Early in the breeding season, watch for a pair of geese quietly exploring an area. Later, listen for the honking call, which may be geese either greeting each other or engaging in a territorial squabble. Also, look for a lone male, feeding or resting, who is aggressive toward other geese or to you. Chances are its mate is on a nest nearby.

Because Canada geese are aggressive defenders of their nests and young, do not approach too closely; they may charge, and can inflict bruises with their beaks and wings.

Calls

The typical goose *ahonk, ahonk, ahonk* call is given during aggressive encounters, as a greeting, and when calling a mate. The call of the male is thought to be lower than that of the female, and when a pair flies overhead, you may be able to distinguish the two sounds.

A hiss-call is given when geese are defending their territories, their nests, or their young, and is usually given only at close distances.

Tracks

Canada goose tracks are often seen on mudflats in conjunction with their sausage-shaped droppings. Their feet turn inward when they're walking. The foot's three main toes fan out in front and are connected by webs (Fig. 4). The claws are broad and blunt, and their imprint can usually be seen.

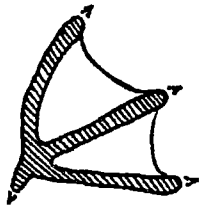


Figure 4. *The Canada goose has four toes, but the hind toe is elevated and does not leave an imprint.* *(Drawing by Kim A. Cabrera.)*

Droppings

Droppings are cylindrical and five to eight times longer than wide. Fresh droppings are greenish and coated with white nitrogenous deposits. Older droppings are darker.

Because geese have a rudimentary digestive system, they eat often and expel undigested remains in short order. Adult geese produce 1 to 3 pounds of droppings per day per bird.

Preventing Conflicts

Canada geese are extremely adaptable. They use food and other resources present in urban landscapes for nesting, raising young, molting, feeding, and resting. This has led to increasing conflicts between geese and people.

In parks and shorelines with short grass, large flocks of geese can denude areas of vegetation and litter them with their droppings and feathers. Public swimming areas used by many geese have been closed to swimming (see "Public Health Concerns"). When nesting, geese can be aggressive toward humans, and may "attack" people who come near their nests or young.

In public areas with favorable habitat, it is rarely desirable, or possible, to eliminate geese entirely. Ideally, management programs should strive to reduce goose numbers and related problems to a level that a community can tolerate.

No single, quick-fix solution is likely to solve conflicts with geese. An integrated approach using several of the techniques described below in combination is required. Any approach to controlling geese ideally should be in place before the conflict starts—or quickly thereafter—as it is much more difficult to discourage geese after they have become attached to a site. After nesting has started, moving or scaring geese off a nest is illegal.

To prevent conflicts or remedy existing problems:

Stop feeding geese: When the diets of geese are no longer supplemented with handouts and they have to depend on the natural food supply, some or all the geese will move elsewhere.

In public areas, it is helpful to first install interpretive signs explaining the problems caused by feeding geese. Such signs might include the following in their text, preferably in the appropriate languages:

- Please don't feed the geese!
- Human food is not good for the geese because it lacks proper nutritional value.
- Feeding attracts more geese than the area can support naturally.
- Geese in high concentrations are more likely to get diseases and parasites.
- Geese droppings harbor parasites that can cause human health problems.
- Goose droppings increase algae growth that, in turn, results in fish kills.
- Goose droppings are unsanitary, unsightly, and contain parasites irritating to humans.
- Geese eat plants needed for ground cover and erosion control.
- Too many geese in one area may force the municipality to have them killed.
- Goose-management costs taxpayers money.

In order to prevent well-intentioned people from feeding geese, some localities may need to pass ordinances to regulate feeding and create authority to enforce such regulations.

Lawn management: Evolutionarily, Canada geese are tundra nesters that prefer to congregate on low vegetation adjacent to open water. Thus, areas of lawn next to water often attract geese. Large lawns provide food to graze on, room to take off and land, and an unobstructed sight line to scan for potential predators.

Although it can be expensive to transform a large lawn into something else—such as a play area or a landscape made up of plantings other than grass—it is the best long-term solution to human/goose conflicts. Such a transformation can occur over time and in phases; fencing or repellents may be necessary while the new landscape is getting established.

One important modification to a large area of lawn is to reduce its size to the point where geese no longer feel safe grazing on it. An open sight line (the distance from the geese to a place where a predator could hide) of less than 30 feet will generally cause geese to move to a more comfortable grazing area.

Any size lawn can be made less attractive to geese by increasing its growth height to 6 inches and reducing the number of tender new shoots it produces. Stopping fertilizing and watering will reduce both the palatability of the lawn and the time it takes to maintain it. (The grass can be maintained at any height with a weed-whacker.) All of the lawn—or only a wide portion bordering a body of water—can be maintained this way.

Barriers

Barriers are most effective when geese numbers are low, when geese are molting (not flying), and when the barrier is in place before geese begin using the area.

Low barriers may not deter flying geese from entering an area. However, since geese typically do not land in an area that is less than 30 feet wide, barriers, or lines of vegetation, can be used to break a site into smaller spaces. Low barriers can be combined with above-ground grids to prevent flying geese from accessing planted areas.

Plant Barriers

Geese have a fear of confinement you can take advantage of by the way you landscape. Shrubs, aquatic plants, and closely spaced groups of trees can be used to discourage geese if they block the birds' pathways to grazing areas and safety, and reduce the birds' sight lines to 30 feet.

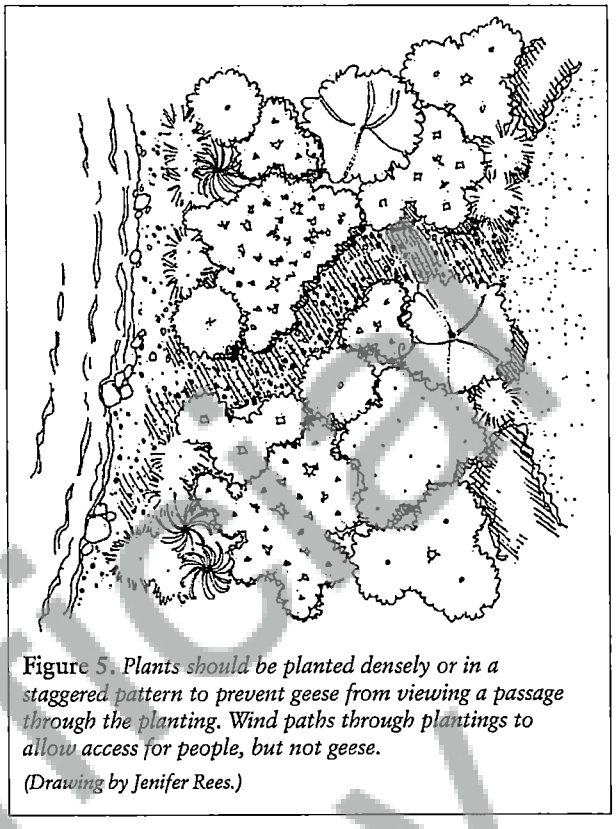


Figure 5. *Plants should be planted densely or in a staggered pattern to prevent geese from viewing a passage through the planting. Wind paths through plantings to allow access for people, but not geese.*
(Drawing by Jenifer Rees.)

For immediate results, plants should be at least 30 inches tall to prevent geese from seeing over them, and planted densely or in a staggered pattern to prevent geese from walking through gaps between the plants. Wide plantings (20 to 30 feet) are more effective than narrow plantings. In wide plantings, winding footpaths prevent the geese from having a direct line of sight through the planted area, yet still provide shoreline access for humans (Fig. 5).

Keep New Plantings in the Ground

Newly planted sites often suffer high plant mortality due to geese pulling small plants out of the ground. If still migrating, these geese would ordinarily arrive later and there would not be such pressure on the plants. To reduce this problem, or where barriers and other control tactics are not practical:

- Place large stones around the crowns of plants.
- Insert a metal staple (used to secure jute netting) over the crown of individual plants.
- Place long lengths of wood lath over the crowns of plants planted in a row. Secure the lath with metal staples or rocks.
- The above-mentioned devices will need to stay in place for two growing seasons—longer in areas where emergent plants are being established, or where there is a lot of pressure from resident geese.
- Another approach is to use large plant material (1-gallon containers instead of 4-inch pots or plugs). The larger root ball will have a better chance of getting established during the first few growing seasons.
- Drape bird netting over groups of new plantings; check netting daily for entangled birds.

Where space is limited, one or two rows of shrub plantings can be combined with a fence, as described below. Ideally, the fence should be installed first and the shrubs planted as closely as possible to it so that as the shrubs grow, they envelope the fence.

Geese often gain access to grazing areas by simply walking out onshore from the adjacent body of water on which they have landed. Therefore, introducing a barrier of aquatic plants along the shoreline of a water body can create both a physical and a visual barrier to geese. Barriers of native aquatic vegetation that are at least 3 feet wide and include tall material, such as bulrush *(Scirpus* spp.), are most effective (Fig. 5).

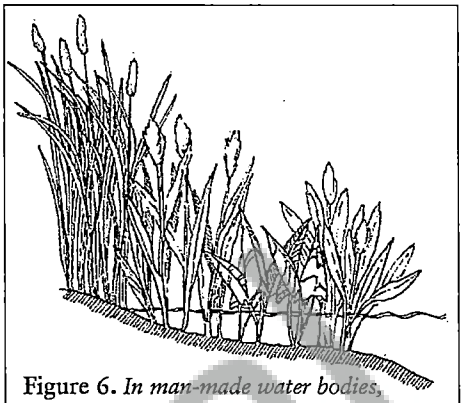


Figure 6. *In man-made water bodies, cutting and filling can provide a stable substrate on which to plant a barrier of aquatic plants. The water level of the pond, or other impoundment, can be temporarily lowered to allow construction of the planting area.*
(Drawings by Jenifer Rees.)

If the limiting factor is the absence of an area on which to establish the new aquatic planting, constructing such an area can help. In man-made water bodies, cutting and filling can achieve a stable substrate on which to plant a barrier of aquatic plants. The water level of the pond, or other impoundment, can be temporality lowered to allow construction of the planting area. However, along natural water bodies, construction of a planting area can be more problematic—water levels may not easily manipulated, placing fill in deeper water is more likely to create unstable, slump-prone areas, and a permit may be required (contact you local wildlife office for permit information).

Fences

Fences can be made from woven wire, poultry netting, plastic netting, plastic snow fencing, monofilament line, or electrified wire. Fences should be at least 24 inches tall (3 feet may be better), firmly constructed, and installed to prevent the geese from walking around the ends.

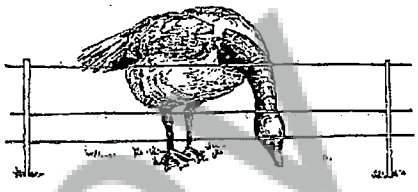


Figure 7. *A low electric fence may be a temporary solution when geese have young or are molting. Flag the lines to warn people, and expect pets and wildlife to knock them away.*
(Drawing by Jenifer Rees.)

Regardless of the material, lower openings should be no larger than 4 inches to prevent goslings from walking under or through the fence. Thus, a fence made from five monofilament lines (at least 20-pound test) should have lines set at 4, 8, 12, 18, and 24 inches above ground.

Fences used in areas with tidal influence need to prevent geese entering the shore at all tide levels while not trapping fish. Turning field fencing upside down—moving the wider holes to the bottom—may accommodate fish passage.

Many electric fences are portable and can be set up in one or two hours and quickly taken down for storage when not in use (Fig. 7). The strands only need to be placed 4, 8, and 12 inches above the ground.

Due to the variables affecting your selection of a power source, and fence design and operation, it is best to consult a reputable dealer for the specifics regarding its use (look under "Fence Contractors" in your phone directory). Information is also available from farm supply centers. Most home improvement centers carry suitable units. Consult your local zoning office and neighborhood covenants to determine if electric fences are permitted where you live.

Grids and Netted Rooms

A grid or network of multiple parallel lines of wire, stainless-steel cable, twine, rope, or monofilament (50 pound test) stretched 1 to 2 feet above a water body or other area will create a flight hazard and deter geese. There should be no more than 5 feet of space between lines. If humans need to access the area under the grid, the grid can be installed high enough to accommodate them. To prevent geese from walking under the grid, install a perimeter fence as described earlier.

Attach separate lines to each vertical support (do not run the same length of wire through the entire grid) so that you will not have to rebuild the entire grid should one line break. Wherever two grid wires cross, tie the lines together to prevent rubbing and possible line breakage.

In places with large numbers of geese, and where funding is available, newly planted areas can be entirely enclosed in netting for the first few growing seasons. A netted room built high enough to allow access for maintenance can be constructed using wooden vertical supports sunk in the ground, horizontal steel cable supports, and heavy-duty bird netting. Such netting is commercially available from companies that specialize in bird control. Previously used bird netting may be available from habitat restoration companies, as well as used gill netting from fisherman and fish hatcheries. The cost of new netting makes seeking out an alternative worthwhile.

Where long runs of steel cable are being installed to support netting, each line should get a separate length of cable, fitted at one end with an eyebolt, and at the other end with a turnbuckle. This will allow the cable tension to be adjusted or the cable to be removed if needed. The netting can be attached to the cable with nylon string, wire, or hog rings. Hog rings and a special tool to attach the rings are recommended for large projects.

Note: All grids, netting, and fencing material should be regularly monitored for holes, trapped wildlife, sagging, and overall effectiveness.

Harassment and Scare Tactics

Harassment and scare tactics are used to frighten Canada geese away from feeding, loafing, and resting areas where they are unwanted. Because geese learn that real physical danger isn't associated with harassment and scare devices, the birds will quickly learn to ignore them, no matter how effective these devices may be initially. Because of this, and to take advantage of geese being neophobic (fearful of novel objects), two important rules are: (1) never rely solely on one tactic, and (2) vary the use by altering the timing and location. Harassment and frightening devices are only as effective as the person deploying them.

Harassment and scare devices are available from the Internet, at over-the-counter bird-control businesses, and at some farm and garden centers.

Harassment and scare tactics include:

Eyespot Balloons

Like most birds, geese rely more on vision than on their other senses to avoid danger, and so visual stimuli can be effective. Commercially available eyespot balloons are large, helium-filled balloons with a large, eye-like images. (Large colored spots on three sides of any helium balloon can suggest eyes.) Tether balloons on a 20- to 40-foot monofilament line attached to a stake or heavy object. The balloons should be located where the wind will not tangle them in trees and utility lines, and should be repositioned at least once per day. Two balloons should be adequate for an average size yard.

Flags and Streamers

Flags and streamers work best in areas where there is a steady wind. A simple flag design uses plastic garbage bags mounted on tall poles (Fig. 8).

In addition, mylar tape can be made into 6-foot streamers and attached to the top of 8 foot long poles. Mylar tape is silver on one side, usually red on the other, and is very shiny and reflective.

A disadvantage of Mylar tape is that it is only effective in bright sunlight and wind. Poles with flags and streamers should be repositioned once per day.

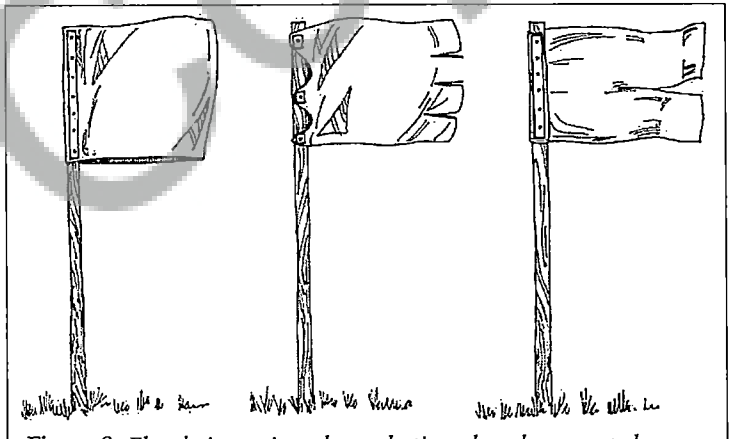


Figure 8. *Flag designs using a large plastic garbage bag on a pole. Note the wooden battens installed to prevent the flags from ripping.*

(Drawings by Jenifer Rees.)

Scarecrows

Scarecrows are only effective where geese view humans as dangerous predators, such as rural areas where they are hunted. Scarecrows can be made out of almost any

material; however, the design should include movement, bright colors (red, blaze orange, or safety yellow), and large eyes. For maximum effect, the arms and legs should move in the wind, and the scarecrow should be moved once per day.

Geese occasionally will find a swimming pool an acceptable area. Large, blow-up toy snakes are reported to work as a type of scarecrow. Simply buy two or three of these, add weights (sinkers), and put them in the pool. Streamers made of mylar tape may also work if strung across the landing zone.

Noisemaking Devices

Devices that make a loud bang can scare geese, causing them to take flight. Promptness (beginning as soon after the geese arrive as possible) and persistence are the keys to success when using these devices.

Types of noisemakers include propane cannons, blanks, and whistle bombs. Propane cannons are stationary devices that explode propane gas at irregular intervals. Shell crackers and whistle bombs are shells that are fired from a shotgun or special pistol. When fired they either scream for a distance of 50 yards, or explode. Pyrotechnics should only be used by skilled individuals who understand the dangers that these tools can pose.

Loud auditory tactics generally require permits from area police departments and may be restricted in urban areas because of noise ordinances. When such devices are used, it is important that all organizations involved in the process be kept in communication. In addition, the surrounding neighborhood should be advised of what the process is trying to accomplish.

The more geese are exposed to these fear-provoking stimuli, the faster they will become accustomed to them and ignore them. For this reason, noisemakers should be used sparingly, and propane cannons should be set so that they fire only a couple of times per hour.

Lasers

Recent research conducted by the National Wildlife Research Center indicates that relatively low-power, long-wavelength lasers provide an effective means of dispersing geese, gulls, crows, and ravens under low light conditions, while presenting no threat to the animal or the environment. The lower power levels, directivity, accuracy over distance, and silence of laser devices make them safe and effective species-specific alternatives to noisemaking devices.

Although researchers are not sure if birds see the same red spot as people, it is clear that in certain bird species the spot of laser light elicits an avoidance response. The birds view the light as a physical object or predator coming toward them and generally fly away to escape. *Note:* Lasers should never be aimed in the direction of people, roads, or aircraft.

At the time of writing, the cost of a laser device is still quite high. Check with dealers through the Internet and over the counter at bird-control businesses for current prices and instructions for use.

Dogs

When directed by a handler, dogs are the method of choice for large open areas such as golf courses, airports, parks, agricultural fields, and corporate parks. In residential areas, parks with continuous public use, areas bisected by roadways, and large water bodies, dog use may not be appropriate.

Results are often immediate. After an aggressive initial use (several times a day for one or two weeks), geese get tired of being harassed and will use adjacent areas instead.

A dog can be tethered to a long lead (which may require relocating the dog and tether frequently to cover more area), be allowed to chase and retrieve a decoy thrown over a large flock of geese, or be periodically released to chase the birds (if this is not against leash laws).

While the wolflike gaze of border collies is frightening to geese, these dogs rarely harm them. These dogs can be purchased already trained, or be trained; however, it is also possible to hire a border collie "service."

Other breeds of dogs can also do the job. It is recommended that they be from proven working stock, preferably with prior experience with or exposure to live animals, particularly birds.

Chemical Repellents

Taste-aversion products and other chemical repellents are unobtrusive, may be applied directly to the problem area, and will not permanently harm the geese. Drawbacks to repellents include the high costs of covering large

areas, the need for frequent application in rainy areas and during the growing season, odors associated with the few registered products, and their negative influence on the behavior of other wildlife.

If geese have used the area in the past, apply repellent before their return. Carefully read and follow all label and technical directions.

Lethal Control

If the above nonlethal control efforts are unsuccessful and the damage situation persists, lethal control may be an option. Lethal control techniques include legal hunting, shooting out of season by permit, egg destruction by permit, and euthanasia of adults by government officials.

Public Health Concerns

Canada geese are not considered to be a significant source of any infectious disease transmittable to humans or domestic animals, although their droppings are increasingly cited as a cause for concern in controlling water quality in municipal lakes and ponds.

Swimmers itch *(schistosome* or *cercarial dermatitis)* is caused by a parasite that can be spread by goose droppings, but does not mature or reproduce in humans. Recommendations to reduce the risk of swimmers itch are to: (1) vigorously towel off immediately upon exiting the water (including under bathing suits), and (2) take a soapy shower immediately after exiting the water.

If you do get the itch, a topical rash cream should alleviate some of the itching, and the rash should clear up within a week. If you have concerns or questions, contact a physician.

Legal Status

Canada geese are protected under federal and state law and a hunting license and open season are required to hunt them. Where lethal control of Canada geese is necessary outside of hunting seasons, it should be carried out only after the above nonlethal control techniques have proven unsuccessful and only under permits issued by the U.S. Fish and Wildlife Service. Currently, the only agency permitted for lethal removal is the U.S. Department of Agriculture's Wildlife Services.

Additional Information

Internet Resources

Centers for Disease Control and Prevention: www.cdc.gov/

Habitat Modification and Canada Geese: Techniques for mitigating human/goose conflict in urban and suburban environments: www.canadageese.org/nlcontrol.html

Prevention and Control of Wildlife Damage: wildlifedamage.unl.edu/handbook/handbook/

Seattle Audubon's Birds of Washington State: www.birdweb.org/birdweb/

Wildlife Control Supplies: www.wildlifecontrolsupplies.com/

Adapted from "Living with Wildlife in the Pacific Northwest" (see http://wdfw.wa.gov/wlm/living.htm)

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Illustrations: As credited

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