



Marion Soil and Water Conservation District (MSWCD) Natural Resources Committee Meeting Agenda

Wednesday
April 16, 2025
9:30 AM to 11:00 AM

Our mission is to partner with people in support of thriving lands, clean water, and healthy habitats. We do this through planning, technical assistance, funding, and education.

This meeting will be held by video conference (Zoom), and by telephone.

Call In Number: 1-253-215-8782 | **Meeting ID:** 838 1782 7407 | **Passcode:** 507254

Staff Contact: Cesar Zamora | cesar.zamora@marionswcd.net

Committee members are reminded to disclose any actual or potential conflicts of interest prior to discussion of relevant agenda items.

Agenda Changes and/or Additions	Chair
1. Public Comment	Chair 5 minutes
2. Board Updates on Committee Recommendations	Chair 5 minutes
3. Approval of March 12 th Meeting Minutes Action	Chair 5 minutes
4. ODA Scope of Work Focus Area-Agriculture Water Quality Plan Discuss	Staff-Pineda 10 minutes
5. Should the District Provide Comment on Projects? Discuss	Sanchez 15 minutes
6. Introduction and Discussion-Landscape Resilience Grant Proposal for Emerald Ash Borer Discuss & Recommend	Staff-Blank & PRWC 15 minutes
7. Plant Health Conservation Practice Discuss	Chair 15 minutes
8. Cattleman's Associations Wildlife Damage Prevention and Compensation Program Discuss	Chair & Sanchez 10 minutes
9. Help Facilitate City of Salem Planning Commission Meetings Discuss	Sanchez 10 minutes

Meeting Adjourned - Chair

Marion Soil and Water Conservation District complies with the American with Disabilities Act (ADA) and does not discriminate based on race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. If special physical, language, or other accommodations are needed for this meeting, please advise the District Manager at 503-391-9927 as soon as possible, and at least 48 hours in advance of the meeting.

Oregon residents can file a written grievance with the Marion SWCD regarding a violation of the Public Meetings Law within 30 days of the alleged violation. The grievance should include details about the alleged violation and be submitted to the Marion SWCD District Manager for review.



**Marion Soil and Water Conservation District (MSWCD)
Natural Resources Committee Meeting Minutes March 12, 2025 DRAFT**

2:01 PM to 3:10 PM

Facilitator: Cesar Zamora

Recorded by: Chelsea Blank

Approved:

Committee Member Attendance

Cesar Zamora (Committee Chair) - Staff	Present
Rochelle Koch - Director	Present
Nik Ovchinnikov - Director	Present
Chelsea Blank - Staff	Present
Leland Hardy - Associate Director	Present

Staff

Guests

-
- Sarah Hamilton
 - Susan Ortiz
 - Becky Pineda
 - Kassi Roosth
 - Brenda Sanchez

Note: All documents and materials displayed or referenced are retained in the Administrative Committee Meeting file at the Marion Soil and Water Conservation District (Marion SWCD or District).

Minutes

Call to Order-Chair: 2:01 PM

Announcements - None

Agenda Additions or Changes - None

Public Comment - No Comments

1. Staff Updates

Blank gave an update that her and Hamilton have been attending monthly partnership meetings about the Emerald Ash Borer invasive pest and that they are planning to continue to explore options to address this resource concern issue with watershed councils. The invasive pest has been found in Marion County as of August of 2024.

Hamilton gave an update about the success of the native plant sale that concluded early this month. The sale went smoothly, and she will be following up soon with a report of the numbers from the sales to the Natural Resources Committee.

Ortiz gave an update that the third cycle of the Conservation Assistance Grant program is currently underway and in the middle of the external evaluation process. There are currently nine CAG applications submitted for funding, with the total request for this cycle at over \$92,000. The CAG review committee is planning to meet on Monday March 17 to discuss recommendations for funding these applications to the Board.

2. Elect Committee Chair

Action: Koch motioned to **elect Cesar Zamora as the Natural Resources Committee Chair**, 2nd by Ovchinnikov. No further discussion. MOTION PASSED (Aye-5 [Zamora, Ovchinnikov, Koch, Hardy, and Blank], Opposed-0).

3. Pesticide Stewardship Partnership (PSP) 2025-27 Grant Application

Zamora presented the Pesticide Stewardship Partnership grant application that has been drafted and ready for submission to Oregon Department of Environmental Quality (ODEQ) in April of 2025 to continue efforts of collecting water quality samples in five locations in the Molalla Pudding River subbasin. Included in the proposal are three outreach events hosted by the District to educate landowners on the best management practices for urban areas, a spray calibration workshop, and a trainer workshop.

Zamora presented an overview of the staff activities and budget, which totals \$32,676 requested. ODEQ has requested that the District collect double the amount of samples than we have previously collected, due to increased amounts of pesticides of high concern that have been found in this waterway. Sanchez, Koch, and Ovchinnikov expressed concerns about the District getting involved with this type of project that may potentially lead to compliance enforcement on landowners using the data collected by our staff. Ovchinnikov expressed the need to know how the results of the samples will be used before the Board can approve of us participating in this program. The committee discussed the time restraints on researching this in depth before it needs to be submitted to ODEQ on April 4, 2025. Koch suggested we move forward with the PSP application if we can get participation from the Pudding River Watershed Council (PRWC) to take on the sampling role, and the District can just focus on the outreach component so that we are not involved with any of the implications of the data. Zamora agreed to reach out to the PRWC to see if they are interested in this partnership before we need to submit this grant to the Board packet items on March 20th. The committee will meet briefly on March 20th to discuss if this will be recommended to the Board with the suggested changes made.

Action: Koch motioned to **work with the Pudding River Watershed Council to conduct the Pesticide Stewardship Partnership monitoring**, 2nd by Ovchinnikov. No further discussion. MOTION PASSED (Aye-5 [Zamora, Ovchinnikov, Koch, Hardy, and Blank], Opposed-0).

4. Oregon Climate and Agriculture Network (OrCAN): Soil Health Network

Zamora presented the background and summary of the new Soil Health network launched by OrCAN. OrCAN is searching for partners to volunteer as regional hubs for the soil health network. The focus is on providing technical assistance and connecting landowners to opportunities for soil health. The hope is to establish these pilot hubs in the Spring of 2025. OrCAN will provide training for the lead partners to learn how to be a hub. The committee discussed how this will help connect landowners to the District and how much staff time will be required. Zamora responded that OrCAN is open to being flexible on the capacity requirements based on partner needs. Ovchinnikov expressed an interest in learning more about this initiative and requested that more information be sent in an email.

Action: Zamora motioned to **recommend that the District become one of the regional hubs for the OrCAN Soil Health Network**, 2nd by Ovchinnikov. No further discussion. MOTION PASSED (Aye-5 [Zamora, Ovchinnikov, Koch, Hardy, and Blank], Opposed-0).

5. Conservation Cover Program and Adding Hedgerows

Zamora suggested we skip this item as there was no feedback from the previous Board meeting about this topic, besides the committee needs to continue to develop this program. A suggestion from Koch is that the Hedgerow practice #422 be added to the Conservation Cover program, which segues into the next agenda item.

6. Hedgerows in Conservation Cover Program

Based on Board feedback that it would be helpful to include the Hedgerow practice #422 in the Conservation Cover program, Zamora presented a slide with suggestions of how to incorporate this into the program. Zamora presented a list of discussion questions including how many payments should be offered and at what rates, and that this be based on the NRCS standards and definitions of the hedgerow practice. Zamora showed that the 2024 NRCS cost scenario lists show \$8-\$13 per foot of hedgerow as their payment rate. Koch asked if we would require the use of native plants. Ovchinnikov suggested adding a recommendation for the use of native plants but allowing the use of nonnative plants for other goals such as a drift screen. Zamora suggested adding an

incentive for the use of native plants, like the higher payment rate in the Cover Crop program for no till practices. The committee continued the discussion of what different goals would be included in the use of the hedgerow practice such as a drift screen, pollinators, and aesthetics. The implementation requirements would be different depending on each of these goals. For drift, the plant recommendations would be more evergreen species, densely planted, and taller trees. Zamora suggested that the implementation requirements for the drift screen goal would adhere to the Endangered Species Act pesticide mitigation rules that are going to be implemented soon. For pollinators, the recommendations would focus on native plants, deciduous and diversity. Zamora also suggested that this program will need to have high enough incentives to make it worth it for farmers to participate. Blank stated that Karlynn Wierer provided a higher payment rate in a separate conversation about the hedgerow practice in a question about a CAG application. The rate given by Wierer was \$13.45, which suggests that the rates have increased since the 2024 NRCS cost scenarios were published. Blank suggested working with NRCS staff to get the most updated information about the practice to be used for this program. Ovchinnikov asked what defines a small farm, to which Pineda responded that it is based on Annual Gross Income of the farm rather than acreage.

Pineda recalls the AGI maximum to be \$350,000 to be considered a small farm. Regarding how many payments are made for this program, Zamora stated that this decision will impact staff capacity to implement the program. Koch stated that she would prefer it if the staff could present options for this decision to the committee rather than brainstorming together during the meeting. Ovchinnikov suggested a structure with two payments; one upfront of 75% of the costs, then the final 25% paid at project completion. Zamora gave the example of the Cover Crop program which pays 50% before and after project implementation. Koch and Ovchinnikov both agree that the 75% and 25% payments would be more beneficial for farmers. This program development will continue in the Natural Resources committee.

7. Scheduling next Natural Resources Committee meeting

Zamora asked if this time of the week and month works for the committee to keep as the regularly scheduled timeslot. The committee all agreed that the second Wednesday of the month during the morning works. Hardy said that he prefers later morning around 9:30 or 10 am rather than 9 am if possible. The committee agreed that 9:30 am will work. Blank asked if the committee plans to meet in April. Zamora confirmed that the committee will need to meet as there is already one agenda item needed for discussion and recommendation. Blank said that additional agenda items may be needed for the April committee meeting for the watershed councils to attend and give an update on their projects. Blank stated that the next second Wednesday of April will be during the

CONNECT conference, which most of the District staff are planning to attend. The committee discussed an alternative time to meet in April, agreeing on April 16th at 9:30 am.

Adjourn: Chair Zamora adjourned the meeting at 3:10 PM



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**Marion Soil and Water Conservation District
Natural Resources Committee Meeting – Agenda Item Brief**

Agenda Item Name: ODA Scope of Work Focus Area – Agriculture Water Quality Plan

Date: 04-16-2025

Agenda Item Brief:

Discuss the Scope of Work and Focus Area Action Plan for our Ag Water Quality program moving into the next biennium with ODA.

Requested Action:

Discuss

Proposed By: Natural Resources Committee



Marion Soil and Water Conservation District Natural Resources Committee Meeting – Agenda Item Brief

Agenda Item Name: Should the District Provide Comment on Projects?

Date: 04-16-2025

Agenda Item Brief:

The Oregon Department of State Lands has reached out to the district and invited us to provide comment on a project application that includes the removal/fill of a wetland or waterway.

The Natural Resources Committee will discuss whether the District should provide comments on projects and to what extent.

Requested Action:

Discuss

Proposed By: Natural Resources Committee

FW: Opportunity for Public and Agency Review and Comment: APP0065508

From Office Marion <office@marionswcd.net>

Date Thu 2025-04-03 9:28 AM

To Brenda Sanchez <Brenda.Sanchez@marionswcd.net>



Tom Wilson (he/his)
Admin Asstistant

The Marion SWCD is an equal opportunity employer, providing services to the public without regard to race, religion, color, sexual orientation, gender identity, national origin, mental or physical disability, marital status, age or other protected status or activity in accordance with applicable law.

From: Department of State Lands <support.services.cf@dsl.oregon.gov>

Sent: Thursday, April 3, 2025 8:48 AM

To: Office Marion <office@marionswcd.net>

Subject: Opportunity for Public and Agency Review and Comment: APP0065508

Re: APP0065508, Marion County, West Fork Little Pudding R, 07S02W05D, Latitude 44.988900, Longitude -122.955624

The Oregon Department of State Lands (DSL) received an application for a project that involves removal or fill activity in a wetland or waterway. We are notifying you of the opportunity to comment on the application. You can view the application via our website:

https://url.avanan.click/v2/r01/_https://lands.dsl.state.or.us/index.cfm?fuseaction=Comments.AppDetail&id=65508_.YXAzOm1hcmlvbnN3Y2Q6YTpvOjkxMWFiMGVmMDZlODNkOWE1NzBjZGJiMTU0N2MxZjYyOjc6YWVmZDo4ZThIMmExM2RjYTkjMzRiNDA3OThlYmM3MGQ4MTE5Nzc1MwVhYjIjZDhiOTc2NTk3NTg0N2lwYzY0MmYxMDhiOnQ6VDpQ

The comment period on this application ends at 5:00 pm on May 2, 2025.

All comments will be considered before a decision is made on the application. Copies of the applicable laws and rules are available on the DSL website at

https://url.avanan.click/v2/r01/_http://www.oregon.gov/dsl/Laws/Pages/LawsRules.aspx_.YXAzOm1hcmlvbnN3Y2Q6YTpvOjkxMWFiMGVmMDZlODNkOWE1NzBjZGJiMTU0N2MxZjYyOjc6YWU5YzpkM2FIOWEzY2UxY2QxMzQzODk5YTk1OGMxMzI4MzIxMWJkMzYwNzU0YUWU3Zjg1ZDhhYzhiNThiMWYzMWVjZWNiOnQ6VDpQ. You may also submit comments via US mail or fax. You may request a paper copy of the application by calling DSL. If your project is west of the Cascades call the Salem office at (503) 986-5200; for projects east of the Cascades call the Bend office at 541-388-6112. Please have the application number and county name ready. DSL may charge a copying fee for this service.

Thank you.



Marion Soil and Water Conservation District Natural Resources Committee Meeting – Agenda Item Brief

Agenda Item Name: Introduction and Discussion – Landscape Scale Restoration Competitive Grant Proposal for Emerald Ash Borer

Date: April 16, 2025

Agenda Item Brief: Due to the recently discovered and confirmed Emerald Ash Borer infestation in Marion, Clackamas, and Yamhill counties that occurred as of August of 2024, Marion SWCD and Pudding River Watershed Council have been attending regular subcommittee and partner meetings to develop and discuss plans for managing the invasive species in the Pudding River watershed. We have been learning from ODF and ODA about methods and strategies being used in Washington and Multnomah counties for addressing the EAB infestation that has been confirmed in those areas as of 2022. From our conversations with ODF EAB specialists, Kat Bethea and Matt Mills, the best step for our infestation area is to start with inventories and surveys of both what we have at stake in terms of our Oregon ash (target host species) and EAB infestation boundaries. Last summer of 2024, ODA and ODF had funding to provide staff to complete on the ground visual surveys of the known infestation areas, however their time for these surveys was limited, as Oregon ash trees lose their leaves starting in September or October, so they were only able to do minimal surveys before winter. This year, ODA will not receive funding for visual surveys for EAB anymore, so it is up to countywide efforts to keep these surveys going. Pudding River Watershed Council is planning to apply to the Landscape Scale Restoration (LSR) Grant to receive funding for visual surveys of Oregon ash trees in the Butte Creek infestation area to determine the scope of the infestation size and severity before planning on the ground projects. This will help prioritize highest risk areas, facilitate landowner outreach and education, and determine highest impact areas for implementing future projects such as Slow Ash Mortality (SLAM) and underplanting.

Landscape Scale Restoration Grant Program (LSR) Overview: The Landscape Scale Restoration (LSR) Competitive Grant Program supports high impact projects that promote collaborative, science-based restoration of priority forest landscapes, leverage public and private resources, and advance priorities identified in a State Forest Action Plan or other restoration strategy.

The objective is to focus competitive LSR funds on activities that address priority areas, challenges and opportunities facing western lands. Funding for the LSR Competitive Process is made possible through the USDA Forest Service.

WFLC is charged with delivering the LSR competitive grant process in the West. Our LSR grants team reviews, scores, and makes recommendations on project proposals from

western states and Pacific Island territories, which are passed along to the WFLC membership for approval. Proposed projects recommended for funding are then sent to the Forest Service.

- Pre-proposal deadline: May 18, 2025
- Actual Grant application period: August 2025-December2025
- Match funds are not required to be secured at the regional level at the time of application. Match funds are only needed at time of award.
- Can award up to \$300,000 with a 1:1 match

The formal grant application and Letter of Support will be brought to the committee for recommendation for Board approval in July 2025.

Requested Action: Recommendation: Marion SWCD to be listed as a contributing partner in the Landscape Scale Restoration Grant pre-proposal.

Proposed By: Pudding River Watershed Council, Chelsea Blank (staff).



Marion Soil and Water Conservation District Natural Resources Committee Meeting – Agenda Item Brief

Agenda Item Name: Plant Health Conservation Practices

Date: 04-16-2025

Agenda Item Brief:

The Marion SWCD Board of Directors have asked the Natural Resources Committee to discuss what type of projects the District should fund under the “Plant Health” conservation practice.

Requested Action:

Discussion

Proposed By: Natural Resources Committee



GOALS for the next five years

1 Inspire Conservation

People and communities conserve natural resources because they understand that their own wellbeing is connected to the environment.

2 Healthy Soil and Clean Water

Soil resources are healthy, productive, and protected from erosion and deterioration. Water resources are conserved and managed to be clean and cool to support all beneficial uses.

3 Healthy Habitats

Healthy, connected, and diverse habitats support humans and wildlife of all kinds.

"The SWCD's sweet spot is the intersection of people and place. It's less on-the-ground restoration and conservation, vs. working with people to get the resources and information they need to do the work."

--Staff Member



4 Productive Working Lands

Farms, ranches, woodlands, and other working lands sustain healthy human and natural habitats, while supporting regional food and fiber systems for current and future generations.

5 Effective Partnerships

The District engages in strategic partnerships to align priorities, pool resources, and leverage strengths, creating a synergy that leads to innovation, enhanced productivity, strong performance, and lasting conservation impact.

6 Strong Organizational Health

Marion SWCD is a great place to work and volunteer and a responsible steward of public funds.

"The history of the SWCDs is a distinctive legacy of stewardship approaching 100 years. The quality of nature and healthy food is really in the hands of the people making these [stewardship] decisions, and the information they have and the options they learn about." --MSWCD Partner

CAG 20-25-021

Aurora blueberry overhead evaporative cooling

- Practices:
 - 442 - Sprinkler System 9.00 acres
- Headwaters Pudding River
- Match Funding : \$15,889.00 / Marion SWCD: \$10,000.00
Total Project Budget: \$25,889
- *Water Saving: not applicable; project is plant health and productivity*

**AURORA OVERHEAD BLUEBERRY
EVAPORATIVE COOLING**

<p style="text-align: center;">CONSERVATION PRACTICE</p> <p style="text-align: center;">442 Sprinkler System</p> <p>9 Acres Watershed: Headwaters Pudding River Drip irrigated blueberries with a grass cover between rows.</p>	
<p style="text-align: center;">RESOURCE CONCERNS</p>	
<p>Plants: Productivity, Health and Vigor Air Quality: Adverse Air Temperature Water Quantity: Inefficient Water Use on Irrigation Land</p>	<p style="font-size: small;">Eastern Block of Aurora Blueberries adversely affected by high heat (2/8/2021)</p>
<p style="text-align: center;">SOLUTIONS</p>	
<p>442 Sprinkler system Overhead sprinkler on automatic controller to control air temperature Plant Productivity, Health and Vigor Water Quantity, Air Quality</p>	 <p style="text-align: center;">MARION COUNTY, OREGON SIC 20 T15 R1W R2E4 Project Location within Marion County</p>
 <p style="font-size: x-small;">Marion Soil & Water Conservation District 408 N. 3rd Ave. Dayton, OR 97103 503.293.1927 www.marionswcd.net</p> <p style="font-size: x-small;">The Marion SWCD is an equal opportunity organization providing services to the public without regard to race, religion, color, gender, ethnicity, gender identity, national origin, marital or marital status, sexual orientation, age, or other prohibited status or status in accordance with applicable law.</p>	 <p style="font-size: x-small;">Western Block of Aurora Blueberries doing well (2/8/2021)</p>



Marion Soil and Water Conservation District Natural Resources Committee Meeting – Agenda Item Brief

Agenda Item Name: Cattleman’s Association Wildlife Damage Prevention and Compensation Program

Date: 04-16-2025

Agenda Item Brief:

The Oregon Cattleman’s Association is launching a pilot program aimed at addressing damage done to agriculture due to wildlife. At the March board meeting a representative from the Cattleman’s Association sought support from Marion SWCD for the program and suggested that the SWCDs can run/administer the Wildlife Damage Program.

Establishment of the pilot program will require administrative staffing, a crop and structure damage adjudicator and a pasture/forage/rangeland damage adjudicator. Adjudicators may need to be hired through private contracts.

Requested Action:

Discuss

Proposed By: Natural Resources Committee




Wildlife Damage Pilot Program

From Dennis Sheehy <sheehycaps@gmail.com>

Date Tue 2025-02-11 4:01 PM

To Brenda Sanchez <Brenda.Sanchez@marionswcd.net>

 2 attachments (63 KB)

Wildlife Damage Prevention and Compensation Program Working Draft 5 1-16-25.docx; Wildlife Damage Insurance WAD (Draft 3) 1-17-25.docx;

Hi Brenda,

Thank you for taking the time to visit with me. I have attached a file "Wildlife Damage Prevention and Compensation Pilot Program" that provides a look at what the OCA is trying to do, and a potential statewide "structure" for a pilot program.

Currently, this is regarded as a pilot program designed to provide information about design of the structure and the prevention and compensation components for the state legislature's House Committee on Agriculture, Land Use, Natural Resources, and Water.

The second attachment presents the concept for a Group Risk Insurance Program administered by the state to address compensation.

I will try to get on the virtual for the SWCD meeting on March 5.

The link to the pilot program Dashboard is <https://arcg.is/1Submb0>

Thanks,

Dennis P. Sheehy (Oregon Cattlemen's Association, Wildlife Committee Co-Chair)
541-398-0224



Wildlife Damage

From Dennis Sheehy <sheehycaps@gmail.com>

Date Fri 2025-03-28 9:20 AM

To jordan@yamhill.swcd.org <jordan@yamhill.swcd.org>; Ray Monroe <doryfreshfish@embarqmail.com>; Whitney Rohner <swcdwhitney@gmail.com>; Brenda Sanchez <Brenda.Sanchez@marionswcd.net>; Cynthia <cynthia.a.warnock@gmail.com>

Just letting you know that HB 3657 Wildlife Damage legislation has passed out of committee with a unanimous vote by members of the Water, Natural Resources and Wildfire Committee. The next step is getting funded by the Ways and Means committee. If it funded, then it has to be signed off by the governor,

Relative to testimony presented to the committee, all testimony was positive except for written testimony presented by the usual coalition of environmental and anti-livestock-farming groups. Their testimony was listed as neutral, which might help it get signed by the governor if it gets to her desk.

Rep. Levy told the Ways and Means committee that the Wildlife Damage bill was a priority bill that she really wanted to have funding.

The Re-insurance bill was pulled from the general session because Rep. Levy thought it needed more work prior to going to committee. She is working on it with several private insurance companies, and hopes to submit it to the short session of the legislature.

Thanks,

Dennis P. Sheehy

DRAFT 5: 11/15/2024 --Please do not circulate
(Oregon Wildlife Damage Group Risk Insurance Program – Draft 5 – E.docx)

OREGON WILDLIFE DAMAGE COMPENSATION
(Group Risk Insurance Program)

Background

Monetary compensation to owners of private property for damage caused by state-owned wildlife has been difficult to achieve. The Wolf-Livestock Compensation and Benefit Program, established and funded by the state to compensate livestock owners for mortalities and injuries to livestock, has failed due to insufficient funding as the state’s re-introduced wolf population has grown and spread. Compensation for other types of state-owned wildlife damage has not been addressed. This white paper presents a different approach to monetary compensation for damage to private property by state-owned wildlife.

Oregon Department of Administrative Services – Risk Management (DAS-RM) Program provides insurance that protects people, property and activities (*liabilities*) of state government. Its experts recommend mitigation strategies to minimize or prevent the cost of losses, both minor and catastrophic. When losses do occur, the DAS-RM manages the claims process allowing state agencies to fiscally recover and continue their missions.

The DAS-RM program, “insures what others won’t: the unique, diverse and often hazardous business of state government.” ORS 278 provides DAS-RM the authority and responsibility to manage all risk management and insurance programs for all branches of state government. The risk management program oversees a wide variety of coverages that include **agency property**, agency tort liability and workers compensation. The risk management program **uses a mix of commercial coverages and self-insurance to manage risks.**

As Oregon Revised Statute (ORS) 498.002 states, “Wildlife is property of the state.” But the definition of property in this regard is different from its normally understood definition. Since as early as 1917 (from a New York court case and appeal concerning beaver damage) courts have held that wildlife is held by states in their sovereign capacity for the benefit of all the people, not as a private right of the state itself, and therefore, the state has no liability for damage caused except as it specifically accepts.

Recognizing wildlife as state property to insure against damage to private property is within the state’s power. It is fundamentally no different from the state recognizing for insurance purposes, buildings, vehicles, and other property that is owned, controlled, managed, and insured by the state through DAS-RM.

Wildlife Damage Group Risk Insurance Program

The intent of the Wildlife Damage Group Risk Insurance Program is to provide insurance coverage to owners (and other legal holders) of private property that are, or could be, affected by wildlife damage. The proposed state managed insurance program is similar to a group risk insurance plan that will provide coverage in areas of the state affected by wildlife damage. The property that would be insured against wildlife damage includes forage, crops, structures, and facilities that are on private land or legally occupying public lands. The program will be structured and managed in consultation with DAS-RM.

DAS-RM would develop and facilitate the wildlife damage insurance program in-house, by contract with approved private insurance companies (API), or a combination, through state allocated funding and individual policy holders' premiums, for damage to private property by wildlife.

Responsibilities of DAS-RM include:

1. Design, with appropriate inputs from private insurers and affected property holders, wildlife damage insurance policies that will cover damage to agricultural production on private and legally occupied public lands, and potentially, other types of wildlife damage,
2. Negotiate premiums and contract with API to provide basic and enhanced policy coverage for owners (and other legal holders) of private property subject to wildlife damage,
3. Set land owner (or other legal holder) premiums and provide additional state resources to fund the program.

Types of wildlife damage to be covered by a Group Risk Insurance Policy (GRIP):

Damage to agricultural production caused by wildlife. The **Damage to Agricultural Production Policy** will provide insurance coverage to owners and other legal holders of private agricultural property damaged by wildlife (i.e. elk, deer, pronghorn, turkey, geese, and other wildlife) as determined through underwriting and with inputs from the Oregon Department of Fish and Wildlife (ODFW) and the county (or area or regional) Wildlife Damage Committee. The policy will cover damage, on private or on legally held public land, to forage crops (rangeland and pasture), field crops (hay, grain, etc.), and specialty crops (alfalfa, mint, canola, orchards, row crops, etc.) and facilities and structures associated with agricultural production.

County Wildlife Damage Committee (WDC) (See Appendices for detail)

Each county or region will empanel a Wildlife Damage Committee comprising DAS-RM and AIP representation, policy holders, ODFW and Wildlife Services representatives, and other stakeholders. It will:

1. Determine annually the value of crops including forage from pasture and rangeland.
2. Verify acreage of crops covered.
3. Verify volume, quality, and value of, and damage to stored, insured products.
4. Determine wildlife damage to facilities and structures
5. Provide local data to aid in establishing the various underwriting metrics
6. Coordinate required prevention and protection practices.
7. Collect policy holder coordinating fees.

Group Risk Insurance Policy (GRIP) components: (See Appendices for detail)

1. Coverage: For **Damage to Agricultural Production** policies:
 - a. Units of coverage will be areas of private or public land, in acres, legally held by the policy holder that contain cropland, pastureland (either dryland or irrigated), rangeland, forest land, or any combination of these lands, and
 - b. all of the irrigation systems, fences, structures, and other machinery and facilities associated with the insured operation, and
 - c. all of the crops grown and harvested from these lands.
2. Damage Value: (see Appendix for more detail)
 - a. Values for field and specialty crops by stages of growth and costs incurred in their establishment, cultivation, harvest, and storage will be established annually.
 - b. The value of private land and public land forage will be established annually
 - c. The repair or replacement cost of damaged facilities and equipment will be appraised individually as damage occurs.
3. Policy holder costs:
 - a. Each policy holder will pay annual premiums based on the number of acres and crops insured and/or on the facilities and structures (not otherwise insured) insured. The premiums will be set by DS-RM and the AIP.
 - b. Each policy holder will pay annual program fees to the local WDC to administer and coordinate the program.
4. Measuring wildlife caused damage to production:
 - a. **Damage Done** assessments are done where direct measurements or appraisals can be done by a damage adjudicator. (See Appendix)

b. **Damage Take** assessments measure damage indirectly, usually on pasture or rangeland, by multiplying the daily forage intake of the species (by class) by the number of days the animal uses the pasture or rangeland. (See Appendix)

Appendices

Appendix I: Wildlife Damage Committee (WDC) responsibilities

1. In cooperation with the Oregon Department of Administrative Services Risk Management Division (DAS-RM), each local (county or region) WDC will register participants in the program and administer the program at the county or regional level. It will:

a. **For Damage to Agricultural Production Policies, gather or cause to be gathered:**

(1). data to establish the costs of each step in the land preparation, production, harvesting, storage of, and total value by traditional units of measure of specialty crops, field crops, forage crops including rangeland forage, and the facilities and structures required in their production. If sufficient local data is not available, data from the nearest market with adequate data will be utilized.

(2). Data to establish the timeline of cultural practices, stages of growth, harvest dates and methods, and storage in-dates and out-dates.

(3). Data to facilitate adjudication of Damage Done and Damage Take claims.

Appendix II: Damage Done

The damage done basis of assessing wildlife caused damage is most applicable to crops and cropland, facilities, and fixtures. For cropland the primary damage occurs from the reduction in productivity caused by animal consumption of the crop, trampling of the crop, and soil disturbance. Damage done also applies to fixed assets such as fences, irrigation equipment and infrastructure, stored crops such as hay, hay sheds, feeding equipment, etc. Both types can be assessed by a qualified damage adjudicator for each damage event, with compensation determined by diminished crop units (of accepted standard measure), cost to re-establish or renovate, cost of replacement or repair, and the labor costs involved.

Information can be gathered through direct observation or remote monitoring using drones, trail cameras, and phone cameras. Information acquired from the different techniques can be pooled to determine the type, extent, and value of damage. An assessment of crop productivity at harvest would be made to determine the total amount of loss and the value of the losses.

Cropland monitoring to identify wildlife as the damaging agent can be accomplished by:

a. obtain an estimate or count of the number and kind of wildlife causing the damage by direct count if possible and by photos or videos to show the animals on the insured crop.

b. Record the location, dates, habitat type or crop to verify that the field/crop is covered in the policy.

c. Schedule a site visit by the crop adjudicator to determine the value of the damage.

d. Submit the evidence to the Wildlife Damage assessment team (i.e. insurer, DAS-RM, Wildlife Damage Committee etc.

Appendix III: Damage Take

The Damage Take basis of assessing wildlife damage is especially useful for evaluating wild ungulate forage consumption at landscape scale (large open pasture and rangeland.) At this scale, damage compensation would be based on the amount of forage consumed by ungulate wildlife for the duration of time the animals were on the pasture or rangeland, with compensation based on the value of the forage consumed (and possibly other damage done.) The procedure to determine forage take and the compensation value is similar to the process used to determine the value of forage consumed by domestic livestock.

Landscape-scale consumption of forage by wildlife can be determined by using aircraft to monitor seasonal use on private and public lands. Periodic flights along permanent transects can be used to obtain an estimate of seasonal wildlife use. During each flight, the location and number of targeted wildlife along the transect can be recorded and evaluated. Transects can be flown at defined intervals (Subject to weather conditions) during winter, spring, summer, and fall seasons. Direct monitoring by policy holders can be obtained by:

a. Using phone cameras to record videos of wildlife use of rangeland and pasture forage and damage done to structures and facilities,

b. Trail cameras along wildlife travel routes within and between seasonal ranges from rangeland to cropland can be used to determine time and duration of the damage event, and

c. periodic aircraft and/or drone flights can be used to establish wildlife numbers and locations.

d. Information collected by these methods can be consolidated into a policy holder's damage files. Recurring damage on a daily or weekly basis should be recorded for each event. At the end of each season, and assessment of total damage can be made by the assessment team to determine the total loss from wildlife damage and its value.

The procedure to determine the forage portion of Damage Take for ungulate wildlife and its compensation value is:

a. Establish an Animal Unit Equivalent (AUE) for the wild ungulate. Using elk as an example, the average weight for elk is about 600 lbs. or about half the value used for a beef cow AUM which is calculated using 2.5% of forage dry matter consumed per day or about 30 lbs. dm per day or about 900 lbs. dm for a 1,200 lb. cow per month. $2.5\% \text{ of } 600 = 15 \text{ lbs dm per day for an average elk.}$

b. Determine the number of elk using the insured area by periodically counting adult elk using aircraft, drones, transects, etc. and record the date and numbers at specific locations.

c. Establish a current market value for the forage consumed based on the value assigned to forage consumed by domestic ungulates (e.g. The cost to graze a cow-calf pair on leased pasture during the summer is about \$26.00 per month.)

d. Calculate the value of the forage consumed by the elk and adjust by the level of the insurance policy coverage using the “Coverage Level” metric and the “Market Protection Factor”.

Oregon Wildlife Damage Prevention and Compensation Program

12/18/24

Draft #3 (Not for Distribution)

Oregon Cattlemen's Association

Prepared by: Wildlife Committee (Dennis P. Sheehy, Shane Gomes, Jon Elliot, and Bob Levy)

1. Introduction

Depredation of private property by wildlife (i.e., economic loss caused by damage to crops, forage, livestock, infrastructure or facilities) is a contentious issue between property owners and the Oregon Department of Fish and Wildlife (ODFW). Property owners have complained that damage by wildlife, especially by large ungulate grazers in the past, and now livestock by large carnivore predators, is causing them significant monetary loss.

Since the 1970s, there has been considerable funds spent, studies made and effort expended by state wildlife departments, federal resource management agencies and property owners to resolve the issue of wildlife depredation. Despite these efforts, many property owners subject to ongoing wildlife depredation consider current damage to crops, forage and livestock to be escalating, and ODFW's response to wildlife damage inadequate.

While wildlife depredation can affect all property owners, it is ranchers and farmers that are becoming increasingly susceptible to damage caused by wildlife. Wildlife responsible for most current damage to private property includes:

1. large carnivores (Coyote, Black Bear, Mountain Lion, **Wolves**),
2. large ungulate wildlife (Deer, **Elk**, Pronghorn) and
3. resident (**Turkey**) and migratory (**Geese**) game birds.

Wildlife caused damage to private property is a statewide issue. While the damage to private property is not directly the fault of the wildlife or the state, the state has legal and management responsibility for most wildlife. Consequently, damage to private property by wildlife should be addressed by the state. .

Owners of private property, especially farmers and ranchers, want to find equitable solutions to the problem of wildlife damage to private property. Currently, wild ungulates (elk and deer) are the primary huntable wild ungulates in Oregon, and the primary prey species for large carnivore predators. Ranchers with livestock also recognize that a significant decline in wild ungulate numbers will increase large carnivore predation of livestock as livestock become the primary prey species for all predators.

There is a developing consensus among owners of private property that poor condition of public land habitat is a major factor influencing wildlife, especially large ungulate wildlife, to seek out habitat on private property. Changes to public land rangeland and forested habitat on public land that contribute to wildlife use and potential damage of private property include: i) poor structural characteristics of forested habitat on public lands provides less security and shelter for wild and domestic ungulates, ii) lack of managed timber harvest to create openings in the forest canopy to promote growth of herbaceous forage, iii) inadequate "backgrounding" of forage by domestic ungulates to improve

nutritional content of forage for large wild ungulates and reduce herbaceous fuel loads, and iv) increasing dominance of both public and private rangeland and forest habitat by invasive and weedy vegetation.

2. Causes of Wildlife Damage.

A successful Wildlife Damage Prevention and Compensation Program requires knowledge and understanding of the reasons that damage is occurring, the places it will probably occur, and the time at which it will occur. Fundamental to this understanding is the recognition that Oregon's landscape is comprised primarily of watersheds. This landscape pattern repeats itself throughout the state, ranging from large river drainages to small stream tributaries. Within the general pattern of watersheds, topography has a similar land form consisting of valleys, adjacent lower elevation hill-land terrain, and higher elevation mountainous terrain. As a result of this typical topographic pattern, valleys and lower elevations are the location of most privately owned land and the site of associated developments. In contrast to lowlands, uplands are less developed, and tend to be public lands managed by public agencies.

Landscape Characteristics.

The physical attributes (i.e., land-form, topography, elevational gradients, water sources, vegetation, etc.) of a watershed, or any part of the watershed, are a major determinant of land use, and the purpose for which the land is used. Intensive crop agriculture (i.e., specialty crops, hay and grain, irrigated pasture, etc.) is generally associated with lower elevation valleys of watersheds due to the availability of fertile soils and water for irrigation. Lower elevations are also the location of most transportation corridors, farms and ranches, industrial sites, and cities and towns. Lower elevation hill-lands connected to valleys were previously used primarily for livestock grazing and/or dryland crop production. While still used primarily for livestock grazing, most of the former dryland crop ground is no longer farmed unless underground aquifers provide water for irrigation. Naturally wet or irrigated pastures associated with cropland are important sources of feed for wild and domestic animals.

Prior to settlement and extensive development, valleys and lower to middle elevation cropland and pastures were important spring/fall or winter habitat for wild ungulates, migratory waterfowl and resident game birds. Middle and higher elevations of watersheds are typically grassland and forest habitat used to graze livestock, harvest timber for wood products, hunting and recreation. Higher elevation grassland, forest and alpine was, and still is, important summer habitat for wild ungulates, game birds and other wildlife.

Over 51 % of the land area of Oregon is public land managed by the federal government agencies. Public land use was oriented towards grazing by domestic ungulates, timber harvest, mining, hunting, and recreational activities. Although large tracts of privately owned forest and rangeland exist in Oregon, the majority of higher elevation rangeland and forest grazed by wild and domestic ungulates is public land managed by the Bureau of Land Management or the Forest Service. Currently, recreational use is becoming the most important use. On both private and public rangeland, livestock are generally extensively managed, and have grazing behavior similar to wild ungulates.

Landscape-Scale Issues

Most property owners engaged in crop agriculture and/or livestock production relate to the landscape from the perspective of risk associated with land use. Categories of risk affecting land use and ranch operation include: i) natural (i.e., impact of weather, climate, flooding and access to resources), ii) financial (i.e., costs of operation affected by inflation, interest rates, supply chains, product marketing); and iii) socio-economic (urban development, legislation, regulation, etc.). Wildlife damage to them is just another risk to their agricultural business that can incrementally affect both short and long-term sustainability of the operation.

Wildlife in general appear to relate to the landscape as habitat without distinction between ownership or land use. From this perspective, wildlife use of a landscape is driven by their need for security, shelter and food. These three factors, while variable in relative importance depending upon immediate circumstances, continuously influence wildlife interactions with habitat. The most optimal habitat will be the mix of land form and vegetation in the landscape that best meets their immediate needs.

There are several landscape-scale issues that cause wildlife to damage private property. These issues include: i) degraded public rangeland and forest habitat, ii) degraded forage quality caused by wildfire, invasive and/or noxious vegetation, iii) barriers that cause lack of habitat connectivity that interrupt or change wildlife movement patterns, and iv) pressure created by large carnivore predators (cougar, bear, wolves) that may be forcing ungulate wildlife to seek security, shelter, and food at critical times on private property.

Forage Quality. In Oregon and other western states, millions of acres of former dryland cereal grain fields have been converted to perennial vegetation to reduce erosion and provide food habitat for wild herbivores and upland game birds (i.e., Conservation Reserve Program). Almost all cropland and most of the lower elevation pastureland was privatized during early settlement. Currently, much of the dryland crop fields are now enrolled and administered in USDA-Farm Services Administration (FSA) conservation programs that tend to restrict or not allow grazing by domestic livestock. Lack of proper grazing by livestock can negatively affect the quality of forage available to wildlife in different seasons.

Barriers to Wildlife Movement. Movement within, and migration through a watershed, is a common attribute of terrestrial wildlife. In Oregon, terrestrial wildlife (especially ungulate wildlife), tend to move along watershed elevational gradients to higher or lower habitat depending on the season. Movements of wildlife through the watershed often force encounters with private property used for crop production, livestock grazing, urban development and transportation corridors.

Habitat Connectivity. Maintaining the functionality of migration routes and the availability of habitat associated with these routes is difficult. Barriers (roadways, fences, human development, etc.) constrain wildlife movement and expose animals to unnecessary risk. Maintaining or restoring habitat connectivity is important to ensuring that migrating wildlife have safe passage through impediments that affect their security, shelter and food needs.

Large Carnivores. A consensus is developing among farmers and ranchers that large carnivore predators influence other wildlife to increasingly use private property. Although unproven, the growing number of resident deer and elk may be caused by large carnivores influencing ungulate wildlife to move to private property, or prevent them from leaving.

3. Oregon Wildlife Damage Program

An Oregon Wildlife Damage Program that addresses both prevention and compensation has the highest potential to resolve the wildlife damage issue. Addressing and resolving these issues will require the formation of coalitions comprising private landowners, state and federal agencies, and other organizations that have a vested interest in resolving the wildlife damage issue.

Both Washington and Wyoming have wildlife damage programs that focus solely on monetary compensation. Washington's compensation program addresses damage only to commercial crops, while Wyoming's program addresses losses to growing or stored crops, damaged land, seed crops, improvements, and forage and livestock, including bees. Wildlife recognized as causing damage that is eligible for compensation include large carnivores, large ungulate wildlife and resident and migratory game birds.

The focus of wildlife damage programs in Colorado, Idaho and Nevada is both prevention and monetary compensation for the damage caused by wildlife. Wildlife recognized as causing damage in these three states are large carnivore predators and large wild ungulates. Resident and migratory game birds are not mentioned.

Oregon's Wolf-Livestock Compensation and Benefit Program is an example of direct monetary compensation for damage caused by wolves (i.e., killing or injuring livestock). The program's short-term prevention component is limited to non-lethal activities such as fladry, Fox Lights, and range-riders, which may only work for a limited time before becoming ineffective in preventing livestock mortalities or injuries. Lethal removal of wolves as a preventive tactic in the program is oriented towards "after the fact" removal of individuals in the pack that are believed to be causing the damage. Although removal will prevent the "specific carnivore" from causing future damage to livestock, it does not prevent other carnivores from causing similar damage to livestock in the immediate or future time frame.

Compensation and Prevention.

Monetary compensation is payment, or reimbursement for damage caused by wildlife to owners of private property. The long-term effectiveness of direct monetary compensation requires that funding be available in an amount sufficient to address the problem as it occurs over time, and at the scale that damage is occurring. Direct monetary compensation alone can mitigate the short-term economic impacts of wildlife damage to private property; it does not resolve the problem, or prevent it from occurring in the future.

Prevention of wildlife damage to private property usually requires addressing landscape-scale issues on both public and private land. The primary landscape-scale issues that need to be addressed are: i) degradation of forest and rangeland habitat, ii) degradation of forage quality, iii) depredation of wild and domestic ungulates by large carnivore predators, and iv) barriers to wild ungulate movements. Addressing these issues at the landscape scale will necessarily require the involvement of federal and state resource management agencies.

Prevention should prevent or significantly reduce the amount of wildlife damage occurring on private property. To do this, prevention should be applied at two different time frames: short term during or immediately following a damage event, and long-term to prevent the event from reoccurring at a future time.

Short-Term Prevention. Short-term prevention address wildlife damage that is on-going (e.g., damage hunts, hazing wildlife from private land, road closures, providing elk panels to protect hay stacks, etc.) Usually, implementation of these preventive measures is by owners of the private property being damaged, or by state wildlife departments (e.g., damage hunts, hazing wildlife away from cropland or pasture, providing panels and/or netting to protect hay stacks from depredating wildlife, etc.).

Long-Term Prevention. Long-Term prevention generally requires longer time-frames and expenditures to complete. This type of prevention includes: i) construction of wildlife-proof fences to protect cropland, ii) development of Wildlife Feeding Stations and Wildlife Management Areas, iii) re-activating closed and vacant federal grazing allotments to improve forage quality and reduce fine fuel loads, iv) wildfire woody fuels reduction and habitat improvement projects, v) noxious weed control programs, etc. Often, wildlife damage prevention is not the initial purpose of the agency implementing the project, but accomplishes the preventive measure as a subsidiary outcome of the actions taken.

5. Establishing a Wildlife Damage Program

Successfully implementing a wildlife damage prevention and compensation program needs to address the multiple interacting factors that include: i) wildlife species creating the damage that will be compensated, ii) what types of damage will be compensated, iii) eligibility of the property owner to qualify for compensation, iv) procedures to implement prevention measures and claim compensation, v) access to long-term compensation funding sources, vi) procedures to determine the amount and value of the wildlife damage, vii) procedures to disburse compensation to the affected private landowner, and viii) formation of coalitions between the diverse stakeholders involved.

Establishing a county wildlife damage program requires the involvement and commitment of various organizations that have a vested interest in finding equitable solutions to the wildlife damage issue. Key stakeholder organizations include: i) the owner(s) or lease holders of private property on which damage is occurring, ii) county, state and federal institutions involved in resource management at the local level, and iii) other organizations that will benefit from or can contribute to resolving the damage issue.

Key State Institutions

State institutions that should be involved in the Wildlife Damage Program include:

Interim House Committee. The Interim House Committee on Agriculture, Land Use, Natural Resources, and Water (HALNW).

Legislators. Senators and Representatives from the district/county in which the Wildlife Damage Program is implemented.

State Wildlife Damage Program Advisory Committee. The Committee will advise and address legislative and implementation issues that affect the Oregon Wildlife Damage Program. The committee should function as an “intermediary” link between the property owner being affected by wildlife damage,

agencies involved in implementation of county wildlife damage programs, and state, federal and NGO organizations that advocate for, or enable, implementation of wildlife damage programs. Membership of the Committee should include representatives from organizations that formed the “Elk and Deer Compensation Workgroup” and others as needed (Attachment).

Oregon Department of Fish and Wildlife (ODFW). The primary function of the ODFW is addressing wildlife damage issues at the county and regional levels. Responsibilities of ODFW also include: i) implementing short-term damage prevention measures, ii) assisting in verification of wildlife damage, and iii) interacting with federal agencies at the county and regional levels to assist long-term prevention activities. ODFW will have membership in the County Wildlife Damage Committee and the State Wildlife Damage Advisory Committee.

Oregon Department of Agriculture (ODA). The primary function of the Oregon Department of Agriculture is the administration and management of prevention and compensation funds allocated by the legislature or from other state and non-state sources. A secondary function of the ODA is distribution of state compensation funds to the county for verified wildlife damage claims. The ODA will be advised of the USDA-APHIS (Wildlife Services) activities that involve the County Wildlife Damage Program.

Oregon Department of Forestry (ODF). The Primary function of ODF will be suppression of wildfire on private property and assisting private landowners to improve wildlife habitat through fuel reduction, timber harvest programs and fire prevention.

Oregon Department of Transportation (ODOT). The primary function of ODOT relative to preventing wildlife damage, is removal of barriers that impede wildlife movement and migration. A major barrier to wildlife movement and migration is transportation corridors (highways, railroads, right-of-way fences, etc.). Many, if not most, transportation corridors are located in valleys that before settlement were spring/fall or winter range for large wild ungulates. Transportation corridors in valleys are closely linked to development activities that also may impede wildlife movements.

Key Federal Institutions

USDA-Forest Service (FS)/USDI-Bureau of Land Management (BLM). The FS and BLM are responsible for implementing landscape-scale wildlife damage preventative measures on federally managed grassland and forest. Both agencies are currently implementing programs that improve habitat and habitat connectivity for wildlife as a secondary benefit, especially for wild ungulate grazers (elk, deer, pronghorn) and livestock. Ongoing habitat programs include:

- Fine and woody fuels reduction projects (thinning and burning programs, fire breaks, domestic livestock grazing) to prevent catastrophic wildfire.
- Opening closed and vacant grazing allotments to allow livestock grazing to reduce fine fuel loads and improve forage quality for livestock and Wildlife.
- Seasonal road closures to prevent vehicle traffic from impeding wildlife movement.

The primary responsibility of the FS and BLM at county and regional levels relative to preventing wildlife damage is habitat improvement. The FS and BLM are currently engaged in woody fuels reduction programs designed to minimize the potential of catastrophic wildfire on forest and rangeland under their jurisdiction. The program involves treatment of woody ground debris and standing woody-ladder fuels that stimulate out-of-control wildfire. Treatments to reduce fuel loads include: i) reducing woody

understory cover with controlled burning, ii) thinning dense stands of lodgepole by cutting, piling and burning, iii) creating firebreaks along primary forest roads by logging trees <21 dbh, and iv) cutting, piling and burning or chipping dense stands of lodgepole. Controlled grazing by livestock on closed or vacant grazing allotments can reduce the volume of herbaceous fine fuels, and will impede the spread and intensity of wildfire on open grass-steppe and forest-steppe rangelands.

USDA-Natural Resources Conservation Service (NRCS). The NRCS provides technical and financial assistance to help landowners improve wildlife habitat on private property. Programs include: i) Conservation Stewardship Program (CSP), ii) Grassland Conservation Reserve Programs (G-CRP), Conservation Reserve Easement Program (CREP), iv) Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP). The NRCS also develops a Conservation Management Plan for the property owner. The cooperating property owner is reimbursed for costs incurred during program implementation.

USDA-APHIS-Wildlife Services (WS). The primary function of Wildlife Services is to resolve wildlife conflicts to allow people and wildlife to co-exist. WS provides technical assistance and direct management operations in response to requests for assistance by property owners. Both lethal and non-lethal techniques are used in resolving conflicts with wildlife, especially with semi-protected large carnivore predators.

Key County Institutions

Soil and Water Conservation District (SWCD). The county Soil and Water Conservation District (SWCD) is an appropriate location for the County Wildlife Damage Program. Reasons include: i) there are 45 County Soil and Water Conservation Districts in the State, ii) Soil and Water Conservation Districts are a program in the Oregon Department of Agriculture, and iii) the Wolf-Livestock Compensation and Benefit Program is administered by the County Soil and Water Conservation District in some counties. Locating the County Wildlife Damage Program in the SWCD as a companion program to the W-LCB can be easily achieved. In counties without a W-LCBP, the procedures required to establish the CWDP at the county SWCD would be similar.

- **Administrative Staffing.** The SWCD in many rural counties have limited staff. In those counties, procuring a part time administrative assistant to manage the CWD program may be necessary. Duties of the administrative assistant will include: i) coordination of a county wildlife damage implementation with other counties and the state, ii) processing and consolidating damage claims, and iii) administrative support.
- **Damage Adjudicator.** A Crop and Structure Damage Adjudicator Program may need to hire a private contractor with knowledge of different crops in the county/region and crop adjudication expertise.
- **Pasture/Forage/Rangeland Damage (PFR) Adjudicator.** Same as a crop adjudicator but with expertise in evaluating damage by wildlife to pasture, forage, hay crops and rangeland.

County Commissioners. Most county governments are led by elected “commissioners” who together preside over various departments and control county finances. Important departments include the Sheriff, Land-use Planning, Roads, Court, etc.

Wildlife Damage Committees

The County Wildlife Damage Committee will be responsible for organizing stakeholders and overseeing the wildlife damage in the county. Members of the committee will include representatives from federal and state resource management agencies located in the county, and county government.

Responsibilities of the committee will include support advice and supervision and application of preventive measures.

The Program Implementation (or Working) Group includes representatives from the County, ODFW, NRCS, Forest Service, BLM, Conservation NGOs and other county-level organizations that are, or should be, stakeholders in resolving wildlife damage issues. The purpose of the implementation committee is determining the what, where, when, and how to compensate landowners and prevent wildlife damage to private property.

6. Establishing Wildlife Damage Prevention and Compensation Pilot Areas

Selection of a limited number of wildlife damage pilots in different regions of the state will allow: i) testing and evaluation of the county wildlife damage concept and structure, ii) formation of local level coalitions needed to implement prevention measures and iii) evaluation of regional differences and needs in the state. Trial counties would be selected from the major eco-regions/watersheds of the state (<https://arcg.is/1Submb0>).

Effectiveness of the wildlife damage pilots will be evaluated by the State Wildlife Damage Advisory Committee and the County Wildlife Damage Committee. Both Committees can recommend necessary changes or improvements to the County Wildlife Damage Program. If the form and function of the county approach is evaluated as effective in both western and eastern Oregon, the program will be implemented as a state wide program in counties experiencing substantial wildlife damage.

The pilot program will allow integration of state agency programs (e.g., ODFW Migration Corridors and Habitat Connectivity, etc.), federal agency programs (e.g., Forest Service Fine and Woody Fuels Reduction Program , NRCS Conservation Stewardship Program/Grassland Conservation Reserve Program, etc.) and the development of new venues of compensation funding to address wildlife damage (e.g., Risk Management Agency Insurance Programs, Private Insurance Programs, etc.).

Wildlife Damage Areas.

Establishing County Wildlife Damage Areas (WDA) enables private property owners, state and federal resource and wildlife management agencies to develop and apply effective prevention and compensation measures to alleviate wildlife damage. The number of WDA established in each county will be dependent upon: i) size and diversity of the county, ii) extent of wildlife damage, and iii) diversity of habitat and agriculture crops in the county. The number of counties in a WDA depends on movement patterns of the wildlife involved in damage

Selection of WDA. The WDA will comprise one or more Wildlife Management Units (WMU) which are the geographical and administrative units employed by ODFW to manage wildlife. Wildlife Management Units also often coincide with Conservation Opportunity Areas (COA). The WDA pilots would address “hotspot areas” of chronic and/or escalating wildlife damage.

The criteria for selection of Wildlife Damage Pilot Areas includes.

- high and expanding numbers of large predators,
- forests that have been extensively logged in the past which are now showing extensive growth of woody shrubs and small trees,
- public land forest and grassland habitats that are no longer grazed by livestock and are becoming increasingly susceptible to wildfire,
- public and private land holdings represented across the landscape,
- cropland used primarily to produce specialty crops, irrigated pasture, cereal grains, and hay (including alfalfa), and
- a large and growing wildlife damage problem.

Assessing Wildlife Damage. Successfully implementing a compensation and prevention program to mitigate wildlife damage must address multiple interacting factors including: i) wildlife species creating the damage that will be compensated, ii) what types of damage will be compensated, iii) eligibility of the landowner/land user to qualify for compensation, iv) procedures for claiming compensation, v) accessing long-term funding sources, vi) procedures to determine the amount and value of the damage and vii) procedures to disburse compensation to the affected private landowner viii) procedures to disburse funds to implement habitat improvement projects.

Compensation for damage caused by wildlife can be assessed on a “damage done” or a “damage from take” basis. Relative to elk and other wild ungulates, both methods, depending on specific damage circumstances, can be used.

Damage Done. The damage done basis of assessing wildlife caused damage is most applicable to crops and cropland, facilities, and fixtures. For cropland, the primary damage occurs from the reduction in productivity caused by animal consumption of the crop, trampling of the crop, and soil impaction. Damage to fixed assets such as fences, irrigation equipment, etc. can be assessed at each event, with compensation determined by cost of repair and time involved. If the wildlife damage is reoccurring, such as daily or weekly visits by elk to a hayfield, the initial three procedural steps should be followed for each event. At the end of the season (for crops), an assessment of crop productivity would be made by the assessment team to determine the amount of loss, and the value of the loss.

Damage Take. Determining compensation on a damage take basis is especially useful for evaluating wild ungulate forage consumption at landscape scales (i.e., pasture and rangeland). At that scale, damage compensation would be based on the amount of forage consumed by ungulate wildlife for the duration of the time the animals were on the private land, with compensation based on the value of the forage consumed. The procedure to determine forage take and compensation value is similar to the process used to determine the value of forage consumed by domestic livestock.

The County Wildlife Damage Program can obtain this information through direct observation or remote observation (i.e., fixed-wing aircraft, drones, trail cameras, and phone cameras) to monitor wildlife use of privately owned land (i.e., facilities, cropland, rangeland, etc.). Information acquired by the different techniques can be integrated to determine the type and extent of depredation, and a compensation value.

Landscape Scale Monitoring. Fixed-wing or rotor wing aircraft can be used to monitor seasonal wildlife use on private and public property. Periodic flights along permanent transects can be used to obtain an estimate of seasonal wildlife use, whether wild or domestic ungulate or large carnivores. During each flight occurring at time intervals, the location and number of targeted wildlife along the transect can be recorded and evaluated. Transects could be flown at defined intervals (subject to weather conditions) during winter, spring/fall and summer seasons.

Property Owner Observations. Observations by cooperating property owners could be obtained by: i) using phone cameras to record short videos of elk damage done to structures, facilities, and crops, ii) trail cameras placed along elk travel routes from rangeland to cropland can be used to obtain wildlife numbers and time and duration of the damage event, and iii) periodic aircraft and/or drones flights on private land to establish wildlife numbers and location relative to facilities, structures and crops.

Cropland Scale Monitoring. The procedure to assess the amount of damage and calculate compensation value is: i) obtain photos and/or videos to assess site damage and animals causing damage, ii) record location, date, habitat type, kind and number of ungulates; iii) submit evidence to the damage assessment team (i.e., insurance agency, wildlife damage agent, etc., and iv) request site visit by the crop adjudicator to determine value of the damage for compensation.

If the wildlife damage is reoccurring on a daily or weekly basis, the initial three procedural steps should be followed for each event. At the end of each season, an assessment of total damage could be made by the assessment team to determine the total amount and value of the loss. The information collected by the different methods will be consolidated in damage files established for each cooperating land-owner by the project Soil and Water Conservation District.

7. Compensation Funding Models

Different compensation models include:

- Legislative Model. The current “Wolf-Livestock Compensation and Benefit Program” is an example of a legislated compensation model (Attached).
- PFR Model. The Pasture-Forage-Range Program developed by the Federal Risk Management Agency is an example of a federal-private insurance program administered by private insurance providers and subsidized by the federal government.
- The attached model (i.e. Wildlife Damage- Group Risk Insurance Program (GRIP)), if implemented, would be a State-Private Insurance Provider-Property Owner model. In this model, the state contracts with a private insurance company to provide wildlife damage insurance to property owners. (Attachment A).

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While wildlife depredation can affect all property owners, it is ranchers and farmers that are becoming increasingly susceptible to damage caused by wildlife. Wildlife responsible for most current damage to private property includes:

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Wildlife caused damage to private property is a statewide issue. While the damage to private property is not directly the fault of the wildlife or the state, the state has legal and management responsibility for most wildlife. Consequently, damage to private property by wildlife should be addressed by the state. .

Owners of private property, especially farmers and ranchers, want to find equitable solutions to the problem of wildlife damage to private property. Currently, wild ungulates (elk and deer) are the primary huntable wild ungulates in Oregon, and the primary prey species for large carnivore predators. Ranchers with livestock also recognize that a significant decline in wild ungulate numbers will increase large carnivore predation of livestock as livestock become the primary prey species for all predators.

There is a developing consensus among owners of private property that poor condition of public land habitat is a major factor influencing wildlife, especially large ungulate wildlife, to seek out habitat on private property. Changes to public land rangeland and forested habitat on public land that contribute to wildlife use and potential damage of private property include: i) poor structural characteristics of forested habitat on public lands provides less security and shelter for wild and domestic ungulates, ii) lack of managed timber harvest to create openings in the forest canopy to promote growth of herbaceous forage, iii) inadequate "backgrounding" of forage by domestic ungulates to improve

nutritional content of forage for large wild ungulates and reduce herbaceous fuel loads, and iv) increasing dominance of both public and private rangeland and forest habitat by invasive and weedy vegetation.

2. Causes of Wildlife Damage.

A successful Wildlife Damage Prevention and Compensation Program requires knowledge and understanding of the reasons that damage is occurring, the places it will probably occur, and the time at which it will occur. Fundamental to this understanding is the recognition that Oregon's landscape is comprised primarily of watersheds. This landscape pattern repeats itself throughout the state, ranging from large river drainages to small stream tributaries. Within the general pattern of watersheds, topography has a similar land form consisting of valleys, adjacent lower elevation hill-land terrain, and higher elevation mountainous terrain. As a result of this typical topographic pattern, valleys and lower elevations are the location of most privately owned land and the site of associated developments. In contrast to lowlands, uplands are less developed, and tend to be public lands managed by public agencies.

Landscape Characteristics.

The physical attributes (i.e., land-form, topography, elevational gradients, water sources, vegetation, etc.) of a watershed, or any part of the watershed, are a major determinant of land use, and the purpose for which the land is used. Intensive crop agriculture (i.e., specialty crops, hay and grain, irrigated pasture, etc.) is generally associated with lower elevation valleys of watersheds due to the availability of fertile soils and water for irrigation. Lower elevations are also the location of most transportation corridors, farms and ranches, industrial sites, and cities and towns. Lower elevation hill-lands connected to valleys were previously used primarily for livestock grazing and/or dryland crop production. While still used primarily for livestock grazing, most of the former dryland crop ground is no longer farmed unless underground aquifers provide water for irrigation. Naturally wet or irrigated pastures associated with cropland are important sources of feed for wild and domestic animals.

Prior to settlement and extensive development, valleys and lower to middle elevation cropland and pastures were important spring/fall or winter habitat for wild ungulates, migratory waterfowl and resident game birds. Middle and higher elevations of watersheds are typically grassland and forest habitat used to graze livestock, harvest timber for wood products, hunting and recreation. Higher elevation grassland, forest and alpine was, and still is, important summer habitat for wild ungulates, game birds and other wildlife.

Over 51 % of the land area of Oregon is public land managed by the federal government agencies. Public land use was oriented towards grazing by domestic ungulates, timber harvest, mining, hunting, and recreational activities. Although large tracts of privately owned forest and rangeland exist in Oregon, the majority of higher elevation rangeland and forest grazed by wild and domestic ungulates is public land managed by the Bureau of Land Management or the Forest Service. Currently, recreational use is becoming the most important use. On both private and public rangeland, livestock are generally extensively managed, and have grazing behavior similar to wild ungulates.

Landscape-Scale Issues

Most property owners engaged in crop agriculture and/or livestock production relate to the landscape from the perspective of risk associated with land use. Categories of risk affecting land use and ranch operation include: i) natural (i.e., impact of weather, climate, flooding and access to resources), ii) financial (i.e., costs of operation affected by inflation, interest rates, supply chains, product marketing); and iii) socio-economic (urban development, legislation, regulation, etc.). Wildlife damage to them is just another risk to their agricultural business that can incrementally affect both short and long-term sustainability of the operation.

Wildlife in general appear to relate to the landscape as habitat without distinction between ownership or land use. From this perspective, wildlife use of a landscape is driven by their need for security, shelter and food. These three factors, while variable in relative importance depending upon immediate circumstances, continuously influence wildlife interactions with habitat. The most optimal habitat will be the mix of land form and vegetation in the landscape that best meets their immediate needs.

There are several landscape-scale issues that cause wildlife to damage private property. These issues include: i) degraded public rangeland and forest habitat, ii) degraded forage quality caused by wildfire, invasive and/or noxious vegetation, iii) barriers that cause lack of habitat connectivity that interrupt or change wildlife movement patterns, and iv) pressure created by large carnivore predators (cougar, bear, wolves) that may be forcing ungulate wildlife to seek security, shelter, and food at critical times on private property.

Forage Quality. In Oregon and other western states, millions of acres of former dryland cereal grain fields have been converted to perennial vegetation to reduce erosion and provide food habitat for wild herbivores and upland game birds (i.e., Conservation Reserve Program). Almost all cropland and most of the lower elevation pastureland was privatized during early settlement. Currently, much of the dryland crop fields are now enrolled and administered in USDA-Farm Services Administration (FSA) conservation programs that tend to restrict or not allow grazing by domestic livestock. Lack of proper grazing by livestock can negatively affect the quality of forage available to wildlife in different seasons.

Barriers to Wildlife Movement. Movement within, and migration through a watershed, is a common attribute of terrestrial wildlife. In Oregon, terrestrial wildlife (especially ungulate wildlife), tend to move along watershed elevational gradients to higher or lower habitat depending on the season. Movements of wildlife through the watershed often force encounters with private property used for crop production, livestock grazing, urban development and transportation corridors.

Habitat Connectivity. Maintaining the functionality of migration routes and the availability of habitat associated with these routes is difficult. Barriers (roadways, fences, human development, etc.) constrain wildlife movement and expose animals to unnecessary risk. Maintaining or restoring habitat connectivity is important to ensuring that migrating wildlife have safe passage through impediments that affect their security, shelter and food needs.

Large Carnivores. A consensus is developing among farmers and ranchers that large carnivore predators influence other wildlife to increasingly use private property. Although unproven, the growing number of resident deer and elk may be caused by large carnivores influencing ungulate wildlife to move to private property, or prevent them from leaving.

3. Oregon Wildlife Damage Program

An Oregon Wildlife Damage Program that addresses both prevention and compensation has the highest potential to resolve the wildlife damage issue. Addressing and resolving these issues will require the formation of coalitions comprising private landowners, state and federal agencies, and other organizations that have a vested interest in resolving the wildlife damage issue.

Both Washington and Wyoming have wildlife damage programs that focus solely on monetary compensation. Washington's compensation program addresses damage only to commercial crops, while Wyoming's program addresses losses to growing or stored crops, damaged land, seed crops, improvements, and forage and livestock, including bees. Wildlife recognized as causing damage that is eligible for compensation include large carnivores, large ungulate wildlife and resident and migratory game birds.

The focus of wildlife damage programs in Colorado, Idaho and Nevada is both prevention and monetary compensation for the damage caused by wildlife. Wildlife recognized as causing damage in these three states are large carnivore predators and large wild ungulates. Resident and migratory game birds are not mentioned.

Oregon's Wolf-Livestock Compensation and Benefit Program is an example of direct monetary compensation for damage caused by wolves (i.e., killing or injuring livestock). The program's short-term prevention component is limited to non-lethal activities such as fladry, Fox Lights, and range-riders, which may only work for a limited time before becoming ineffective in preventing livestock mortalities or injuries. Lethal removal of wolves as a preventive tactic in the program is oriented towards "after the fact" removal of individuals in the pack that are believed to be causing the damage. Although removal will prevent the "specific carnivore" from causing future damage to livestock, it does not prevent other carnivores from causing similar damage to livestock in the immediate or future time frame.

Compensation and Prevention.

Monetary compensation is payment, or reimbursement for damage caused by wildlife to owners of private property. The long-term effectiveness of direct monetary compensation requires that funding be available in an amount sufficient to address the problem as it occurs over time, and at the scale that damage is occurring. Direct monetary compensation alone can mitigate the short-term economic impacts of wildlife damage to private property; it does not resolve the problem, or prevent it from occurring in the future.

Prevention of wildlife damage to private property usually requires addressing landscape-scale issues on both public and private land. The primary landscape-scale issues that need to be addressed are: i) degradation of forest and rangeland habitat, ii) degradation of forage quality, iii) depredation of wild and domestic ungulates by large carnivore predators, and iv) barriers to wild ungulate movements. Addressing these issues at the landscape scale will necessarily require the involvement of federal and state resource management agencies.

Prevention should prevent or significantly reduce the amount of wildlife damage occurring on private property. To do this, prevention should be applied at two different time frames: short term during or immediately following a damage event, and long-term to prevent the event from reoccurring at a future time.

Short-Term Prevention. Short-term prevention address wildlife damage that is on-going (e.g., damage hunts, hazing wildlife from private land, road closures, providing elk panels to protect hay stacks, etc.) Usually, implementation of these preventive measures is by owners of the private property being damaged, or by state wildlife departments (e.g., damage hunts, hazing wildlife away from cropland or pasture, providing panels and/or netting to protect hay stacks from depredating wildlife, etc.).

Long-Term Prevention. Long-Term prevention generally requires longer time-frames and expenditures to complete. This type of prevention includes: i) construction of wildlife-proof fences to protect cropland, ii) development of Wildlife Feeding Stations and Wildlife Management Areas, iii) re-activating closed and vacant federal grazing allotments to improve forage quality and reduce fine fuel loads, iv) wildfire woody fuels reduction and habitat improvement projects, v) noxious weed control programs, etc. Often, wildlife damage prevention is not the initial purpose of the agency implementing the project, but accomplishes the preventive measure as a subsidiary outcome of the actions taken.

5. Establishing a Wildlife Damage Program

Successfully implementing a wildlife damage prevention and compensation program needs to address the multiple interacting factors that include: i) wildlife species creating the damage that will be compensated, ii) what types of damage will be compensated, iii) eligibility of the property owner to qualify for compensation, iv) procedures to implement prevention measures and claim compensation, v) access to long-term compensation funding sources, vi) procedures to determine the amount and value of the wildlife damage, vii) procedures to disburse compensation to the affected private landowner, and viii) formation of coalitions between the diverse stakeholders involved.

Establishing a county wildlife damage program requires the involvement and commitment of various organizations that have a vested interest in finding equitable solutions to the wildlife damage issue. Key stakeholder organizations include: i) the owner(s) or lease holders of private property on which damage is occurring, ii) county, state and federal institutions involved in resource management at the local level, and iii) other organizations that will benefit from or can contribute to resolving the damage issue.

Key State Institutions

State institutions that should be involved in the Wildlife Damage Program include:

Interim House Committee. The Interim House Committee on Agriculture, Land Use, Natural Resources, and Water (HALNW).

Legislators. Senators and Representatives from the district/county in which the Wildlife Damage Program is implemented.

State Wildlife Damage Program Advisory Committee. The Committee will advise and address legislative and implementation issues that affect the Oregon Wildlife Damage Program. The committee should function as an “intermediary” link between the property owner being affected by wildlife damage,

agencies involved in implementation of county wildlife damage programs, and state, federal and NGO organizations that advocate for, or enable, implementation of wildlife damage programs. Membership of the Committee should include representatives from organizations that formed the “Elk and Deer Compensation Workgroup” and others as needed (Attachment).

Oregon Department of Fish and Wildlife (ODFW). The primary function of the ODFW is addressing wildlife damage issues at the county and regional levels. Responsibilities of ODFW also include: i) implementing short-term damage prevention measures, ii) assisting in verification of wildlife damage, and iii) interacting with federal agencies at the county and regional levels to assist long-term prevention activities. ODFW will have membership in the County Wildlife Damage Committee and the State Wildlife Damage Advisory Committee.

Oregon Department of Agriculture (ODA). The primary function of the Oregon Department of Agriculture is the administration and management of prevention and compensation funds allocated by the legislature or from other state and non-state sources. A secondary function of the ODA is distribution of state compensation funds to the county for verified wildlife damage claims. The ODA will be advised of the USDA-APHIS (Wildlife Services) activities that involve the County Wildlife Damage Program.

Oregon Department of Forestry (ODF). The Primary function of ODF will be suppression of wildfire on private property and assisting private landowners to improve wildlife habitat through fuel reduction, timber harvest programs and fire prevention.

Oregon Department of Transportation (ODOT). The primary function of ODOT relative to preventing wildlife damage, is removal of barriers that impede wildlife movement and migration. A major barrier to wildlife movement and migration is transportation corridors (highways, railroads, right-of-way fences, etc.). Many, if not most, transportation corridors are located in valleys that before settlement were spring/fall or winter range for large wild ungulates. Transportation corridors in valleys are closely linked to development activities that also may impede wildlife movements.

Key Federal Institutions

USDA-Forest Service (FS)/USDI-Bureau of Land Management (BLM). The FS and BLM are responsible for implementing landscape-scale wildlife damage preventative measures on federally managed grassland and forest. Both agencies are currently implementing programs that improve habitat and habitat connectivity for wildlife as a secondary benefit, especially for wild ungulate grazers (elk, deer, pronghorn) and livestock. Ongoing habitat programs include:

- Fine and woody fuels reduction projects (thinning and burning programs, fire breaks, domestic livestock grazing) to prevent catastrophic wildfire.
- Opening closed and vacant grazing allotments to allow livestock grazing to reduce fine fuel loads and improve forage quality for livestock and Wildlife.
- Seasonal road closures to prevent vehicle traffic from impeding wildlife movement.

The primary responsibility of the FS and BLM at county and regional levels relative to preventing wildlife damage is habitat improvement. The FS and BLM are currently engaged in woody fuels reduction programs designed to minimize the potential of catastrophic wildfire on forest and rangeland under their jurisdiction. The program involves treatment of woody ground debris and standing woody-ladder fuels that stimulate out-of-control wildfire. Treatments to reduce fuel loads include: i) reducing woody

understory cover with controlled burning, ii) thinning dense stands of lodgepole by cutting, piling and burning, iii) creating firebreaks along primary forest roads by logging trees <21 dbh, and iv) cutting, piling and burning or chipping dense stands of lodgepole. Controlled grazing by livestock on closed or vacant grazing allotments can reduce the volume of herbaceous fine fuels, and will impede the spread and intensity of wildfire on open grass-steppe and forest-steppe rangelands.

USDA-Natural Resources Conservation Service (NRCS). The NRCS provides technical and financial assistance to help landowners improve wildlife habitat on private property. Programs include: i) Conservation Stewardship Program (CSP), ii) Grassland Conservation Reserve Programs (G-CRP), Conservation Reserve Easement Program (CREP), iv) Conservation Reserve Program (CRP), Environmental Quality Incentive Program (EQIP). The NRCS also develops a Conservation Management Plan for the property owner. The cooperating property owner is reimbursed for costs incurred during program implementation.

USDA-APHIS-Wildlife Services (WS). The primary function of Wildlife Services is to resolve wildlife conflicts to allow people and wildlife to co-exist. WS provides technical assistance and direct management operations in response to requests for assistance by property owners. Both lethal and non-lethal techniques are used in resolving conflicts with wildlife, especially with semi-protected large carnivore predators.

Key County Institutions

Soil and Water Conservation District (SWCD). The county Soil and Water Conservation District (SWCD) is an appropriate location for the County Wildlife Damage Program. Reasons include: i) there are 45 County Soil and Water Conservation Districts in the State, ii) Soil and Water Conservation Districts are a program in the Oregon Department of Agriculture, and iii) the Wolf-Livestock Compensation and Benefit Program is administered by the County Soil and Water Conservation District in some counties. Locating the County Wildlife Damage Program in the SWCD as a companion program to the W-LCB can be easily achieved. In counties without a W-LCBP, the procedures required to establish the CWDP at the county SWCD would be similar.

- **Administrative Staffing.** The SWCD in many rural counties have limited staff. In those counties, procuring a part time administrative assistant to manage the CWD program may be necessary. Duties of the administrative assistant will include: i) coordination of a county wildlife damage implementation with other counties and the state, ii) processing and consolidating damage claims, and iii) administrative support.
- **Damage Adjudicator.** A Crop and Structure Damage Adjudicator Program may need to hire a private contractor with knowledge of different crops in the county/region and crop adjudication expertise.
- **Pasture/Forage/Rangeland Damage (PFR) Adjudicator.** Same as a crop adjudicator but with expertise in evaluating damage by wildlife to pasture, forage, hay crops and rangeland.

County Commissioners. Most county governments are led by elected “commissioners” who together preside over various departments and control county finances. Important departments include the Sheriff, Land-use Planning, Roads, Court, etc.

Wildlife Damage Committees

The County Wildlife Damage Committee will be responsible for organizing stakeholders and overseeing the wildlife damage in the county. Members of the committee will include representatives from federal and state resource management agencies located in the county, and county government.

Responsibilities of the committee will include support advice and supervision and application of preventive measures.

The Program Implementation (or Working) Group includes representatives from the County, ODFW, NRCS, Forest Service, BLM, Conservation NGOs and other county-level organizations that are, or should be, stakeholders in resolving wildlife damage issues. The purpose of the implementation committee is determining the what, where, when, and how to compensate landowners and prevent wildlife damage to private property.

6. Establishing Wildlife Damage Prevention and Compensation Pilot Areas

Selection of a limited number of wildlife damage pilots in different regions of the state will allow: i) testing and evaluation of the county wildlife damage concept and structure, ii) formation of local level coalitions needed to implement prevention measures and iii) evaluation of regional differences and needs in the state. Trial counties would be selected from the major eco-regions/watersheds of the state (<https://arcg.is/1Submb0>).

Effectiveness of the wildlife damage pilots will be evaluated by the State Wildlife Damage Advisory Committee and the County Wildlife Damage Committee. Both Committees can recommend necessary changes or improvements to the County Wildlife Damage Program. If the form and function of the county approach is evaluated as effective in both western and eastern Oregon, the program will be implemented as a state wide program in counties experiencing substantial wildlife damage.

The pilot program will allow integration of state agency programs (e.g., ODFW Migration Corridors and Habitat Connectivity, etc.), federal agency programs (e.g., Forest Service Fine and Woody Fuels Reduction Program , NRCS Conservation Stewardship Program/Grassland Conservation Reserve Program, etc.) and the development of new venues of compensation funding to address wildlife damage (e.g., Risk Management Agency Insurance Programs, Private Insurance Programs, etc.).

Wildlife Damage Areas.

Establishing County Wildlife Damage Areas (WDA) enables private property owners, state and federal resource and wildlife management agencies to develop and apply effective prevention and compensation measures to alleviate wildlife damage. The number of WDA established in each county will be dependent upon: i) size and diversity of the county, ii) extent of wildlife damage, and iii) diversity of habitat and agriculture crops in the county. The number of counties in a WDA depends on movement patterns of the wildlife involved in damage

Selection of WDA. The WDA will comprise one or more Wildlife Management Units (WMU) which are the geographical and administrative units employed by ODFW to manage wildlife. Wildlife Management Units also often coincide with Conservation Opportunity Areas (COA). The WDA pilots would address “hotspot areas” of chronic and/or escalating wildlife damage.

The criteria for selection of Wildlife Damage Pilot Areas includes.

- high and expanding numbers of large predators,
- forests that have been extensively logged in the past which are now showing extensive growth of woody shrubs and small trees,
- public land forest and grassland habitats that are no longer grazed by livestock and are becoming increasingly susceptible to wildfire,
- public and private land holdings represented across the landscape,
- cropland used primarily to produce specialty crops, irrigated pasture, cereal grains, and hay (including alfalfa), and
- a large and growing wildlife damage problem.

Assessing Wildlife Damage. Successfully implementing a compensation and prevention program to mitigate wildlife damage must address multiple interacting factors including: i) wildlife species creating the damage that will be compensated, ii) what types of damage will be compensated, iii) eligibility of the landowner/land user to qualify for compensation, iv) procedures for claiming compensation, v) accessing long-term funding sources, vi) procedures to determine the amount and value of the damage and vii) procedures to disburse compensation to the affected private landowner viii) procedures to disburse funds to implement habitat improvement projects.

Compensation for damage caused by wildlife can be assessed on a “damage done” or a “damage from take” basis. Relative to elk and other wild ungulates, both methods, depending on specific damage circumstances, can be used.

Damage Done. The damage done basis of assessing wildlife caused damage is most applicable to crops and cropland, facilities, and fixtures. For cropland, the primary damage occurs from the reduction in productivity caused by animal consumption of the crop, trampling of the crop, and soil impaction. Damage to fixed assets such as fences, irrigation equipment, etc. can be assessed at each event, with compensation determined by cost of repair and time involved. If the wildlife damage is reoccurring, such as daily or weekly visits by elk to a hayfield, the initial three procedural steps should be followed for each event. At the end of the season (for crops), an assessment of crop productivity would be made by the assessment team to determine the amount of loss, and the value of the loss.

Damage Take. Determining compensation on a damage take basis is especially useful for evaluating wild ungulate forage consumption at landscape scales (i.e., pasture and rangeland). At that scale, damage compensation would be based on the amount of forage consumed by ungulate wildlife for the duration of the time the animals were on the private land, with compensation based on the value of the forage consumed. The procedure to determine forage take and compensation value is similar to the process used to determine the value of forage consumed by domestic livestock.

The County Wildlife Damage Program can obtain this information through direct observation or remote observation (i.e., fixed-wing aircraft, drones, trail cameras, and phone cameras) to monitor wildlife use of privately owned land (i.e., facilities, cropland, rangeland, etc.). Information acquired by the different techniques can be integrated to determine the type and extent of depredation, and a compensation value.

Landscape Scale Monitoring. Fixed-wing or rotor wing aircraft can be used to monitor seasonal wildlife use on private and public property. Periodic flights along permanent transects can be used to obtain an estimate of seasonal wildlife use, whether wild or domestic ungulate or large carnivores. During each flight occurring at time intervals, the location and number of targeted wildlife along the transect can be recorded and evaluated. Transects could be flown at defined intervals (subject to weather conditions) during winter, spring/fall and summer seasons.

Property Owner Observations. Observations by cooperating property owners could be obtained by: i) using phone cameras to record short videos of elk damage done to structures, facilities, and crops, ii) trail cameras placed along elk travel routes from rangeland to cropland can be used to obtain wildlife numbers and time and duration of the damage event, and iii) periodic aircraft and/or drones flights on private land to establish wildlife numbers and location relative to facilities, structures and crops.

Cropland Scale Monitoring. The procedure to assess the amount of damage and calculate compensation value is: i) obtain photos and/or videos to assess site damage and animals causing damage, ii) record location, date, habitat type, kind and number of ungulates; iii) submit evidence to the damage assessment team (i.e., insurance agency, wildlife damage agent, etc., and iv) request site visit by the crop adjudicator to determine value of the damage for compensation.

If the wildlife damage is reoccurring on a daily or weekly basis, the initial three procedural steps should be followed for each event. At the end of each season, an assessment of total damage could be made by the assessment team to determine the total amount and value of the loss. The information collected by the different methods will be consolidated in damage files established for each cooperating land-owner by the project Soil and Water Conservation District.

7. Compensation Funding Models

Different compensation models include:

- Legislative Model. The current “Wolf-Livestock Compensation and Benefit Program” is an example of a legislated compensation model (Attached).
- PFR Model. The Pasture-Forage-Range Program developed by the Federal Risk Management Agency is an example of a federal-private insurance program administered by private insurance providers and subsidized by the federal government.
- The attached model (i.e. Wildlife Damage- Group Risk Insurance Program (GRIP)), if implemented, would be a State-Private Insurance Provider-Property Owner model. In this model, the state contracts with a private insurance company to provide wildlife damage insurance to property owners. (Attachment A).



Marion Soil and Water Conservation District Natural Resources Committee Meeting – Agenda Item Brief

Agenda Item Name: Help Facilitate City of Salem Planning Commissions Meetings

Date: 04-16-2025

Agenda Item Brief:

The city of Salem is implementing a new flood plain management plan and as part of the process the city and its planning commission will be conducting multiple meetings. The planning commission has reached out to the District asking if we would be able to help facilitate the meetings.

Requested Action:

Discuss

Proposed By: Natural Resources Committee



City of Salem Floodplain Species Assessment

January 2025

ABSTRACT

This Floodplain Species Assessment identifies listed species and their floodplain habitats within the City of Salem urban growth boundary. The Assessment helps to provide credit under the Community Rating System of the National Flood Insurance Program.

Prepared by



**Glenn - Gibson
Watershed Council**

Prepared for

CITY OF Salem
AT YOUR SERVICE
Public Works Department
APWA ACCREDITED AGENCY

Table of Contents

Introduction	3
Floods and Floodplains in Salem	3
Floods and Floodplains as a River Feature	6
The Ecology of Salem Area Floodplains	7
Floodplain Regulation and Regulatory Boundaries	8
Salem’s Floodplain Management Plan	10
Salem Floodplains and their Watersheds	10
Willamette River	11
Mill Creek	12
Glenn Creek	12
Claggett Creek	12
Pringle Creek	12
Smaller Tributaries	12
Floodplain Development	13
Current Floodplain Conditions	16
Floodplain Species	18
Threatened and Endangered Species	18
Range and Critical Habitat Salmon and Steelhead	19
Essential Fish Habitat, under the Magnuson-Stevens Fishery Conservation and Management Act	21
Oregon Essential Indigenous Anadromous Salmonid Habitat	21
Range, Habitat and Recovery Plan for Streaked Horned Lark	24
Range, Habitat and Recovery Plan for Willamette Prairie Species	24
Bald and Golden Eagle Protection Act of 1940	25
Floodplain Habitats and Associated Species	26
Riparian Forest and Shrubland	26
Ponds	26
Wetlands	26
Prairies	26
Creeks and Streams	26
Species of Concern	27
Community Rating System Credit for Conservation and Recovery	29

References	31
Appendix A: Species Profiles	35
Upper Willamette River Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	35
Description	35
Life cycle	35
Habitat	36
Threats	36
ESA Listing Status	36
Critical Habitat	36
Protective Regulations	36
Recovery Plan	36
Habitat use in Salem Area	36
Upper Willamette River Steelhead (<i>Oncorhynchus mykiss</i>)	37
Description	37
Life Cycle	37
Habitat	37
Threats	37
ESA Listing Status	38
Critical Habitat	38
Protective Regulations	38
Recovery Plan	38
Habitat use in Salem Area	38
Streaked Horned Lark (<i>Eremophila alpestris strigata</i>)	39
Description	39
Life Cycle	39
Habitat	39
Threats	39
ESA Listing Status	40
Critical Habitat	40
Recovery Plan	40
Habitat use in Salem Area	40
Northwestern Pond Turtle (<i>Actinemys marmorata</i>)	41
Willamette daisy (<i>Erigeron decumbens</i>)	43
Peacock larkspur (<i>Delphinium pavonaceum</i>)	47

Introduction

The Glenn Gibson Creeks Watershed Council in cooperation with the City of Salem has developed this information on the floodplains and threatened, endangered and other species of concern that inhabit the floodplain environment within the urban growth boundary of Salem. An assessment of floodplain species and a plan of action based on that assessment are credited under the Community Rating System (CRS) of the National Flood Insurance Program (NFIP) to encourage and recognize community actions to protect species listed pursuant to the Endangered Species Act. Providing protection to critical habitat and habitat in general and help those listed and sensitive species recover can be accomplished by knowing what species use what aspects of Salem's floodplains. This "floodplain species assessment" is the first step. It starts the process of learning which species are listed or proposed for listing by the National Marine Fisheries Service and U.S. Fish and Wildlife Service (Services) and which associated critical habitats may be present in the floodways and floodplains in Salem. While the Services have independent authority under the Endangered Species Act, providing information and advice to private and public landowners of floodplain properties can help to avoid regulatory actions or allow for consideration of alternative approaches to the use of such properties.

Figure 1 shows the Study Area with City Limits (dashed line) Urban Growth Boundary (solid black line) Floodway (dark blue) and Floodplain (light blue).

Floods and Floodplains in Salem

Floodplains are the dynamic and diverse areas adjacent to rivers and streams that are inundated during high water periods but may not be underwater during Oregon's dry summer conditions. They are often low-lying areas adjacent to a stream or river channel and can vary in width from a narrow fringe to extensive and expansive reaches, depending on the landform constraints and stream gradient. Historically, floodplains in the Salem area were complex and had a natural ability to absorb and diminish floods. Streams and rivers often had a complex of small side channels that changed and rearranged seasonally. Salmon and other fish and aquatic animals used these side channels as refugia during high water periods and native fish such as cutthroat trout were abundant in the tributary streams. Beaver ponds were abundant and created wetlands for a diversity of fish, reptiles, amphibians, and waterfowl. In addition, wetlands fed by groundwater and springs provided rich soil nutrients and cool, clean water to the streams and rivers.

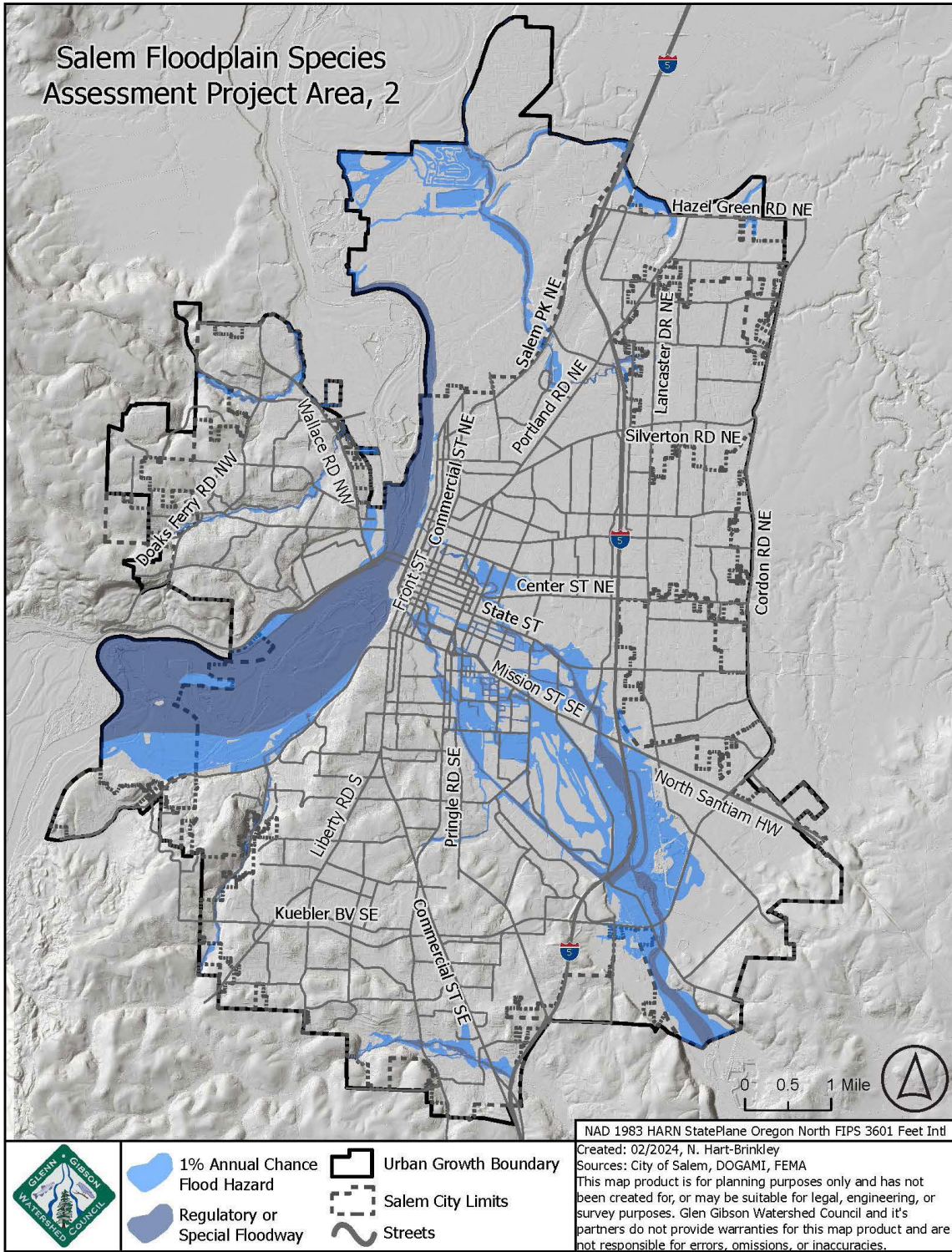


Figure 1: Salem Floodplain Species Assessment Study Area



Figure 2: Flooding in Downtown Salem 1964

Over the last nearly two centuries the floodplains of Salem’s waterways have been extensively altered. Modification of the Willamette River and its floodplain has been well documented in the Willamette River Planning Atlas (Hulse et al., 2003). The modification of tributary streams and their floodplains is less well documented. Development along the edges of our rivers, streams, and sloughs has eliminated or greatly reduced floodplain area and thus the ability of our floodplains to absorb, retain, and slow floodwaters. In addition, floodplains have been stripped of their native vegetation, drained for agriculture, filled to accommodate development, and covered by pavement for transportation. Increasing stormwater runoff from impervious areas, and the loss of available storage in the floodplain cause more frequent and larger floods.

Floods and Floodplains as a River Feature

While rivers and creeks are often viewed as only the summer flowing areas of water through a channel at the bottom of a valley, the amount of stream flow and thus the area of the valley floor interacting with the stream varies in time. It is easy to recognize the area that is regularly inundated by higher flows by their low-lying topography and vegetation adapted to frequent inundation. The area of the valley floor that is less frequently inundated remains a part of the river and can be an active part of the river providing significant ecological functions (*Figure 3* taken from Wohl, 2021). The regularly active channel reflects the low flow and high velocity area of the river. The river interacts with the floodplain during less frequent but regular higher flows. The river also interacts with the sediments of the river valley through what is called the hyporheic zone.

Floodplains are typically flat lands with relatively fertile soil and have been used for agriculture and other forms of development needing to be close to the river channel. The impact of these activities on the floodplain ecological functions and on the

infrequent flooding on human activities has led to the development of regulations to reduce the economic and social impacts from flooding. As summarized by Wohl (2021): "...a floodplain is intimately connected to the river channel and the underlying hyporheic zone." She continues: "This basic scientific understanding is commonly lost in a societal context, however, in which floodplains are treated separately from channels and subsurface water." She further explains that the channel is regulated while the floodplain is often treated as private property. Wohl (2021) concludes: "Many communities around the world also do not effectively recognize the connectivity of floodplains and channels. The easy access to water, navigation, and waste disposal in the channel, and to fertile soils and flat topography on floodplains, have encouraged human settlement on floodplains for millennia. When inundation, bank erosion, or channel avulsion occur as a result of flooding, a common response is to "put the river back in its place," engineer the channel for greater conveyance and stability, and block water from the floodplain with artificial levees."

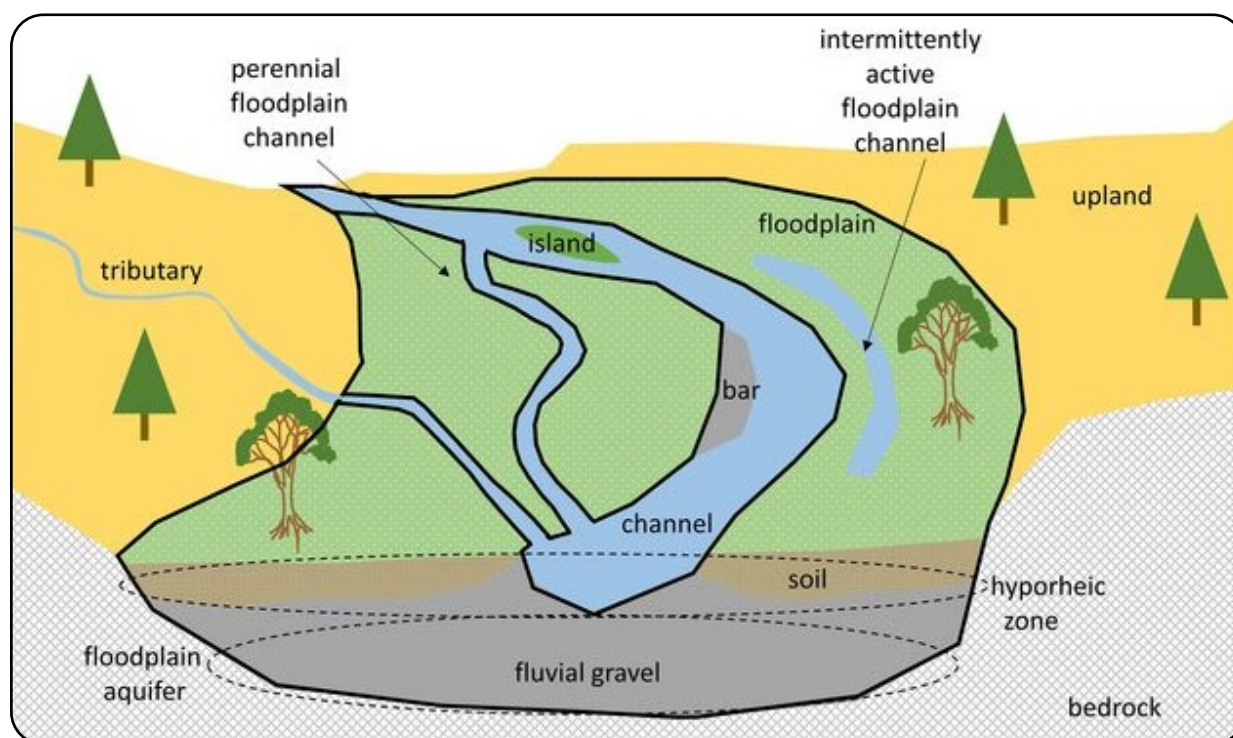


Figure 3: Floodplain characteristics and the relationships between the stream channel, floodplain, and floodplain aquifer (from Wohl, 2021)

The Ecology of Salem Area Floodplains

Flowing water and frequent disturbance by high flows causing channel changes and sedimentation create the geomorphic environment of the floodplain. Establishment of tree species adapted to recently deposited sediment and declining water availability characterizes the floodplain environment. There is a wealth of information on the floodplain dynamics and ecological relationships of the Willamette River. Much recent focus on the role of stream flow, species assemblages, water temperature relations and other factors affecting fish habitats in the Willamette River has been summarized by Flitcroft and others (2023).

Evaluation of the geomorphic and vegetation processes of the Willamette River is summarized by Wallick and others (2013). This work follows previous studies of cottonwood (*Populus trichocarpa*) colonization of gravel bars in the Willamette (Dykaar and Wingington, 2000; Cline and McAllister, 2011). The historic floodplain of the Willamette is described by Hulse and others (2003) as: “When the first EuroAmerican settlers arrived in the Willamette Valley, they found the valley clothed in tall grasses, so tall that cattle were hidden from view. The appearance was that of a “park” with wide swaths of grass punctuated by groves of spreading oak trees (Oregon white oak, and in Lane County some California black oak). Dense gallery forests lined the Willamette and its tributaries with associations of Douglas-fir, Oregon ash, black cottonwood, alder, bigleaf maple, western red cedar, and willows.” The historical vegetation of the Willamette Valley is constructed from General Land Office records (Christy and Alverson, 2011). Mapping from the 1850’s shows a continuous riparian forest along the floodplain surrounded by wet prairie and savanna. Riparian forest up to 8 km wide is documented along the Willamette River (Christie and Alverson, 2011). Johannessen and others (1971) describe the changes from settlement, fire reduction and forest harvest.

As Described in the Willamette Valley Conservation Study (USFWS, 2017): “It takes time for species to adjust to changed conditions, and from an

ecological and evolutionary standpoint, 150 years is just the blink of an eye. Significant habitat loss and fragmentation coupled with the invasion of noxious, non-native plants and animals and the loss of the fires and floods that rejuvenated and maintained the habitats has had pronounced effects on the wildlife and plants they support, or once supported.

Today, species are still adjusting and for many, the adjustment isn’t going particularly well. Evidence of this is found in the fact that there are now 12 species of fish, wildlife, and plants native to the valley whose population numbers are so low that they are listed as threatened or endangered under the federal Endangered Species Act (USFWS 1993a, 1997, 1998a, 2000, 2013b). Two other federally-listed species, the Oregon spotted frog and yellow billed cuckoo, historically bred in the valley, but are now extirpated. Many other species including western meadowlark, Oregon vesper sparrow, and yellow-breasted chat are considered by the State of Oregon to be threatened with extirpation from the valley (ODFW 2008). Grassland-dependent birds have suffered steep population declines and severe range contractions as they adjust to the new realities of the valley (Altman 1999, ODFW 2010). ODFW found that “In Oregon’s Willamette Valley, many grassland species have exhibited steady downward trends in distribution and abundance, with some likely having been extirpated as a breeding species” (ODFW 2010).”

Agricultural and urban development has reduced the wet prairies of the floodplains of the Willamette and tributary streams. The native prairies of western Oregon and southwestern Washington are among the most endangered ecosystems in the United States (Noss et al. 1995). Six native prairie species in the region – one butterfly and five plants – have been added to the Federal List of Endangered and Threatened Wildlife and Plants since 1988 pursuant to the Endangered Species Act of 1973, as amended (16 U.S.C. 1531, et seq.). The dependence on regular flooding and fire has led to significant reductions in the range of these species and extirpation from significant areas of developed land.

A broader view of the geomorphological and ecological processes that create floodplains are often more extensive than regulatory floodplains (*Figure 4*).

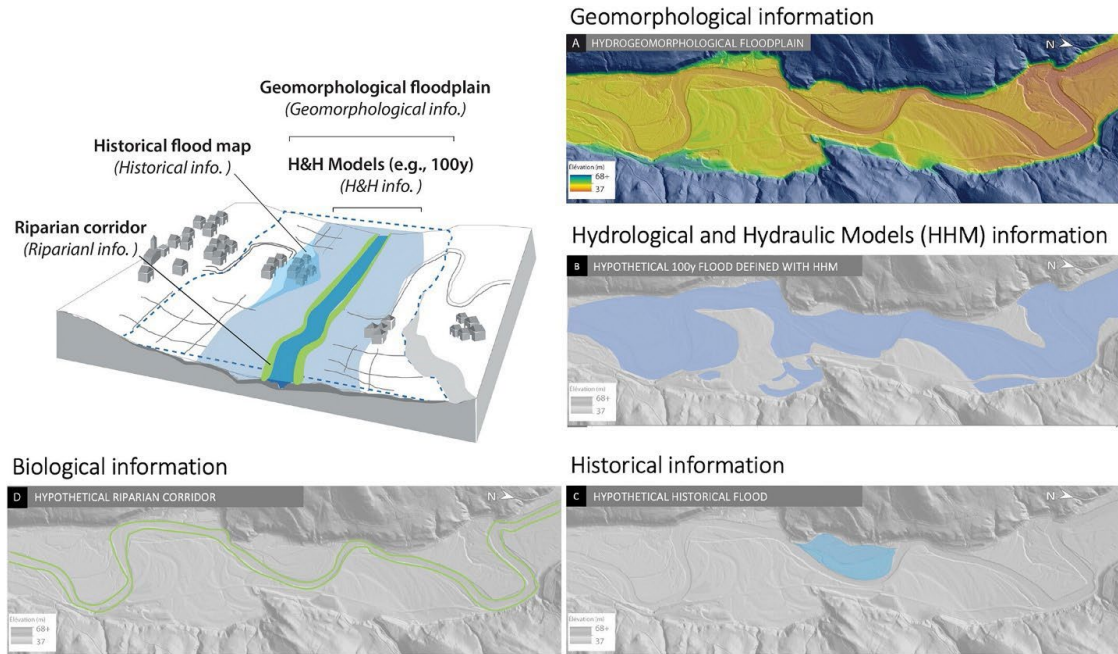


Figure 4: Comparison of Geological and Ecological Floodplain with Regulatory Floodplain (from Serra-Llobet et al., 2022a)

Floodplain Regulation and Regulatory Boundaries

The regulation of structures and development in floodplains is managed by local governments, however in Oregon, floodplain development regulations are required to comply with Oregon’s land use planning goals and uniform floodplain regulations have been required. The National Flood Insurance Program of the Federal Emergency Management Agency has developed minimum requirements for floodplain development that most communities have adopted. The minimum requirements for floodplain development are based on risk reduction from engineering analysis of the potential for flood rise effects. Floodplains are mapped and categorized according to the level of risk to development. The critical distinctions are between the floodway and floodplain (*Figure 5*).

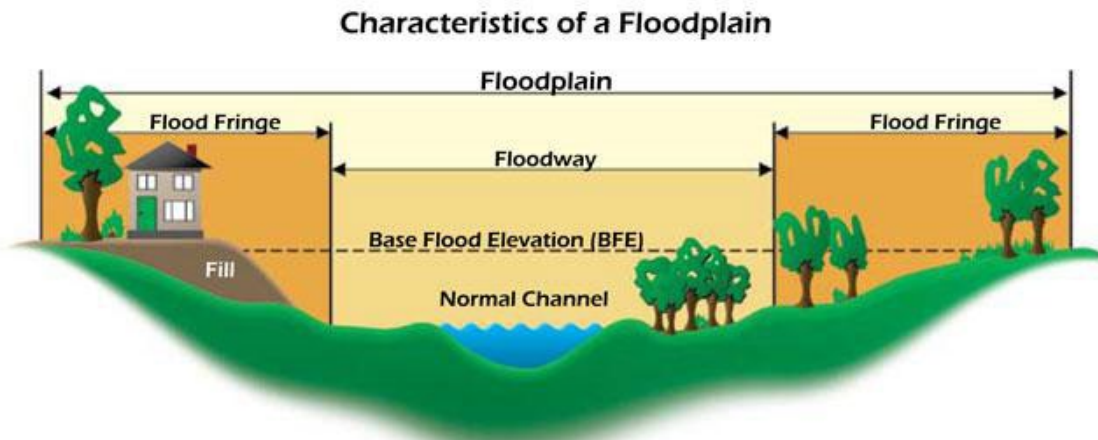


Figure 5: Regulatory characteristics of a stream and its floodplain

Source: NFIP Guidebook, FEMA

FEMA administers the National Flood Insurance Program (NFIP), a nationwide program that reduces future flood damage by requiring minimum floodplain management standards and provides protection for property owners against potential flood losses through insurance. The NFIP was established by the United States Congress in 1968 with the passage of the National Flood Insurance Act (NFIA) (42 United States Code [U.S.C.] §4001 et seq.). This law mandated that FEMA identify the nation's flood-prone areas and make insurance available to participating communities (local, tribal, and state governments) that implement floodplain management requirements that meet or exceed the minimum standards of the program. The NFIP is the primary source of flood insurance coverage for residential properties in the United States. Recent estimates of present and future flood risk (Wing et al., 2018) conclude: "Our analysis shows that

both FEMA flood maps and previous large-scale risk estimates likely significantly underestimate population exposure, while the latter simultaneously overestimates flood risk."

The Flood Insurance Rate Maps (FIRM) are developed under FEMA guidelines and standards as the official regulatory flood maps for a community (*Figure 6*). FEMA has delineated both the Special Flood Hazard Area (SFHA), and the risk premium zones applicable to the community. Within the SFHA insurance is obligatory for structures with federally backed mortgages and outside the SFHA insurance is recommended. The 1% NFIP standard was intended to be a standard for flood insurance rating and not a national standard for flood protection or land use planning. The FIRM mapping is available on the City of Salem website at <https://www.cityofsalem.net/community/safety/flooding/salem-s-local-floodplain-map>.

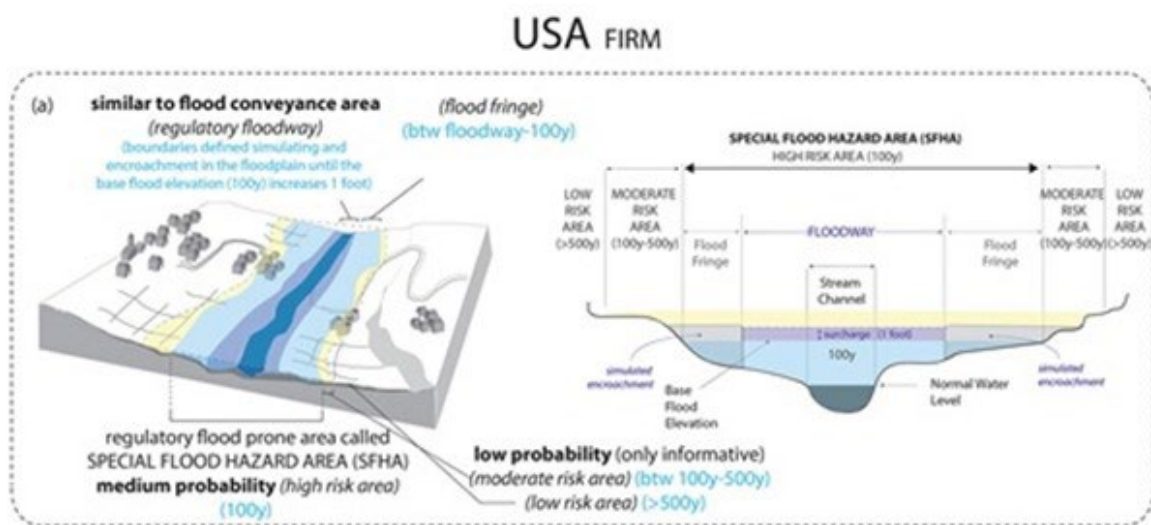


Figure 6: Flood Insurance Rate Map (FIRM) description (from Serra-Llabet et al., 2022a)

Salem's Floodplain Management Plan

The city of Salem has a strong history of planning for flood management. The City of Salem adopted a Floodplain Management Plan in 2013 and updated it in 2018. In October of 2023, the City of Salem completed the second update of the City of Salem Floodplain Management Plan. The plan was adopted by City Council on December 4, 2023. The objective of the City of Salem Floodplain Management Plan is to create an overall strategy of programs, projects and measures that will help reduce the adverse impact of flood hazards on the community. The plan includes a review of the action activities from the 2018 plan and identifies 42 action activities as either ongoing or scheduled for some timeframe in the future (either 0-2 or 3-5 years).

The plan includes the proposed action (Action Activity NR-4) to: "Prepare a Flood Species Assessment in conformance with CRS Activity 510" scheduled for 0-2 years from the adoption of the 2023 plan. This document "Salem Floodplain Species Assessment" is intended to complete that proposed action of the Salem Floodplain Management Plan 2023.

The City of Salem has a website that provides excellent information on the City Floodplain Management Program (<https://www.cityofsalem.net/community/safety/flooding>). The site has information on the importance of floodplains, flood preparedness, flood response, flood insurance and access to real time stream stage information.

Salem Floodplains and their Watersheds

Within the urban growth boundary of the City of Salem floodplains of the Willamette River and Mill Creek provide the greatest area of risk. Flooding also occurs in Battle Creek, Cinnamon Creek, Claggett Creek, Clark Creek, Croisan Creek, Davidson Creek, Gibson Creek, Glenn Creek, Golf Creek, Jory Creek, Laurel Creek, Little Pudding, Mill Race, Pettijohn Creek, Powell Creek, Pringle Creek, Scotch Creek, Shelton Ditch, Waln Creek,

and Winslow Creek. FEMA has only mapped floodplains in relatively small areas of the tributary streams to the Willamette, except for the extensive floodplain of Mill Creek. Evaluating floodplains for this assessment looks at the mapped floodplains and areas that experienced flooding in the last few major flood events (2012, 1996, and 1964).

Each creek in the Salem area is affected by the watershed conditions outside the City urban growth boundary. Each tributary system has distinct characteristics, ecology and hydrology. The following is a general description of each contributing stream and their watershed conditions affecting flooding in Salem.

THE DEFINITION OF FLOOD RISK (from Lane, 2017)

The probability that exposure to a hazard will lead to a negative consequence...'; and thus we can think of flood risk as being the probability of being exposed to flooding (the hazard) in a way that has negative consequences. The negative consequences can be broadly defined (e.g., the full range of impacts, economic, social, health and wellbeing, etc.) or narrowly defined (e.g., just the economic losses that would result from the exposure). Commonly, the term vulnerability can be used to represent this broadest sense. This definition is important because it emphasizes that flooding does not necessarily lead to a flood risk, as for that to happen there has to be a negative consequence. Floods can have positive consequences (e.g., for ecosystems) as well as negative ones.

Willamette River

The Willamette River watershed is fed by an approximately 11,478 square mile catchment. At Salem nearly all the major tributary flow has been contributed. The Willamette River is highly regulated by 13 federal flood control dams. The management of these dams results in less variable flows and reduced peak flows. Construction and operation of flood mitigation/hydropower dams have largely confined peak flows to the bankfull channel, decreasing the magnitude of large floods and the magnitude and frequency of small floods (Figure 7). The post dam flows are significantly below historic

flows. Flow regulation in the mainstem Willamette River has been implemented through the construction and integrated management of dams in its tributaries, that also serve as sources of hydropower. The last large flood of record occurred in the Willamette River system in 1964, as completion of upstream dams to regulate flow in the late 1960s effectively reduced high-flow events in the following decades. River flow modification alters habitat for in-stream species, and for floodplain species that depend on periodic inundation.

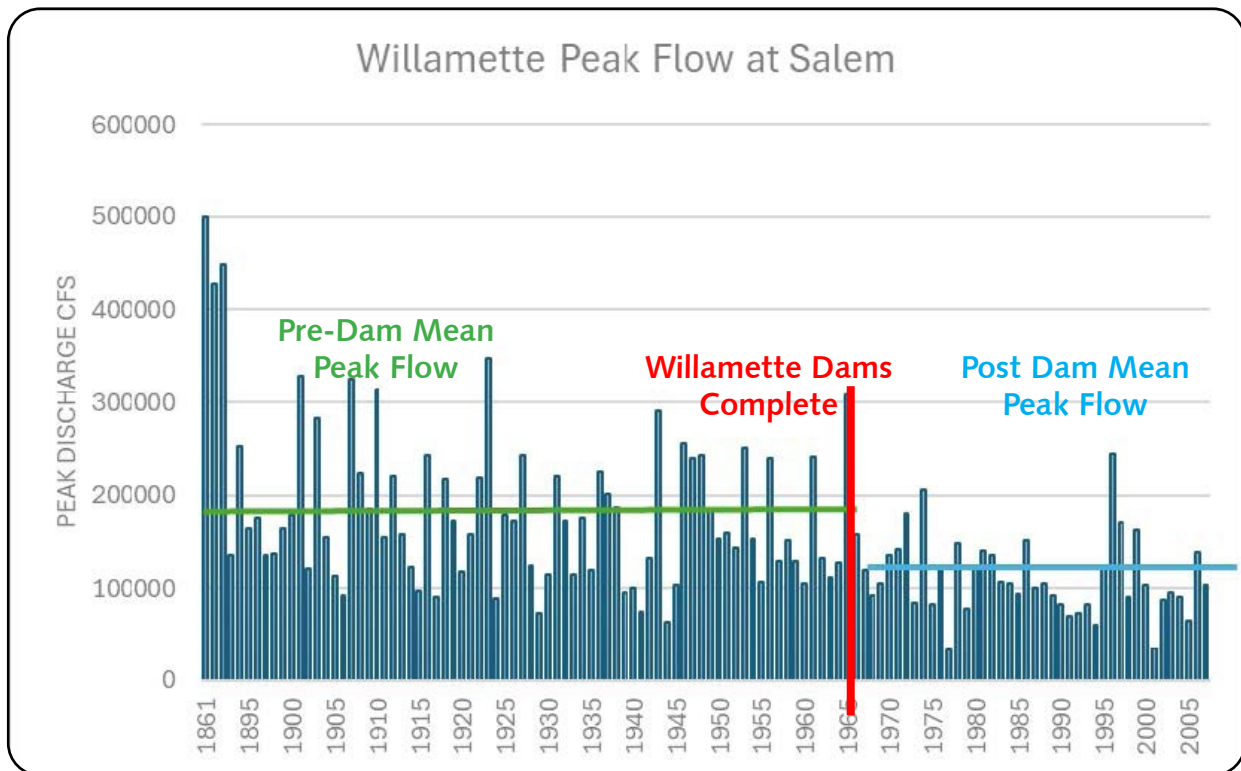


Figure 7: Peak annual discharge for the Willamette River at Salem showing the effect of dams on the upper river.

Mill Creek

Mill Creek is a 26-mile (42 km) tributary of the Willamette River that drains a 111-square-mile (290 km²) area of Marion County. Flowing generally west from its source south of Silver Falls State Park, it passes through the cities of Aumsville, Stayton, Sublimity, and Turner before emptying into the Willamette in Salem. Near river mile (RM) 18 or river kilometer (RK) 29, the creek receives Salem Ditch from the left; the ditch transports water from the North Santiam River to Mill Creek. Cutting through central Salem, the creek intersects Mill Race or Mission Ditch (another artificial channel diverting water to Pringle Creek) at RM 2.3 (RK 3.7). Most of the land in the watershed is privately owned. As of 2006, about 75 percent was used for farming, 13 percent for forestry, and 12 percent was urban. Artificial structures built in the mid-19th century altered the course of the original lower reaches of Mill Creek. Waller Dam, built around 1864 and modified in 1915, split Mill Creek into a millrace and what is sometimes referred to as North Mill Creek. The millrace, which originally powered a woolen mill, flows through the Willamette University campus.

Another diversion canal, Shelton Ditch, built in the mid-1800s, runs from Mill Creek near the municipal airport through the southern edge of downtown Salem. It empties into Pringle Creek near Pringle Park. Mill Creek has the most extensive floodplain through the City of any of the tributary streams to the Willamette.

Glenn Creek

The Glenn Gibson basin is located in Polk County and drains 10.4 square miles of west Salem. Approximately half of the basin is within the Urban Growth Boundary (UGB). The basin terrain is steep, particularly in the upper reaches, with flatter slopes near the basin outlet. There are over 20 small tributaries in the basin. The two main drainage channels are Glenn Creek and Gibson Creek. The Glenn Gibson basin is experiencing rapid growth in the upper-western reaches inside the UGB. Some development is also occurring outside the UGB in Polk County. Glenn Creek originates outside the UGB, and flows east through agricultural areas and

residential developments. It eventually flows into the West Willamette Slough. Gibson Creek is a tributary of Glenn Creek. It originates outside the UGB near Eagle Crest Road NW and flows east through primarily agricultural and rural residential areas to a confluence with Glenn Creek near Wallace Road NW.

Claggett Creek

The Upper Claggett Creek basin drains 7.4 square miles, all of which are within the Urban Growth Boundary. The Upper Claggett basin drains into Claggett Creek, which flows through the city of Keizer and is a tributary of the Willamette River. The basin slope is very flat. The Upper Claggett Creek basin is highly developed, with land use including single and multi-family residential, industrial, commercial, rural, and agricultural areas. Two existing city-owned regional detention facilities are located in the basin: (1) the 37th Place NE facility; and (2) the Eastgate Soccer Field.

Pringle Creek

Pringle Creek Basin is a drainage area located in the City of Salem between the Battle Creek Basin to the south and the Mill Creek Basin to the north. The majority of Pringle Creek Basin is developed residential, commercial, and industrial land use. The southwest portion of the basin contains undeveloped agricultural land, forest, and grassland. The outlet for Pringle Creek Basin is the Willamette Slough, a backwater area of the Willamette River next to Minto Brown Island. Prior to its confluence with the Willamette Slough, two Mill Creek diversion channels, Shelton Ditch and Mill Race, discharge into Pringle Creek. Since the primary source of these diversion channels is Mill Creek, the channels and their contributing drainage areas are part of the Mill Creek Basin.

Smaller Tributaries

Portions of the Little Pudding River, Battle Creek, Croisan Creek, Pettijohn Creek, Willamette Slough and small drainages on the Willamette floodplain are all within the urban growth boundary of Salem.

Floodplain Development

The floodplains of the Salem area have changed significantly over time. Salem in 1862 was a small outpost community with a mill on Mill Creek (*Figure 8*). Goulder (1909) visited the Salem area in 1845-1846 and noted: “On Mill Creek, not far from the “Institute,” there were a grist-mill, a saw-mill, and a boarding-house.” He further observed that “The greater part of the area upon which the city of Salem was afterwards built, was then a well-cultivated wheat-field...”

As the community grew, the floodplain was altered to fit the growing city. Thirty years later the city of Salem occupied the east bank of the Willamette River with mills on the tributary creeks (*Figure 9*). At that time the population of Salem was some 3,400 residents.

Early development in Salem was laid out on a rectangular grid of ownership with only limited recognition of floodplain conditions. Through time the watershed was significantly altered (*Figure 10*) by urbanization, flood control, road and railroad construction, agriculture, and channel modification (clearing and snagging, revetment, channel simplification, etc.) as illustrated by Flitcroft and others (2023). The modern floodplain reflects the geomorphological template, biological conditions and socio-economic footprint of Salem.



Figure 8: Salem Area 1862 from Map of the Surveyed Portions of Oregon Territory 1862

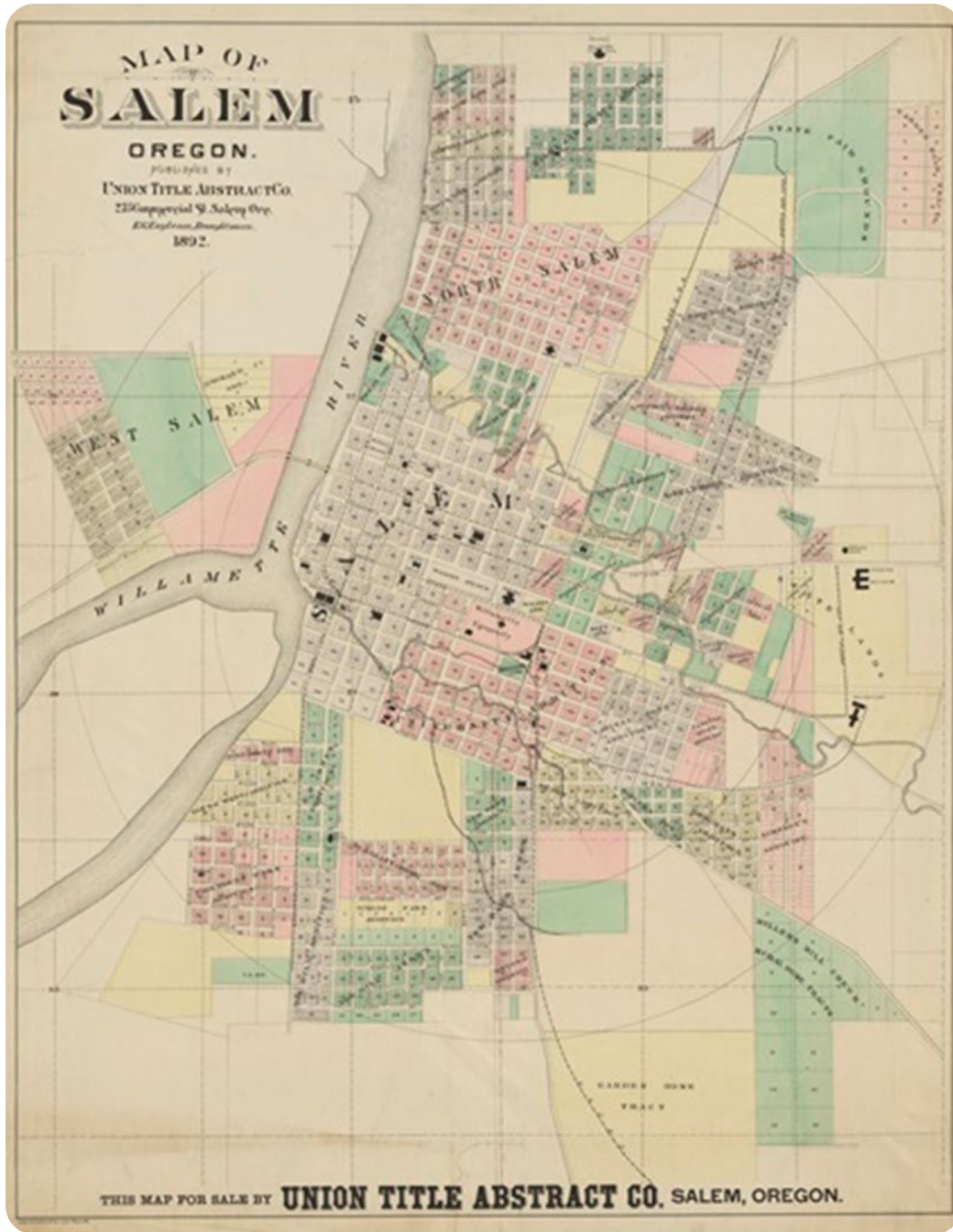


Figure 9: Salem 1892

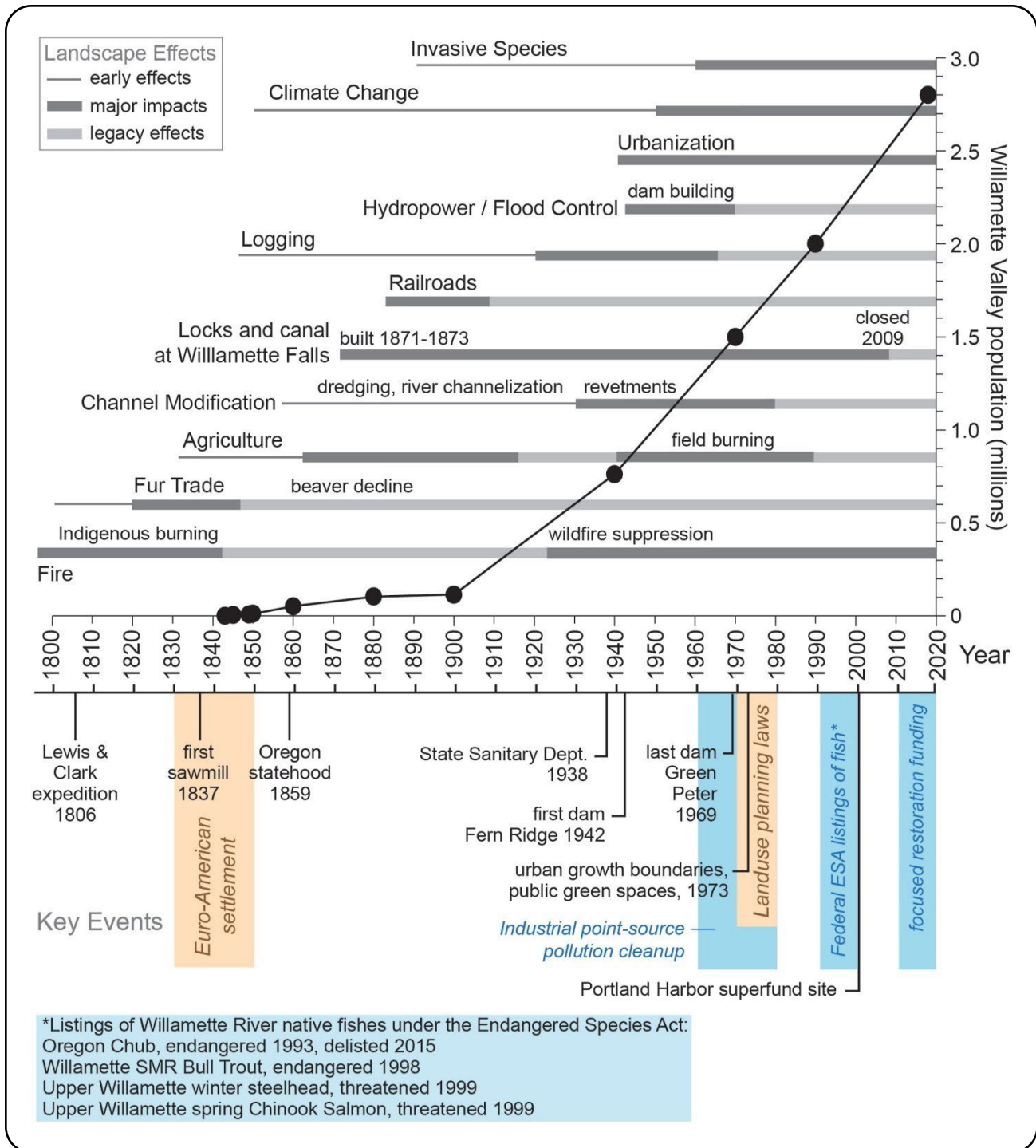


Figure 10: Watershed development chronology in the Willamette Basin (from Flitcroft et al., 2023)

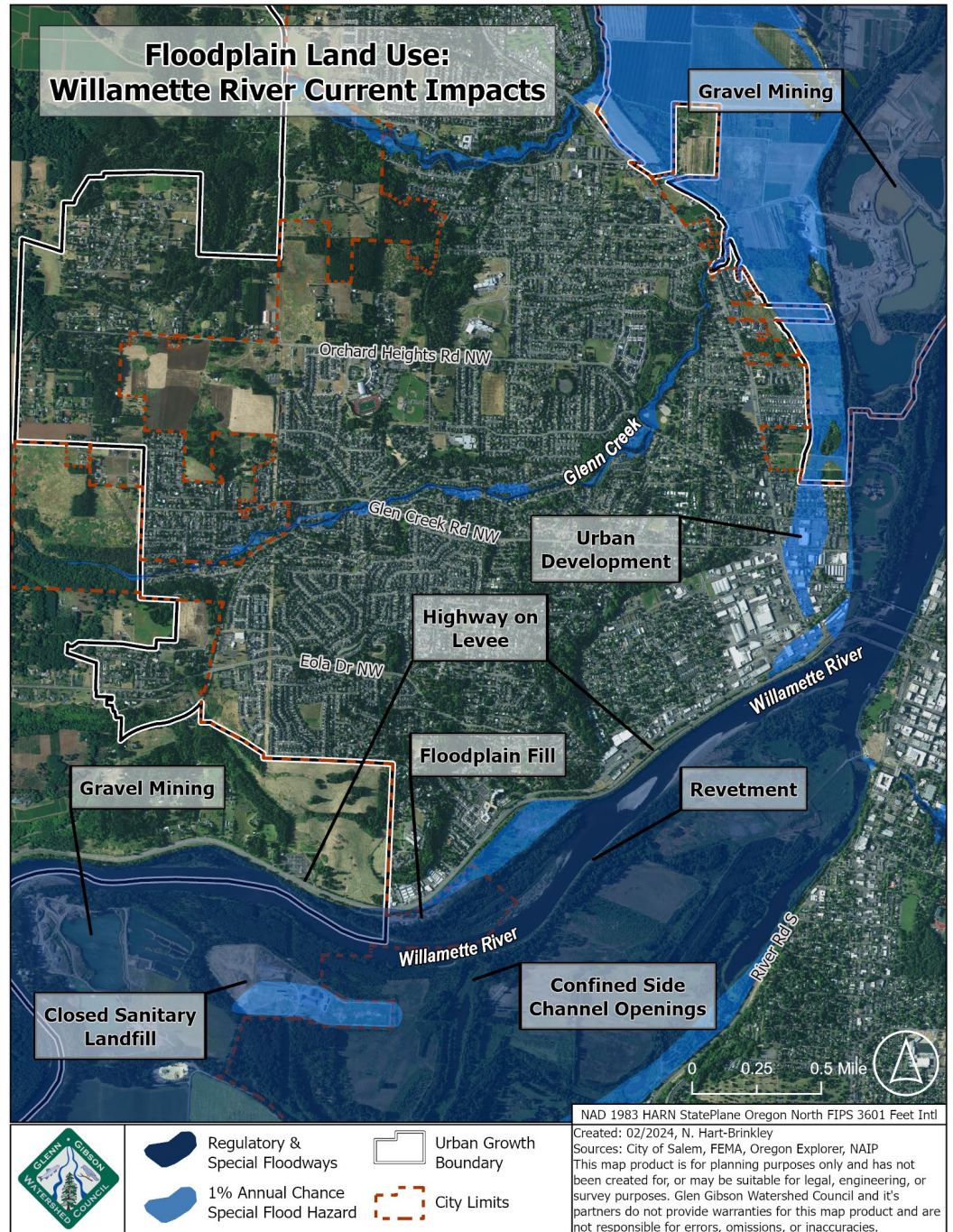


Figure 11: Willamette floodplain development and 1964 flood conditions.

Current Floodplain Conditions

Major alterations to the floodplains in the Salem area include urban development, gravel mining, fill, sanitary landfill, forest clearing, industrial development, riprap, and other conditions that define the current regulatory floodplain (Figure 11). These historic decisions affect the ability to prevent impacts and make flood impact management more difficult.

Similarly, the Mill Creek floodplain has been significantly developed by industrial, residential and gravel extraction over time. The result is a significant area of at-risk properties (Figure 12).

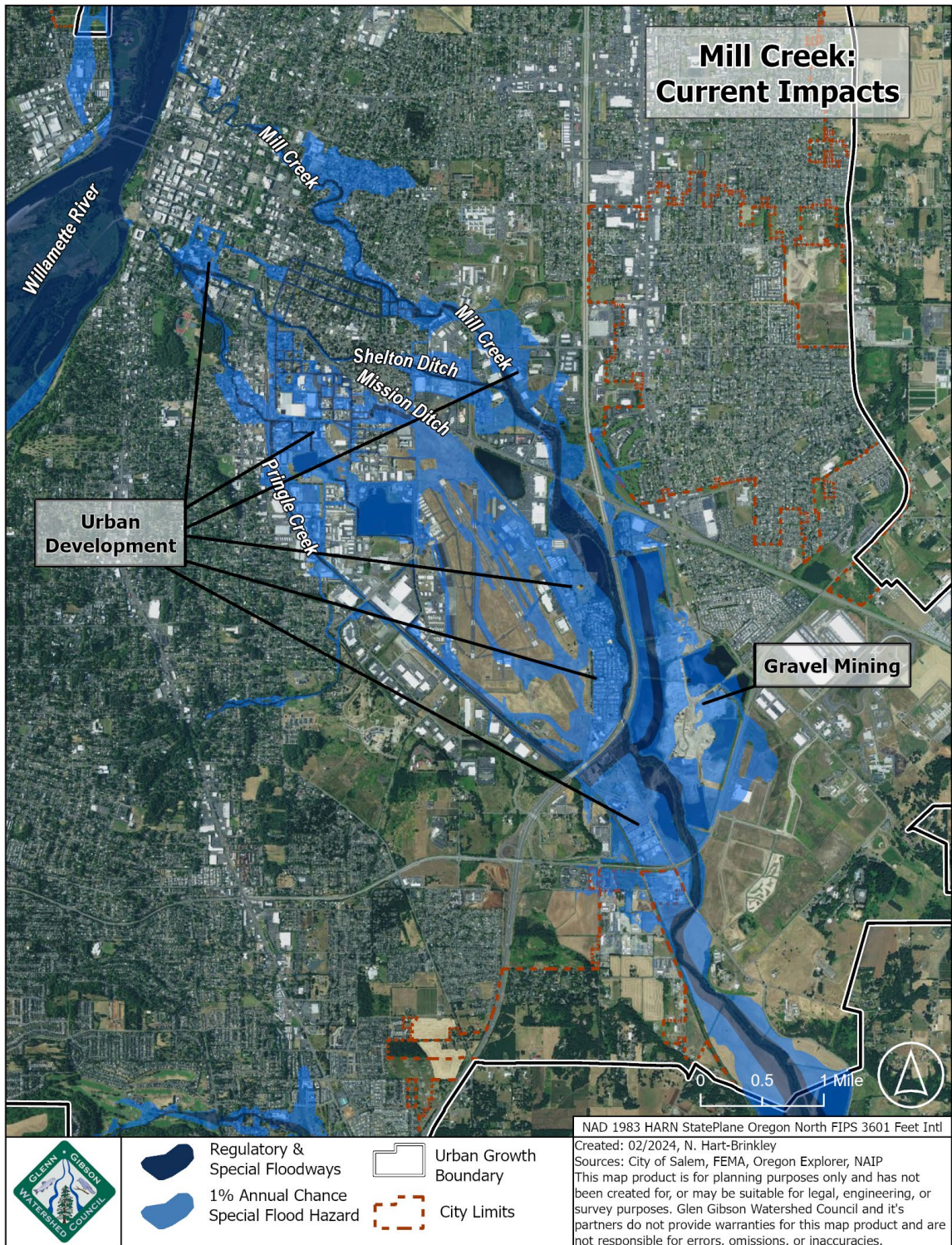


Figure 12: Mill Creek Floodplain showing current development affecting floodplain conditions.

Floodplain Species

Threatened and Endangered Species

The cumulative development of the Willamette Valley has resulted in simplification of the Willamette River and its floodplain reducing its capacity to support native fish. Conversion of the valley floor floodplain to agriculture and urban uses has led to the listing of wetland and wet prairie species under the federal Endangered Species Act. A review of FEMA’s Flood Risk and Endangered Species Habitat (FRESH) website found seven species federally listed as threatened, one listed as endangered and two proposed for listing having their range in the Salem area. Marbled murrelet, a threatened species was identified as a species in proximity to Salem in the FRESH data. Suitable habitat for murrelet is

not found in the Salem area so it was not further considered. These are shown in *Table 1*. While the Upper Willamette Chinook salmon, and Upper Willamette steelhead are anadromous and spend most of their lives in salt water, this assessment focuses on their freshwater habitat in the waterways in Salem’s jurisdiction. While not directly affected, Upper Columbia, Middle Columbia, Lower Columbia, and Snake River salmon and steelhead listed species could be affected by downstream effects of both floodplain development and conservation actions. There is an abundance of information on the Willamette River as habitat for salmon and steelhead.

Threatened and Endangered Species in Salem					
Species	Scientific Name	Federal		State	
		Status	Agency ¹	Status	Agency ²
Upper Willamette Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Threatened	NMFS	Sensitive	ODFW
Upper Willamette Steelhead	<i>Oncorhynchus mykiss</i>	Threatened	NMFS	Sensitive	ODFW
Oregon spotted frog	<i>Rana pretiosa</i>	Threatened	USFWS	Sensitive	ODFW
Streaked Horned Lark	<i>Eremophila alpestris strigata</i>	Threatened	USFWS	Species of Concern	ODFW
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Threatened	USFWS		ODFW
Oregon Vesper Sparrow	<i>Poocetes gramineus affinis</i>	Petitioned for Review	USFWS	Sensitive	ODFW
Northwestern Pond Turtle	<i>Actinemys marmorata</i>	Proposed Threatened	USFWS	Sensitive	ODFW
Fender's Blue Butterfly	<i>Icaricia icarioides fenderi</i>	Threatened	USFWS		
Monarch Butterfly	<i>Danaus plexippus</i>	Candidate Species	USFWS		
Kincaid's Lupine	<i>Lupinus sulphureus ssp. kincaidii</i>	Threatened	USFWS	Threatened	ODA
Willamette Daisy	<i>Erigeron decumbens</i>	Endangered	USFWS	Endangered	ODA

Table 1: Salem Floodplain Threatened and Endangered Species

1 NMFS = National Marine Fisheries Service, USFWS = U.S. Fish & Wildlife Service

2 ODFW = Oregon Department of Fish & Wildlife, ODA = Oregon Department of Agriculture

Range and Critical Habitat Salmon and Steelhead

Critical habitat for Upper Willamette River (UWR) Chinook (*Oncorhynchus tshawytscha*) Evolutionarily Significant Unit (ESU) and Upper Willamette River steelhead (*Oncorhynchus mykiss*) Distinct Population Segment (DPS) was designated by Federal Regulations on September 2, 2005 (FR notice: 70 FR 52630). The National Marine Fisheries Service uses the following definition for critical habitat boundaries (from 70 FR 52630). “Critical habitat includes the stream channels within the designated stream reaches, and includes a lateral extent as defined by the ordinary high-water line (33 CFR 319.11). In areas where ordinary high-water line has not been defined, the lateral extent will be defined by the bankfull elevation.

Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain and is reached at a discharge which generally has a recurrence interval of 1 to 2 years on the annual flood series.

(c) Primary constituent elements. Within these areas, the primary constituent elements essential for the conservation of these ESUs are those sites and habitat components that support one or more life stages, including:

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;

(2) Freshwater rearing sites with:

(i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;

(ii) Water quality and forage supporting juvenile development; and

(iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;”

The stream reaches listed as critical habitat for Upper Willamette River Chinook salmon winter steelhead includes the estimated two-year flood zone of the Willamette River as displayed in **Figure 13**. Critical habitat on the Willamette is shown to the two-year flood extent and designation of critical habitat includes Mill Creek, Shelton Ditch, lower Glenn Creek, and West Fork Little Pudding River within the Salem urban growth boundary.

Essential Fish Habitat, under the Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act requires the Secretary of Commerce to coordinate with, and provide information to, other Federal agencies regarding the conservation and enhancement of Essential Fish Habitat. Essential fish habitat (EFH) means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of essential fish habitat: “Waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle. Essential fish habitat must be described and identified in Fishery Management Plans. In 2002, NMFS began to require that the plans also contain maps of EFH. The Magnuson Stevens Act requires NMFS to work with other Federal agencies to conserve and enhance EFH. As a result, whenever Federal agencies authorize, fund, or carry out actions that may adversely impact EFH, they must consult with NMFS regarding the impact of their activities on EFH. NMFS must provide the consulting Federal agency with EFH conservation recommendations for any action that would adversely affect EFH. Within 30 days of

receiving these recommendations, the consulting action agencies must provide a detailed response in writing to NMFS that includes measures proposed to avoid, minimize, or offset the impact of proposed activities on EFH. There is a good deal of overlap between designated EFH and Critical Habitat in the freshwater environment (*Figure 14*). To streamline the consultation process, NMFS attempts to conduct EFH and ESA Section 7 consultations in conjunction with each other whenever possible.

Oregon Essential Indigenous Anadromous Salmonid Habitat

Under ORS 196.810(1)(g)(B) “Essential indigenous anadromous salmonid habitat” means the habitat that is necessary to prevent the depletion of indigenous anadromous salmonid species during their life history stages of spawning and rearing, and 196.810(1)(g) (C) “Indigenous anadromous salmonid” means chum, sockeye, Chinook and Coho salmon, and steelhead and cutthroat trout, that are members of the family Salmonidae and are listed as sensitive, threatened or endangered by a state or federal authority. The Oregon Department of State Lands in consultation with Oregon Department of Fish and Wildlife has identified the extent of stream reaches that these definitions apply to. These stream reaches have additional state regulatory review for the placement of fill or removal of material under Oregon law (ORS 197.810). Essential Indigenous Anadromous Salmonid Habitat (*Figure 15*) is found in the Willamette River, Mill Creek, West Fork of the Pudding River and lower Glenn Creek.



Figure 14: Salmon and Steelhead Critical Habitat and estimated Willamette River two-year flood level (critical habitat from NMFS, two-year flood mapping from River Design Group)

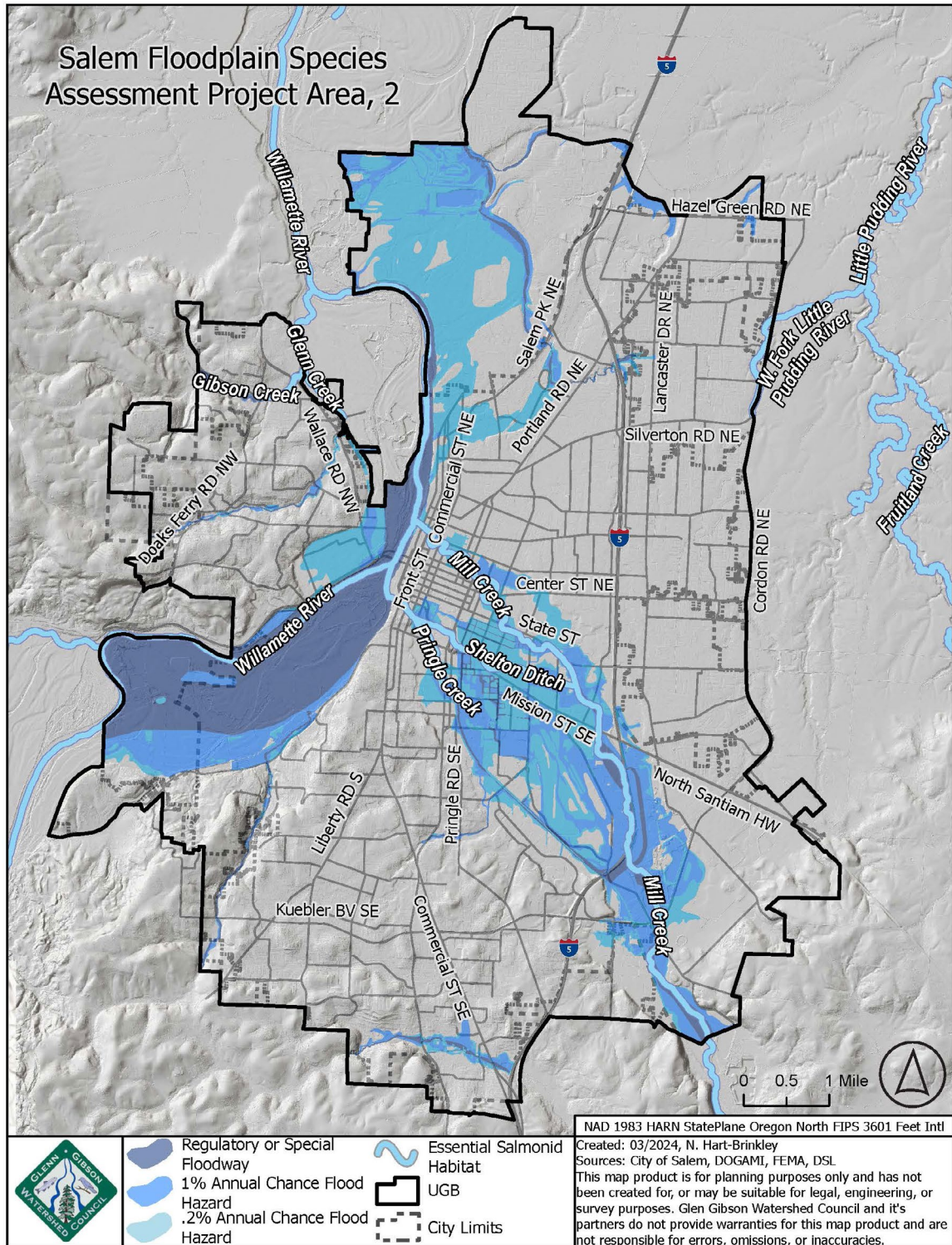


Figure 15: Essential Indigenous Anadromous Salmonid Habitat in the Salem area.

Range, Habitat and Recovery Plan for Streaked Horned Lark

In the 2021 Federal Register notice on the review of the Threatened listing of Streaked Horned Lark (*Eremophila alpestris strigata*) were described as: “Streaked horned larks historically selected habitat in relatively flat, open areas maintained by flooding, fire, and sediment transport dynamics. The interruption of these historical processes due to flood control dams, fire suppression, and reduction of sediment transport by dams resulted in a steep decline in the extent of historical habitat for the lark.

Currently, larks are found in open areas free from visual obstructions like grasslands, prairies, wetlands, beaches, dunes, and modified or temporarily disturbed habitats (such as agricultural or grass seed fields, airports, dredged material placement sites, and gravel roads). Streaked horned larks need relatively flat landscapes with sparse vegetation, preferring habitats with an average of 17 percent bare ground for foraging and 31 percent of bare ground for nesting (Altman 1999, p. 18). Typically, preferred habitats contain short vegetation, contain forbs and grasses that are less than 13 inches (in) (33 centimeters (cm)) in height, and have few or no trees or shrubs (Altman 1999, p. 18; Pearson and Hopey 2005, p. 27). The large, open areas used by populations of larks are regularly disturbed via burning, mowing, herbicide application, crop rotation, dredging material placement, and/or other anthropogenic regimes.”

Specific to the Salem area the review noted: “One historical site for a local population in this region (Salem Municipal Airport) has no positive records since 2013 and appears to be extirpated. The Willamette Valley regional population appears to be well distributed and increasing, but the limited surveys of accessible sites may not accurately reflect the trend in the whole region.”

Salem is in the North Willamette recovery zone as identified in the draft recovery plan (USFWS, 2019).

Range, Habitat and Recovery Plan for Willamette Prairie Species

The Willamette Valley Upland Prairie and Savanna is recognized as one of the most critically endangered ecosystems of the United States (Noss et al. 1995). Native species and ecosystems may be at an ecological tipping point due to the diminished and fragmented native habitats in the Valley, as evidenced by the declining populations and range contractions of many native fish, wildlife, and plant species. Eleven species native to the valley have been listed under the federal Endangered Species Act (ESA). Many other species have been extirpated and many more are threatened with extirpation, including western meadowlark, the Oregon State Bird (ODFW 2021). Extirpation refers to a species of plant or animal that ceases to exist in a given geographic area (e.g., the Willamette Valley), though it still exists elsewhere. A focus on grasslands (prairies and oak savannas) and oak woodlands is justified by the fact that very little of these habitats remain, and what does remain now occurs as remnant patches scattered across the valley (ODFW 2016).

Eleven species of fish, wildlife, and plants native to the valley have been listed as threatened or endangered under the federal Endangered Species Act (USFWS 1993, 1997, 1998, 2000, 2013). Three other federally listed species, the Columbian white-tailed deer (*Odocoileus virginianus leucurus*), Oregon spotted frog (*Rana pretiosa*), and yellow-billed cuckoo (*Coccyzus americanus*) historically bred in the valley but are now extirpated.

The prairie species recovery plan was developed for the following five prairie species native to the Willamette Valley:

- Fender’s blue butterfly (*Icaricia icarioides fenderi*)
Endangered
- Willamette daisy (*Erigeron decumbens*)
Endangered
- Bradshaw’s lomatium (*Lomatium bradshawii*)
Endangered
- Kincaid’s lupine (*Lupinus sulphureus ssp. kincaidii*) Threatened
- Nelson’s checker-mallow (*Sidalcea nelsoniana*)
Threatened

Willamette Daisy and Nelson’s checker-mallow have been documented in the Salem area and occupy floodplain areas. An additional goal of the recovery plan is to focus on the restoration of both native upland and wet prairie ecosystems in the valley. This ecosystem approach takes into consideration the needs of non-listed species that are endemic to prairie habitats. Consequently, many of the recovery actions proposed in the plan may help to stabilize and enhance populations of species such as pale larkspur (*Delphinium leucophaeum*), Willamette Valley larkspur (*Delphinium oregonum*), peacock larkspur (*Delphinium pavonaceum*), shaggy horkelia (*Horkelia congesta ssp. congesta*), white-topped aster (*Sericocarpus rigidus*), and Hitchcock’s blue-eyed grass (*Sisyrinchium hitchcockii*). Implementing management actions toward these species of conservation concern may preclude the need to extend the protections of the Endangered Species Act to other prairie species in the future (USFWS 2010).

Since the listing decision in the 1990’s, Bradshaw’s lomatium achieved recovery objectives in terms of protected populations of sufficient size and distribution across the valley’s recovery zones to allow the species to be delisted. Golden paintbrush,

once extirpated in Oregon, has met recovery objectives and also has been delisted. The same can be said for Nelson’s checker-mallow – recovery objectives have been met and the species has been delisted. Fender’s blue butterfly is also on the path to recovery. While the Service is proposing to reclassify the species from endangered status to threatened status, additional actions, including protecting its habitat, are still needed to fully recover this species.

The closest known populations of Fender’s blue butterfly and Kinkade’s lupine are at Basket Slough, west of the Salem area outside the Salem UGB.

Bald and Golden Eagle Protection Act of 1940

This federal law prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald or golden eagles, including their parts (including feathers), nests, or eggs. The Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” Regulations further define “disturb” as “to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior”. In addition to immediate impacts, this definition also covers effects that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle’s return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment. Since Bald eagles have become more abundant along the Willamette River, the prohibitions of the act are important to be aware of.

Floodplain Habitats and Associated Species

While identifying the presence of threatened or endangered species often requires biological expertise, recognizing the habitats that they are most likely to occupy can help to determine if they could be present. The following is a general description of floodplain habitats, how to identify them and what species may be associated with them. The typical floodplain habitats in the Salem area include riparian forest and shrublands, wet prairie, marsh, pond, and stream channel.

Riparian Forest and Shrubland

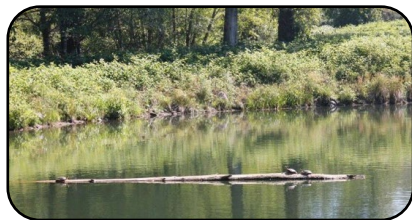
Cottonwood Oregon Ash and other forest species can provide a dense gallery along streams in the Willamette Valley. There has been significant study of the changes in Willamette Valley Floodplain forests (Christy and Alverson, 2011; Benner and Sedell, 1997; Gregory et al., 2019; Hulse et al., 2003; Johansen et al., 1971; Sedell and Froggatt, 1984; Wallick et al., 2013). These forests are often multistoried (have ground covering plants, shrubs, and trees) and typically dense.



While not likely to occur in the Salem area this is the habitat that supports yellow-billed cuckoo. Great Blue Heron, Osprey, Bald Eagles and willow flycatcher among other species use riparian forests for nesting and perching.

Ponds

Floodplain depressions from flood scour or gravel removal or other activities that intercept the groundwater table and hold water year-round are considered ponds. This is a unique habitat that can be



found both on the Willamette floodplain and the Mill Creek floodplain. Ponds provide habitat for Western Grebe, Oregon spotted frog and northwest pond turtles. *Howellia* can also be found on pond edges.

Wetlands

Wetlands that are dominated by grass like and grass plants (sedges, reeds, etc.) are often found in floodplain locations. These habitats have standing water or are saturated to the surface for prolonged periods in the dry season. Species typically found there could be lesser yellowlegs, and possibly White-topped aster.



Prairies

Slightly up slope and on sloping portions of the floodplain are grassy prairies often with scattered Oregon White Oak. The Willamette Valley prairie habitat supports streaked horned lark, Willamette daisy, Kincaid's lupine the host plant for Fender's blue butterfly. These sites also support golden paintbrush, Peacock larkspur. Thin-leaved peavine and Bradshaw's lomatium are often found in areas of ground disturbance or along ditch banks with meadow checkermallow. These sites are typically outside the floodplain.



Creeks and Streams

The tributary streams to the Willamette River and the Willamette River are important habitats for a number of species. It is well recognized that fish are dependent on streams for their life histories. The streams that constitute



and cross the floodplains of the Salem area support Chinook salmon, steelhead, cutthroat trout, Pacific lamprey, Western brook lamprey, and western pearlshell mussels. Western brook lamprey spawn in the small streams tributary to the Willamette. It should be noticed that the flooded forest and marshes are used by juvenile salmon and steelhead during flood stage of the rivers. It is important to understand that critical habitat for salmon and steelhead extends across the floodplain in its regular flood range (usually 2-year flood).

Species of Concern

There are other species that occur or occupy habitats found in Salem's floodplains that, while not federally listed, are species of concern (*Table 2*).

Species of Concern in Salem				
Species	Scientific Name	Status	Listing Agency	Salem Observation
Fish				
Pacific lamprey	<i>Entosphenus tridentatus</i>	SoC, S	NMFS, ODFW	X
Western brook lamprey	<i>Lampetra richardsoni</i>	S	ODFW	X
Coastal cutthroat trout (Upper Willamette River ESU)	<i>Oncorhynchus clarkii</i>	SoC, Sensitive	NMFS, ODFW	X
Birds				
Bald Eagle	<i>Haliaeetus Leucocephalus</i>		Eagle Act	X
California Gull	<i>Larus Californicus</i>	BCC		X
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	BCC		X
Lesser Yellowlegs	<i>Tringa flavipes</i>	BCC		Nearby
Olive-sided Flycatcher	<i>Condopus cooperi</i>	BCC		X
Rufous Hummingbird	<i>Selasphorus rufus</i>	BCC		X
Western Grebe	<i>Aechmorrhous occidentalis</i>	BCC		X
Oregon Vesper Sparrow	<i>Pooecetes gramineus</i>	SoC	Under Review	
Great Blue Heron	<i>Ardea herodias</i>			X
Willow Flycatcher	<i>Empidonax traillii</i>			X
Yellow-breasted Chat	<i>Icteria virens</i>	BCC		X

Table 2: Sensitive Species in the Salem Floodplain Area (continues on next page)

(continued from previous page)

Table 2: Sensitive Species in the Salem Floodplain Area

Invertebrates				
Western pearlshell (mussel)	<i>Margaritifera falcata</i>			
Oregon giant earthworm	<i>Driloleirus macelfresh</i>	SoC	USFWS	
Foliaceous lace bug	<i>Derephysia foliacea</i>			
Taylor's checkerspot (butterfly)	<i>Euphydryas editha taylori</i>	E	USFWS	
Sonora skipper (butterfly)	<i>Polites sonora siris</i>			
Valley silverspot (butterfly)	<i>Speyeria zerene bremnerii</i>			
Franklin's bumble bee	<i>Bombus franklini</i>	SoC	ODFW	
Plants				
Tall bugbane	<i>Cimicifuga elata</i> Nutt. var. <i>elata</i>	C	ODA	X
Willamette Valley larkspur	<i>Delphinium oreganum</i> T.J. Howell	SoC	USFWS, ODA	
Peacock larkspur	<i>Delphinium oreganum</i> T.J. Howell	SoC, E	USFWS, ODA	
Western wahoo	<i>Euonymus occidentalis</i> Nutt. ex Torr			
Shaggy horkelia	<i>Horkelia congesta</i> Dougl. ex Hook. ssp. <i>congesta</i>	SoC, C	USFWS, ODA	X
Howellia	<i>Howellia aquatilis</i> Gray	Delisted, T	USFWS, ODA	X
Thin-leaved peavine	<i>Lathyrus holochlorus</i> (Piper) C.L. Hitchc.	SoC, E	USFWS, ODA	X
Bradshaw's lomatium	<i>Lomatium bradshawii</i>	Delisted, E	USFWS, ODA	
Loose-flowered bluegrass	<i>Poa laxiflora</i> Buckl			
Weak bluegrass	<i>Poa marcida</i> A.S. Hitchc.			
Narrow-flower bluegrass	<i>Poa stenantha</i> Trin			
White-topped aster	<i>Sericocarpus rigidus</i>	SoC, T	USFWS, ODA	X
Meadow checkermallow	<i>Sidalcea campestri</i> Greene			X
Nelson's sidalcea	<i>Sidalcea nelsoniana</i> Piper	Delisted, T	USFWS, ODA	X
Golden paintbrush	<i>Castilleja levisecta</i>	Delisted, E	USFWS, ODA	X

Community Rating System Credit for Conservation and Recovery

A good number of the conservation and recovery actions that local governments can implement can be credited under the Community Rating System (CRS). The CRS provides reduced flood insurance premiums in communities that undertake activities to prevent or reduce flood losses and protect natural floodplain functions. Salem is currently a CRS Class 3 as of April 1, 2024. It means that starting April 1, 2024, Salem residents in flood-prone areas can get a 35% discount on most federal flood insurance premiums. Salem is currently in the top 1% of communities in the U.S. to achieve this designation. Implementing more activities, such as threatened and endangered species recovery actions, could help the City move to a better class. The current credit score for Salem is 3,644. To obtain CRS Class 2 with a 40% discount on flood insurance, the City needs to achieve a score of 4,000 CRS credit points. This Floodplain Species Assessment will provide an additional 15 CRS credit points towards that improved class rating.

Table 3 reviews general CRS-credited recovery actions that are applicable to most threatened and endangered species. The “Doing” column identifies whether the City is implementing what is or could be a CRS credited activity. If the City is getting credit, the “Credited” column shows the current CRS credit points and the maximum credit available. The “Feasible” column identifies if it would be feasible to start an activity or increase the credit points.

CRS-Credited Conservation and Recovery Actions					
Activity/Element	Page ¹	Section in Manual ²	Doing?	Credited?	Feasible?
300 Public Information Activities					
Providing information on areas that serve natural floodplain functions, such as wetlands (MI7)	11	322.g	YES	20/20	YES
Outreach projects (OP) with messages on protecting natural functions	11	332.a	YES	200/200	YES
Designing and disseminating messages on protecting natural floodplain functions in a program for public information (PPI)	12	332.c	YES	80/80	YES
Having materials in the local public library (LPD) on protecting local natural floodplain functions	13	352.b	YES	10/10	YES
Having materials on protecting local natural floodplain functions in the community's website (WEB)	13	352.c	YES	77/77	YES
420 (Open Space Preservation)					
Preserving open space in the floodplain (OSP)	15	422.a	YES	681.5/1450	YES
Preserving open space in the floodplain in its natural state (NFOS)	16	422.c	YES	180/350	YES
Preserving open space on eroding shorelines (CEOS ³)	16	422.e	N/A	N/A	N/A
Offering incentives to developers to keep the floodplain open (OSI)	16	422.f	NO	0/250	NO
Zoning floodprone areas for large lot sizes to preserve low density uses (LZ)	17	422.g	NO	0/600	NO
Preserving stream banks and shorelines in their natural state (NSP)	17	422.h	NO	0/120	YES
430 (Higher Regulatory Standards)					
Prohibiting filling in the floodplain (DL1a)	18	432.a(1)	NO	0/280	NO
Regulating development in areas subject to coastal erosion (CER ³)	20	432.n	N/A	N/A	N/A
Other regulations to protect natural floodplain functions not specifically listed in the Coordinator's Manual	20	432.o	NO	0/100	YES
450 (Stormwater Management)					
Requiring new developments in the watershed to account for the total volume of runoff released (SMR-DS)	21	452.a(2)	YES	225/225	YES
Requiring new developments to use low impact development techniques (SMR-LID)	21	452.a(3)	NO	0/25	YES
Setting stormwater management standards based on an overall plan for the watershed (WMP)	21	453.b	YES	63/315	YES
510 (Floodplain Management Planning)					
Adopting one or more plans that address protecting natural floodplain functions (NFP)	23	512.c	NO	0/100	YES
540 (Drainage System Maintenance)					
Having a habitat-friendly program to clear debris in drainageways (CDR)	27	542.a	YES	198/200	YES

Table 3: Community Rating System Credited Conservation and Recovery Actions

1. Page numbers refer to CRS Credit for Habitat Protection.
2. This column lists the section(s) of the CRS Coordinator's Manual in which more information can be found.
3. These elements are appropriate only for species dependent on beaches, such as sea turtles and shore birds.
4. Credits were derived from detailed results from previous verification visits and most recent results from the 2023 Class 3 CRS Cycle Visit, which include sum totals for each activity category. Some assumptions were made without detailed results from the ISO office (no longer provided to communities).

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Appendix A: Species Profiles

Upper Willamette River Chinook Salmon (*Oncorhynchus tshawytscha*)



Description

The Chinook salmon (*Oncorhynchus tshawytscha*) is the largest and most valuable species of Pacific salmon. Its common name is derived from the Chinookan peoples. Other vernacular names for the species include king salmon, Quinnot salmon, Tsumen, spring salmon, chrome hog, Blackmouth, and Tyee salmon. Chinook salmon are the largest Pacific salmon species and, on average, grow to be three feet (0.9 meters) long and approximately 30 pounds (13 kilograms). However, some Chinook salmon can reach more than five feet (1.5 meters) long and 110 pounds (50 kilograms). The salmon are blue-green on the head and back and silver on the sides. The fish's tail, back, and upper fin have irregular black spots, and black markings also are present around the gums. Male Chinook salmon have a distinctive hooked nose at the top of the mouth and a ridged back. During the mating season, both male and female salmon develop a reddish tint around their back fins and tail.

Life cycle

As anadromous fish, salmon live in streams that drain to the ocean. The Willamette River drains to the Columbia in the Portland area and then connects to the Pacific Ocean at the mouth as Astoria. Chinook salmon lay their eggs and spend their first few months in fresh water. In less than a year, they migrate to saltwater where they spend most of their lives. They come back to the streams they were born in to lay their eggs and die. The Upper Willamette River (UWR) Chinook (*Oncorhynchus tshawytscha*) Evolutionarily Significant Unit (ESU) includes all naturally spawned populations of spring Chinook salmon in the Clackamas River and in the Willamette Basin upstream of Willamette Falls.

ODFW sampling and tagging data are starting to indicate that most fry and fingerling rear in the lower reaches of spawning tributaries and in the Willamette River mainstem in late winter and early spring (Schroeder et al. 2005, 2007). Some fish grow quickly in this area and migrate as subyearling

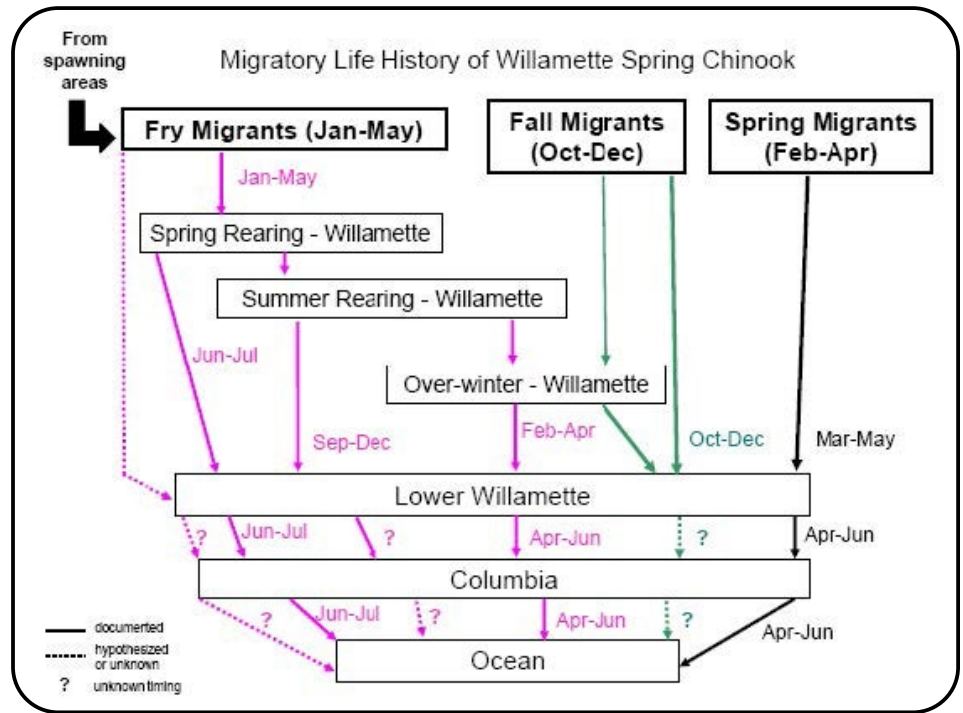


Illustration of variation in outmigration timing and use of different river regimes of Upper Willamette River Spring Chinook Salmon (modified from Schroeder et al., 2016)

smolts out of the Willamette River basin, probably beginning in early to mid-May for the larger fish and continuing into mid-July in most years.

Habitat

Chinook salmon needs colder water with stable stream channels, clean spawning and rearing gravel, diverse cover, and unblocked migratory corridors. Because of their large body size, Chinook generally prefer to spawn in mainstems with higher water flows and deep holding pools and are able to spawn in larger gravel than most other salmon. The Willamette River in the Salem area is dominantly in the area for upriver migration of adult spawning fish and downriver migration of juvenile fish. Habitat use by juvenile Chinook salmon undergoes a seasonal shift that was likely driven by the increasing size of fish over time. Juvenile Chinook salmon were only observed in 7 percent of the alcove habitats sampled compared to approximately 40 percent of the main channel and side channel habitats.

Threats

The factors threatening naturally spawned Chinook salmon throughout its range are numerous and varied. The present depressed condition is the result of several long-standing, human induced factors (e.g., habitat degradation, water diversions, harvest, and artificial propagation) that serve to exacerbate the adverse effects of natural environmental variability from such factors as drought. In the Salem area floodplain development that adds to impervious surface cover can have detrimental impacts to a wide range of aquatic species including Chinook salmon. Actions taken to reduce or minimize impervious surface cover and reduce stormwater runoff and pollutants can include: preservation of areas as “open space”, sustainable or “green” development practices that incorporate nature based solutions, and conversion of impervious to pervious (porous) surfaces.

Access to historical spawning and rearing areas is restricted by large dams in the four historically most productive tributaries, and in the absence of effective passage programs will continue to

be confined to more lowland reaches where land development, water temperatures, and water quality may be limiting. Pre-spawning mortality levels are generally high in the lower tributary reaches where water temperatures and fish densities are generally the highest. Areas immediately downstream of high head dams may also be subject to high levels of total dissolved gas (TDG). Given current climatic conditions and the prospect of long-term climatic change, the inability of many populations to access historical headwater spawning and rearing areas may put this ESU at greater risk in the near future.

ESA Listing Status

Threatened on March 24, 1999 (64 FR 14308) and June 28, 2005 (70 FR 37159); updated April 14, 2014 (79 FR 20802)

Critical Habitat

Designated September 2, 2005 The designation of critical habitat includes stream reaches up to the two-year flood elevation. In the Willamette River that covers a significant portion of the floodplain.

Protective Regulations

Issued June 28, 2005 (70 FR 37159)

Recovery Plan

Upper Willamette River Chinook and Steelhead Conservation & Recovery Plan (2011)

Habitat use in Salem Area

With their complex life history strategies, juvenile Chinook salmon are likely to be found in the mid-Willamette area any time of the year under any flow conditions. Juvenile fish typically move downstream along the edge of the river, avoiding the main flow, thus occupying fringe habitats in the floodplain.

Upper Willamette River Steelhead (*Oncorhynchus mykiss*)



Description

Steelhead and rainbow trout are the same species, but rainbow are freshwater only, and steelhead are anadromous, or go to sea. Unlike most salmon, steelhead can survive spawning, and can spawn in multiple years. Steelhead can weigh 30 pounds or more, but average between 8 and 11 pounds. The body of the steelhead trout is silvery and streamlined with a rounder head. This silver color and round head is what gives the steelhead its name. There are black dots that are more concentrated on the back of the fish and become sparser closer to the lateral line of the fish. Steelhead also develop a pink horizontal stripe. When steelhead return to freshwater to spawn, their color begins to more closely resemble that of a normal rainbow trout.

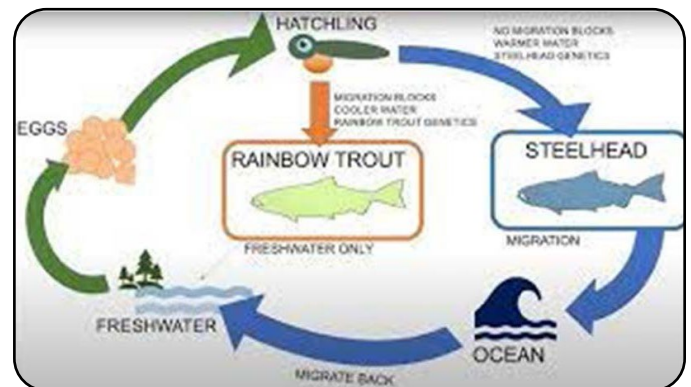
Life Cycle

Steelhead can spend from 1 to 4 years in the ocean before traveling to their spawning grounds. There are two general types of steelhead runs, named for the season when most of the fish run return from the ocean: winter and summer.

Winter-run Steelhead return from the ocean at age 4 or 5 years, and travel to their spawning grounds from November to April. Winter-run steelhead are very mature fish and begin spawning soon after they arrive.

Summer-run Steelhead usually return from the ocean at age 3 and migrate to their spawning grounds from April to September. The summer-run steelhead are typically immature fish and need several months of maturing in the freshwater before spawning. Both steelhead stocks spawn from winter to early spring (January to April). The lifespan of steelhead varies from 5 up to 11 years.

Steelhead are different from Pacific salmon because steelhead do not all die once they spawn. Steelhead can survive after spawning and can migrate to the ocean and back to their spawning grounds again in the future, laying eggs more than once in their lifespan. The seasonal differences in steelhead migrations and multiple trips to spawning grounds are considered when predictions are made about the number of returning steelhead for the season and their fisheries management.



Habitat

The listed population includes naturally spawned anadromous winter-run steelhead originating below natural and manmade impassable barriers from the Willamette River and its tributaries upstream of Willamette Falls, to and including the Calapooia River.

Threats

Like the threats to Chinook salmon, steelhead are affected by historic land use change, dam and diversion construction, stream simplification, bank hardening, riparian forest cutting and other factors

affecting the stream environment. Like Chinook salmon, steelhead are likely affected by impervious surface development and loss of riparian habitats from urban development in the Salem area.

ESA Listing Status

Threatened on March 25, 1999 (64 FR 14517) and January 5, 2006 (71 FR 833); updated April 14, 2014 (79 FR 20802)

Critical Habitat

Designated September 2, 2005

Protective Regulations

Issued June 28, 2005 (70 FR 37159)

Recovery Plan

Upper Willamette River Chinook Salmon and Steelhead Conservation and Recovery Plan (2011) includes the recommendations to:

1. Implement the suite of Willamette basin TMDL water quality actions, rural and urban best management practices (BMPs), and other land use actions to address multiple (and somewhat related) limiting factors. Actions include:
 - Willamette basin temperature TMDL Water Quality Management Plan actions that increase the amount of riparian vegetation to improve shade function of riparian zones.
 - Strengthen and implement BMPs that reduce nonpoint sourcing of inputs and runoff of agricultural and urban chemicals (pesticides).
 - Willamette basin pesticide and nutrient TMDL Water Quality Management Plan actions that reduce point and non-point sourcing of runoff from urban, industrial, rural, and agricultural practices.
2. Implement the suite of Willamette Project BiOp flow actions to address multiple (and somewhat related) limiting factors. Actions include:
 - Promote incentives to private landowners to protect intact riparian areas, floodplains, and high-quality off-channel habitats that are not covered by actions in other plans and restore areas that are degraded.
 - Willamette Project BiOp revetment modification/reduction and habitat restoration actions that improve the amount, complexity, diversity, and connectivity of riparian, confluence, and off-channel habitats.
 - Willamette Project BiOp flow actions that increase the occurrence of peak flows that maintain and create habitat, thereby contributing to increased channel complexity and habitat diversity.
 - Willamette Project BiOp flow actions to meet salmon and steelhead rearing and migration flow targets in the mainstem Willamette River.

Habitat use in Salem Area

Steelhead juveniles use similar habitats to Chinook and use the floodplain during high water periods. Steelhead have been documented in lower Glenn Creek and Mill Creek as well as the Willamette floodplain.

Streaked Horned Lark (*Eremophila alpestris strigata*)



Description

The streaked horned lark is a slender, long-winged passerine about 7 inches long. Adults are marked with a dark facial mask and breast band that contrasts with a pale face and throat. These features are especially clear and distinctive in adult males, which have a yellow throat. The “horns” for which the species is named are tiny, black feather tufts on the sides of the head in adult males. Adult females are similar to males, but duller, smaller, and lack horns.

Life Cycle

Streaked horned larks forage on the ground in bare fields or among short vegetation. They eat seeds and grass but feed their young insects, exclusively. Streaked horned larks nest on the ground, where a clutch of three to five eggs is placed next to a tuft of vegetation or a small object. They may rear two to three broods per season. Nest building in southern Puget Sound generally begins in mid-April to early May, and concludes by mid-August. Nomadic in the fall and winter, streaked horned lark form territories when breeding. Eggs are greenish or grayish with brown speckles. Larks typically lay four or five eggs which are incubated 11 days; young are able to fly 9 to 12 days after they hatch. Like meadowlarks and grasshopper sparrows, the species prefers large patches of contiguous grassland habitat in the landscape.”

Habitat

The largest area of potential habitat for streaked horned larks is the agricultural land base in the Willamette Valley. Larks are attracted to the wide, open landscape context and low vegetation structure in agricultural fields, especially in grass seed fields, probably because those working landscapes resemble the historical habitats formerly used by the subspecies when the historical disturbances associated with floods and fires maintained a mosaic of suitable habitats. In any year, some portion of the 920,000 ac (372,311 ha) of agricultural lands in the Willamette Valley will contain patches of suitable streaked horned lark habitat, but the geographic location of those areas may not be consistent from year to year, nor can their occurrence due to variable agricultural practices (crop rotation, fallow fields, etc.), and the changing and dynamic locations of those areas be predicted.

Threats

The primary driver of the status of streaked horned lark has been the scarcity of large, open spaces with very early seral stage plant communities with low-statured vegetation and substantive amounts of bare or sparsely vegetated ground. Historically, the lark’s habitat was maintained by disturbances such as flooding or fire. The loss of these natural cycles has made them depend on artificially maintained habitats, including agricultural lands, airports and dredged material placement sites. Other factors contributing to the bird’s decline are its small population size, and recreational and land management activities that disturb the bird during nesting. Unfortunately, because they nest in vulnerable locations, their nests are often accidentally destroyed by farm machinery, ATVs and traffic.

ESA Listing Status

Threatened on October 3, 2013, 78 FR 61451 61503,
April 13, 2022. 87 FR 21783 21812

Critical Habitat

October 3, 2013 78 FR 61505 61589

Critical habitat includes the following “primary constituent elements”:

“The primary constituent elements specific to the streaked horned lark are areas having a minimum of 16 percent bare ground that have sparse, low-stature vegetation composed primarily of grasses and forbs less than 13 in (33 cm) in height found in:

- (1) Large (300-ac (120-ha)), flat (0–5 percent slope) areas within a landscape context that provides visual access to open areas such as open water or fields, or
- (2) Areas smaller than described in (1), but that provide visual access to open areas such as open water or fields.”

Recovery Plan

October 30, 2019, 84 FR 58170 58171

Habitat use in Salem Area

Streaked horned larks have been identified in the Salem floodplain. Locations in the Mill Creek floodplain have been documented. Habitat at the Salem airport has supported larks historically, but the airport population is now considered extirpated.



Northwestern Pond Turtle (*Actinemys marmorata*)



Photo Credit: Keith Kohl

Species Description

The northwestern pond turtle is a mid-sized, semi-aquatic freshwater turtle and is one of Oregon's two native turtle species. They have a smooth, broad carapace (upper shell) that is drab brown to olive in color and low in profile. The plastron (lower shell) is typically light yellow in color, sometimes with a variable number of darker blotches. Their head and limbs are variable in color, typically gray to black with yellow speckling. Males have a lighter colored chin and throat than females, and a longer, thicker tail than females. Adults may grow up to ten inches in length. They are usually seen basking on rocks or floating logs or vegetation in slow-moving bodies of water.

Similar species in Oregon are the western painted turtle and the red-eared slider (a non-native species). All three species can sometimes be found in the same bodies of water, or even on the same log. From a distance, all three species can look similar. Red-eared sliders and western painted turtles are more vibrantly marked than northwestern pond turtles. It may be difficult to distinguish between native northwestern pond turtles and older red-eared sliders whose red markings have faded. A key characteristic to focus on is the shape of marginal scutes (plates that make up the shell); red-eared sliders have serrated marginal scutes above their tail, while northwestern pond turtles' are smooth.

Range and Distribution

The range of the northwestern pond turtle is primarily west of the Sierra Nevada and Cascade Mountains, stretching from Puget Sound, Washington to Baja California, at elevations ranging from sea level to about 5,000 ft. There are small populations that persist in watersheds east of the Sierra Nevada and Cascade Mountains.

In Oregon, they primarily are found west of the Cascades at elevations lower than 6,000 feet. The largest populations are located in the drainages of the Willamette, Umpqua, Rogue, and Klamath Rivers, but smaller populations are scattered throughout lowland aquatic habitats of western Oregon and the east Cascades.

Habitat Characteristics

Northwestern pond turtles are closely associated with aquatic habitat with muddy bottoms and available basking sites. They are most common in still or slow-moving water, particularly around dense vegetation, which provides a high density of invertebrate prey. Submergent and emergent aquatic vegetation are important habitat components that provide safe nursery habitat for young turtles with plenty of food and cover. Underwater refugia such as submerged logs and cut banks provide protection from underwater predators.

Overwintering sites are along stream banks, and nesting sites are typically within 200 yards of water in areas with little vegetation and plenty of sunlight. Nesting sites are in sparse vegetation with sandy, silt, or gravel soils, and good solar exposure.



Diet and Foraging

Northwestern pond turtles are omnivores and dietary generalists, with a variable diet that consists mainly of aquatic invertebrates and larvae, as well as some plants, small fish, frogs, and carrion. They are opportunistic feeders, and forage exclusively in water. They have sharp ridges on their jaws that help them tear their food.

Life History and Ecology

Northwestern pond turtles are a long-lived species that mature slowly. Individuals have been recorded living over 40 years. They have a low reproductive rate and delayed sexual maturity. Male northwestern pond turtles typically reach reproductive maturity at five to nine years, while females reach reproductive maturity after seven to ten years.

In Oregon, the nesting season occurs from May through mid-July. Breeding takes place underwater and occurs from late spring to mid-summer. When female turtles are ready to lay their eggs, they fill their bladder with water and emerge from the water to find a suitable nesting spot. Suitable sites are found near their aquatic habitat in areas with sparse vegetation and good solar exposure. Once they select a site, they empty their bladder on the soil and dig with their back legs to create a shallow nesting cavity where they will deposit their eggs. Clutches have been recorded with one to thirteen eggs, with an average of six eggs per clutch. Multiple clutches can be laid in a season. After depositing their eggs, they use the moist soil to create a nest plug which they use to seal their eggs into the chamber for incubation. Eggs receive no parental care, and nests are vulnerable to predation. After the eggs hatch in fall, the young may overwinter in the safety of the nests.

Northwestern pond turtles bask on floating logs, vegetation, or on muddy stream banks to maintain body temperature. Like most reptiles, they rely on the environment to maintain their body temperature (they are ectothermic, or “cold-blooded”). During the winter when it is cool and their metabolism slows down, they become semi-dormant and will overwinter in moist terrestrial and aquatic habitats. They bury themselves in mud, under stream banks, or in leaf litter. In warm weather, they will come out to bask or move to different locations.

They are primarily aquatic, but may move overland when ephemeral waterbodies dry up, to find nesting habitat, and to seek out sites for overwintering. They are not territorial, and often are found sharing basking surfaces with turtles from the same species as well as other species. Home range size for individuals is highly variable, and depends on the size of the aquatic system. They are capable of long distance seasonal movements between aquatic and terrestrial habitats, and long distance dispersal. Overland distance between aquatic and terrestrial habitat can be more than one mile.

Predators of northwestern pond turtles include raccoons, otters, ospreys, coyotes. Hatchlings are eaten by a variety of predators, including corvids, American bullfrogs, weasels, and large fish.

Fun Facts

- If they run out of basking sites on logs or rocks, northwestern pond turtles sometimes conserve warmth by stacking on top of one another.
- Hatchlings are only about the size of a quarter, making them very vulnerable to predators for the first few years of their lives.
- Similar to a fingerprint, turtles have a unique pattern on their plastron that can be used to identify unique individuals.
- At the first sign of danger, basking turtles will dive for cover under water. When threatened, pond turtles can retract their head and legs into the protection of their hard shell

Conservation

Northwestern pond turtles are an Oregon Conservation Strategy Species (Species of Greatest Conservation Need), a state Sensitive Species, and a Federal Species of Concern. Factors influencing northwestern pond turtle populations include loss or alteration of habitat, increased predation of nests and hatchlings from historical levels, invasive species, and road mortality. Introduced species, including bullfrogs and smallmouth bass, predate young turtles. Released pet turtles are a threat to native species because they compete for limited resources and can transmit diseases.

During the breeding season, be on the lookout for turtles crossing the road. If you choose to help a turtle cross the road, be sure to bring it in the direction of travel and leave it on the side of the road; females are driven to get to nesting habitat and deposit their eggs, and they know where they want to go! Wash your hands after you handle any turtles. Otherwise, don't disturb turtles when you see them.

Many of Oregon's northwestern pond turtle populations occur on private land. If you have northwestern pond turtles or their habitat in your backyard, you can take simple steps to enhance the habitat to encourage more turtles to make their home there. You can create basking habitat in waterbodies by putting out logs or branches, remove invasive plants around ponds, and create sunny places.

For more information about the conservation status of northwestern pond turtles including special needs, limiting factors, data gaps, and conservation actions, refer to the Oregon Conservation Strategy.

Willamette daisy (*Erigeron decumbens*)

ENDANGERED



Flowers (left), habit (center), and habitat (right) of Willamette daisy. Photos by Melissa Carr (left and right) and ODA staff (center). If downloading images from this website, please credit the photographer.

Family

Asteraceae

Taxonomic notes

Synonyms: *Erigeron decumbens* var. *decumbens**

*This taxon was formerly recognized as variety *decumbens*. Recent treatment of the genus in *Flora of North America North of Mexico* elevated the other variety of *E. decumbens* (var. *robustior*) to species rank, and consequently, there is no longer need to recognize Willamette daisy at the varietal level.

Plant description

Willamette daisy is a tap-rooted perennial species growing from a crown or slightly branched caudex. Stems are decumbent, moderately strigose, 15-70 cm tall, and often purplish at the base. The leaves are numerous, sparsely to moderately strigose, linear or linear-lanceolate, the basal leaves and most of the cauline leaves triple-nerved. Basal leaves are up to 25 cm long, including the long petiole, and 1 cm wide, with cauline leaves becoming gradually reduced above. Flowering heads number from 1-20, the disk 0.8-1.5 cm wide, the involucre 0.35-0.6 cm high, and the 20-50 blue-purple to pale pink ray flowers 0.6-1.2 cm long by 0.1-0.2 cm wide. The pappus consists of 12-16 fragile bristles.

Distinguishing characteristics

Willamette daisy is the only species of *Erigeron* with pink-purple rays that occurs in Willamette Valley prairies. It is further distinguished by its gradually reduced cauline leaves, triple-nerved basal leaves, and decumbent, spreading habit. *Erigeron eatonii* is morphologically similar, but occurs east of the Cascade Mountains. *Symphotrichum hallii* co-occurs with Willamette daisy at many sites, but its rays are usually white (although sometimes pale violet), it flowers later in the summer (July to August), and it is more branched than Willamette daisy. Small vegetative individuals of these two species are very similar, but are distinguishable based on stem color: *S. hallii* typically

has reddish stems, while Willamette daisy has green stems.

When to survey

Surveys for this species should be conducted when the plants are flowering, from June through early July.

Habitat

Willamette daisy inhabits both seasonally flooded bottomland prairies and well-drained upland prairies at elevations ranging from 70-290 m (240-950 ft).

Commonly associated species include *Achillea millefolium*, *Allium amplexans*, *Anthoxanthum odoratum*, *Brodiaea hyacinthina*, *Bromus carinatus*, *B. japonicus*, *Carex* spp., *Camassia leichtlinii*, *Crataegus douglasii*, *Danthonia californica*, *Deschampsia caespitosa*, *Elymus glaucus*, *Eriophyllum lanatum*, *Festuca arundinacea*, *F. roemerii*, *Fragaria virginiana*, *Fraxinus latifolia*, *Grindelia integrifolia*, *Holcus lanatus*, *Juncus* spp., *Lomatium bradshawii*, *Panicum occidentale*, *Poa nevadensis*, *Potentilla gracilis*, *Prunella vulgaris*, *Quercus garryana*, *Ranunculus occidentalis*, *Rosa* spp., *Saxifraga integrifolia*, *Sericocarpus rigidus*, *Sidalcea campestris*, *Spiraea douglasii*, and *Symphotrichum hallii*.

Range

Willamette daisy is known only from the Willamette Valley in northwestern Oregon. Though once found throughout the valley, the species is now restricted to scattered habitat remnants. Historic populations in Clackamas, Washington, and Yamhill Counties have not been relocated, and the species may no longer occur in these counties. The majority of extant populations are located on private lands vulnerable to development.

Oregon counties

Benton, Clackamas, Lane, Linn, Marion, Polk, Washington, Yamhill

Federal status

Endangered

Threats

Habitat loss due to urban and agricultural development is the primary threat to this species. Successional encroachment by trees and shrubs, competition from invasive weeds, and possible inbreeding depression due to small population sizes also pose serious threats to Willamette daisy. Road construction and maintenance and grazing pose additional risks.

Conservation planning

A [Critical Habitat Designation](#) (pdf document, 2.60 MB) for Willamette Daisy was issued by the U.S. Fish and Wildlife Service in 2006.

A U.S. Fish and Wildlife Service [Recovery Plan for prairie species of western Oregon and southwestern Washington](#) (pdf document, 9.63 MB) was released in 2010 and addresses conservation needs of Willamette daisy.

Did you know?

From 1840 (when Willamette daisy was first described) to 1934, this species was collected from throughout the Willamette Valley. However, it was not observed for decades after this period and was thought to be extinct until its rediscovery in 1980 at two locations in Lane and Benton counties.

Current/Recent ODA projects

Developing population density estimates for nine rare Willamette Valley prairie species

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Peacock larkspur (*Delphinium pavonaceum*)

ENDANGERED



Flowers (left), habit (center), and habitat (right) of peacock larkspur. Photos by Melissa Carr. If downloading images from this website, please credit the photographer.

Family

Ranunculaceae

Taxonomic notes

The *Flora of North America North of Mexico* treats peacock larkspur as a hybrid between *Delphinium menziesii* ssp. *pallidum* and *D. trolliifolium*. However, based on its unique morphology and fertile, self-sustaining populations, peacock larkspur is treated here as a distinct species (*D. pavonaceum*), following the Oregon Flora Project treatment of the taxon.

Peacock larkspur has been reported to produce viable hybrid seeds when crossed with *Delphinium leucophaeum*, *D. menziesii*, *D. oregonum*, and *D. nuttallii*.

Plant description

Peacock larkspur is a leafy perennial 30-90 cm tall that grows from a cluster of globose tubers. The deeply cleft leaves are mostly cauline, becoming bract-like above, the lowest leaves with petioles up to 22 cm long. Flowers are arranged in a pyramidal raceme, with lower pedicels much longer than the upper ones. The sepals are white to cream, sometimes slightly greenish blue on the back and greenish at the tip, and more or less reflexed to spreading. The lower petals are white or faintly bluish tinged toward the base and glandular-pubescent with a hairy tuft at the base of the blade. The upper petals are bluish to lavender-tipped. The follicles are up to 1.6 cm long and often glandular-pubescent.

Distinguishing characteristics

Peacock larkspur is distinguished from *Delphinium leucophaeum*, the only other white-flowered larkspur west of the Cascades, by its taller habit (30-90 cm versus 20-60 cm in *D. leucophaeum*), its larger flower parts (lateral sepals 12-18 mm long versus 9-14 mm in *D. leucophaeum*, spur 14-20 mm long versus 10-14 mm), its reflexed to spreading sepals (versus cupped forward in *D. leucophaeum*), pyramidal raceme (versus narrow), and lower petals that are usually glandular with a hairy tuft at the base (versus non-glandular and long-hairy over the entire surface). Peacock larkspur is

also very similar to *D. menziesii*, but the white sepals of the former species readily distinguish it from its blue-sepaled congener.

When to survey

Surveys for peacock larkspur should be completed from late April through June when the species is flowering and is distinguishable from other delphiniums.

Habitat

Peacock larkspur inhabits low, nearly flat areas in moist, silty soils of the Willamette River floodplain at elevations ranging from 45-120 m (150-400 ft). It occurs in native wet prairies, on the edges of ash and oak woodlands, and along roadsides and fence rows.

Associated species include *Achillea millefolium*, *Alepocuris pratensis*, *Allium amplexans*, *Camassia quamash*, *Delphinium menziesii*, *Deschampsia caespitosa*, *Fraxinus latifolia*, *Geum macrophyllum*, *Geranium oreganum*, *Holcus lanatus*, *Hypericum perforatum*, *Lomatium bradshawii*, *L. utriculatum*, *Lupinus polyphyllus*, *Phlox gracilis*, *Plectritis congesta*, *Poa pratensis*, *Potentilla gracilis*, *Quercus garryana*, *Rosa* spp., *Sidalcea* spp., *Symphoricarpos albus*, *Toxicodendron diversilobum*, *Vicia* sp., and *Wyethia angustifolia*.

Range

Peacock larkspur is a localized endemic restricted to the middle Willamette Valley of Oregon. The species is found primarily within Benton and Polk counties, its largest occurrences located at William L. Finley National Wildlife Refuge in Benton County.

Oregon counties

Benton, Clackamas, Lane, Marion, Multnomah, Polk

Federal status

Species of Concern

Threats

A major threat to peacock larkspur is habitat loss due to urban expansion and agricultural development. Road maintenance and herbicide application from adjacent agricultural fields pose significant threats, as well. In addition, habitat degradation due to weed invasions and successional encroachment of shrubs negatively impact this species. Herbivory of peacock larkspur by rodents, deer, and slugs has been documented, and hybridization with other *Delphinium* species (especially *D. menziesii*) poses a potential threat to the genetic integrity of peacock larkspur.

Conservation planning

A U.S. Fish and Wildlife Service [Recovery Plan for prairie species of western Oregon and southwestern Washington](#) (pdf document, 9.63 MB) was released in 2010 and addresses conservation needs of peacock larkspur.

Did you know?

Scientists have hypothesized that peacock larkspur evolved in the wake of the Pleistocene epoch floods of the Columbia River (the Bretz Floods) that occurred between 12,800 and 15,000 years ago. These floods scoured the north end of the Willamette Valley and created a temporary lake that extended south to the present-day city of Eugene. The lake repeatedly filled and drained, creating massive habitat disturbance and laying new deposits of silt and gravel in the valley. New forms of *Delphinium* were likely produced through hybridization and/or mutation in these

disturbed areas and evolved into our localized Willamette Valley larkspur endemic species. Peacock larkspur appears to have derived from *D. menziesii*.

Current/Recent ODA projects

Developing population density estimates for nine rare Willamette Valley prairie species

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