2020

Clackamas River Invasive Species Partnership: Annual Report

Activities and accomplishments of the Clackamas River Invasive Species Partnership to prioritize and manage invasive species and associated restoration efforts in the Clackamas River Basin

CRISP

Clackamas River Invasive Species Partnership

Acknowledgements

This annual report has been developed on behalf of the *Clackamas River Invasive Species Partnership* (CRISP). In 2020, the collective efforts of CRISP and its participating organizations have continued to make meaningful progress toward protecting the Clackamas River Basin from the ongoing threat of invasive species. The CRISP would like to acknowledge the many contributions of its participating and funding organizations, as well as the efforts of their dedicated personnel. These efforts have helped to ensure the success of the Clackamas River Invasive Species Partnership. Thank You!

Participating Organizations

- *4-County Cooperative Weed Management Area*
- *Bureau of Land Management- Northwest Oregon District*
- *Clackamas County Parks*
- *Clackamas County Water Environment Services*
- *Clackamas River Basin Council*
- *Clackamas Soil and Water Conservation District*
- *Columbia Land Trust*
- *Metro*
- *Natural Resources Conservation Service- Clackamas*
- *North Clackamas Parks and Recreation District*
- *Oregon Department of Agriculture- Noxious Weed Program*
- *Oregon Parks and Recreation Department*
- *Portland General Electric*
- *United States Forest Service- Mt. Hood National Forest*

Funding Organizations

The following organizations have supplied cash or documented in-kind contributions to support CRISP and implementation of the *Clackamas River Invasive Species Management Plan* in 2020. The CRISP partners greatly appreciate the generous support of these organizations.

- *Bureau of Land Management- Northwest Oregon District*
- *Clackamas River Basin Council*
- *Clackamas Soil and Water Conservation District*
- *Metro*
- *Portland General Electric*
- *United States Forest Service- Mt. Hood National Forest*

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Executive Summary

Our Story

The Clackamas River Invasive Species Partnership (CRISP) was formed in response to the steady expansion of invasive species within the Clackamas River Basin. These invasive species degrade our natural areas and greenspaces, diminish the quality of our streams and rivers, decrease the viability of our working lands, and reduce the livability of our communities.

In an effort to mitigate the impact of invasive weeds, the CRISP partnering organizations have been working diligently to build upon our prior success to enhance our management practices through improved coordination. The collaborative approach undertaken by the CRISP focuses on working more cohesively across property lines and jurisdictional boundaries to reduce gaps in management. Through this approach, the CRISP seeks to improve effectiveness by focusing on priority weed infestations that pose the greatest threat to the watershed.

Working Better and Together

In spite of the difficulties due to Covid-19 and devastating wildfires in2020, the CRISP continued its efforts to increase cooperative management approaches outlined in our *Clackamas River Invasive Species Management Plan*. These collaborative efforts allow the CRISP to utilize the unique strengths and expertise of our partnering organizations to improve conditions across the Basin.

In the upper portions of the Clackamas River Basin, CRISP partners have continued to work collaboratively. The United States Forest Service, Oregon Department of Agriculture, Portland General Electric, and Clackamas Soil and Water Conservation District have been working collectively to systematically survey and treat high priority noxious weeds. Partners continued the concerted effort to survey areas with a high potential for the introduction of new invasive weeds, resulting in the detection of several new high-priority weed infestations.

Along the lower portions of the Clackamas River Basin, CRISP partners have increased coordination and are managing weeds from Milo McIver State Park to the confluence with the Willamette, including several of the Clackamas tributaries. In particular, CRISP partners have worked to coordinate treatments on private and public land to increase connectivity of actively managed properties. This has helped to raise public awareness about the CRISP efforts as well as bolster existing efforts in our open spaces and natural areas.

Making the Investment

CRISP partners have continued to support active weed control efforts in the Clackamas River Basin through an ongoing investment in time and resources. The CRISP has continued to utilize significant grant funds from the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* to support implementation. These funds have been a great asset and have allowed the CRISP to address gaps in active management and to offset shortfalls in current weed control efforts.

CRISP partnering organizations have also invested significant cash and in-kind contributions over the last year. In total, the CRISP partners reported expending $691,816[1] in contracted weed control and restoration services in 2020. The total estimated CRISP-related personnel services reported by partners in 2020 totaled 2113[2] hours. This work supported weed surveys and treatments on over 3649 acres of public and private land[3].

With many of the gaps in management occurring on private lands, CRISP partners continued outreach efforts to private landowners to increase management of priority weeds. In 2020, CRISP partners sent 189 letters to landowners inviting participation in CRISP-related weed survey and treatment activities.[4]

Growing the Partnership

After adoption of the CRISP *Memorandum of Understanding* (MOU) in 2016, 14 partner organizations have continued to refine and develop how we collaborate. There is a sustained interest in our activities, which demonstrates the momentum and vitality of the partnership and the ongoing commitment of its member organizations to improve invasive weed management in the Clackamas River Basin.

The addition of a CRISP-dedicated staff person in December of 2016 has also helped to enhance implementation and coordination amongst partners. This position is housed within the CSWCD's WeedWise program and has assisted with implementation of CRISP-related activities. The CRISP specialist supports activities between partners and has been spearheading implementation of weed control projects throughout the watershed.

Looking Ahead

The past year has proven to be another highly productive year for the CRISP. Activities initiated early in the partnership have informed and influenced our ongoing activities and we continue to refine our coordination, priorities, and methods. The grant funding and partner support along with the ongoing commitment of dedicated staff and contractors will allow CRISP to continue to address existing resource limitations and management gaps. In 2021, we look forward to continuing to build upon our accomplishments in supporting a healthier Clackamas River Basin.

Background

The Clackamas River Invasive Species Partnership (CRISP) was formed in 2014 through a collaborative effort by the Clackamas River Basin Council, the Clackamas Soil and Water Conservation District, and Metro to develop the *Clackamas River Invasive Species Management Plan* to prioritize and improve the management of invasive species and associated restoration efforts in the Clackamas River Basin. In

[1] This number accounts for all resources reported by CRBC, CSWCD, NRCS, Metro, and USFS, as well as approved CRISP projects (which were funded by the PGE Clackamas Fund and cash matches from BLM, CSWCD, Metro, and the USFS)

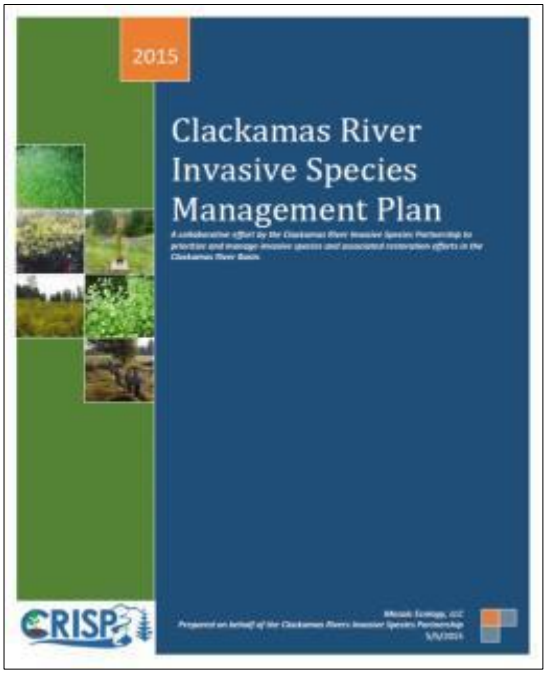
[2] This number accounts for hours reported by CLT, CSWCD, Metro, and OPRD, and includes hours for the CRISP coordinator.

[3] This number accounts for surveys and weed treatments reported by CRBC, CSWCD, CLT, Metro, NCPRD, NRCS, OPRD, PGE, USFS, & WES.

[4] These numbers account for letters sent by CRBC and CSWCD.

developing the plan, the CRISP partners convened an advisory group—comprised of a diverse group of land managers—to better inform the plan development process.

Upon completion of the *Clackamas River Invasive Species Management Plan* in 2015, participating organizations formed the broader CRISP to support implementation of the management plan. Since that time, the CRISP has grown to include 14 partnering organizations, representing broad interests across the Clackamas River Basin. Through the adoption of the *Clackamas River Invasive Species Management Plan*, the CRISP established the following goals to guide partnership efforts:



The Clackamas River Invasive Species Management Plan was completed in 2015.

- Develop and maintain a coalition of federal, state, regional, and local partners to prioritize and coordinate invasive plant control and revegetation efforts throughout the basin.
- Secure new and sustainable sources of funding to implement and maintain these efforts.
- Align local and regional policies to support implementation of plan goals.
- Promote recognition among public and private landowners within the basin of the need to actively manage invasive plants and enhance natural areas.
- Identify and prioritize sub-watersheds, natural areas, and important habitats for protection and enhancement.
- Develop an invasive plant treatment strategy that identifies and prioritizes specific invasive species management actions through the consolidation of existing efforts and resources.
- Prevent the introduction and spread of new invasive species, reduce the distribution and cover of priority invasive species, and restore priority natural areas currently infested with common, priority, or new invasive species.
- Outline a strategy to use limited resources to accomplish measurable, impactful, and lasting improvements within the basin.

The *Clackamas River Invasive Species Management Plan* defines a long-term, basin-wide framework for controlling invasive species as well as a short-term strategy that is intended to help focus limited resources on the geographies and initiatives where they can have the greatest impact. The plan is intended to be iterative, and will be adapted and adjusted to changing priorities, partner composition, and conditions within the Clackamas River Basin.

This report documents the approach, activities, and accomplishments of both the partnership and individual participating organizations and demonstrates the breadth of invasive species management underway within the Clackamas River Basin.

Overview of the Clackamas River Basin

The 600,700-acre Clackamas River Basin is made up of 72 percent publicly owned land, 3 percent tribally owned land, and 25 percent privately owned land. The Clackamas River flows 82 miles from its headwaters in the Mt. Hood National Forest to its confluence with the Willamette River just downstream of Willamette Falls in Oregon City, OR. The river descends from an elevation of 6,000 feet down to just 12 feet at its confluence. The basin provides water to more than 300,000 people and contains six dams that provide electricity, water storage, and flood control.

Location of the Clackamas River Basin in Oregon

Invasive Species

The biological condition and land use practices within the Clackamas River Basin have been altered significantly from historical conditions. Activities such as forest clearing, field burning, cultivation, and urban and rural development have intensified land management in the basin. Today, one of the most noticeable ecological side effects of these land uses is the reduced abundance of native species and the increased abundance of invasive species.

The CRISP defines invasive species as non-native species with aggressive growth habits that allow them to spread quickly and cause harm to the social, economic, and ecological resources of our communities. In general, those areas in the basin that have seen more intensive land management and manipulation have a greater diversity and abundance of invasive species. Over time, invasive species can simplify plant communities, replacing complex assemblages of native trees, shrubs, and herbaceous plants with lower diversity, largely non-native communities. The impact of this biological simplification can be far-reaching.

The Impacts of Invasive Species

Watershed Health

Invasive species can impact watershed health by reducing water quality, canopy cover, and stream bank stability. When invasive species replace a native riparian forest, the reduced canopy cover and root diversity lead to an increase in water temperatures and an increase in the rate at which rainwater enters the stream. This can make streams more prone to flooding, incision, and erosion. In turn, this can lead to increased turbidity, siltation, and the mobilization of legacy pesticides.

Biodiversity

When a few invasive species replace a broad diversity of native trees, shrubs, and herbaceous plants, the value of the habitat is severely reduced. Native plants provide shelter, food, and structure that animals depend on for survival. As floristic diversity is reduced at a site, so too is faunal diversity. Invasive species have been partially or wholly responsible for the decline of 42 percent of threatened and endangered species (Pimentel *et al*. 2005)[5].

Meadow hawkweed is an invasive species that can outcompete native plants in a meadow or pasture.

Agriculture and Forestry

Invasive plants are estimated to reduce the annual productivity of the United States agricultural sector by 12 percent (Pimentel 2009)[6]. For many farmers, controlling invasive species on their land can be one of the most time consuming and expensive aspects of crop production. The additional labor and chemical application costs associated with controlling these invasive species results in higher costs to consumers. Similarly, the cost of conducting forestry activities has greatly increased the need to control invasive species after harvesting trees. Failure to control invasive species on farms and forests can either lead to crop loss or require expensive intervention to prevent crop loss.

Soil Health

Many invasive plants are known to change soil composition, available moisture, and soil chemistry. Some invasive plants are also known to be allelopathic, altering soil chemistry by releasing chemicals through their roots or by dropping leaves onto the surrounding environment. Allelopathic chemicals can prevent seeds of desirable species from germinating or can reduce their growth and survival. For example, in areas where garlic mustard (*Alliaria petiolata*) has become heavily established, few other species are able to grow, allowing garlic mustard to spread more rapidly.

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[5] Pimentel, D, R. Zuniga, D. Morrison. 2005. Update on the environmental and economic costs associated with alien-invasive species in the United States. *Ecological Economics* **52**:273– 288.

[6] Pimentel, D. 2009. Environmental and Economic Costs of the Application of Pesticides Primarily in the United States. Integrated Pest Management: Innovation-Development Process. pp 89-111. Springer Netherlands.

Tree Cover

The native forest canopy provides the lowest cost, most sustainable form of temperature regulation, storm water interception, and wind buffering available. These ecosystem services make our communities more livable, more sustainable, and more attractive. However, throughout the Clackamas Basin, forests are being or have been replaced or compromised by invasive species such as English ivy (*Hedera helix*), old man's beard (*Clematis vitalba*), Himalayan blackberry (*Rubus armeniacus*), and knotweed species (*Fallopia japonica, F. ×bohemica,* and *F. sachalinensis*).

Economics and Society

Invasive species are calculated to cause approximately $120 billion in losses and control costs to the nation's economy each year (Pimentel 2005)[6], impacting society directly and indirectly. They increase costs and reduce productivity on both the farm and in the forest. They harm water quality, and thus increase the need for costly infrastructure to clean and manage both stormwater and drinking water. They also reduce the diversity of species in native habitats, sometimes requiring costly intervention to prevent species from becoming threatened or endangered. Invasive species can reduce the value of land and interfere with desired land uses. They also reduce the resilience of our communities, making them more susceptible to storms, power outages, flooding, heat waves, and landslides.

Invasive species are impacting the Clackamas River Basin in the same ways that they are impacting the rest of the nation. Community resilience and livability have been reduced. Habitat, water quality and biological diversity are diminished. Farming, forestry, and other economic activities are losing significant productivity due to invasive species. Despite efforts to date, the diversity and abundance of invasive species in the Clackamas Basin continue to increase. This can only result in greater costs to residents, greater losses in productivity for farms, forests, and businesses, and reduced biological diversity and habitat quality for future generations.

Management Strategies

In developing the *Clackamas River Invasive Species Management Plan,* the CRISP partners outlined a framework for managing invasive species within the basin. This framework includes four primary prescriptions that can be applied to address the threat of invasive species: prevention; survey and EDRR; control, containment, and exclusion; and restoration. Application of each prescription is based on habitat values, availability of resources, species and site prioritizations, and the quality of existing data. Ideally, at least one prescription can be applied to every area of the basin.

Boot brushes are one tool to prevent the spread of invasive species.

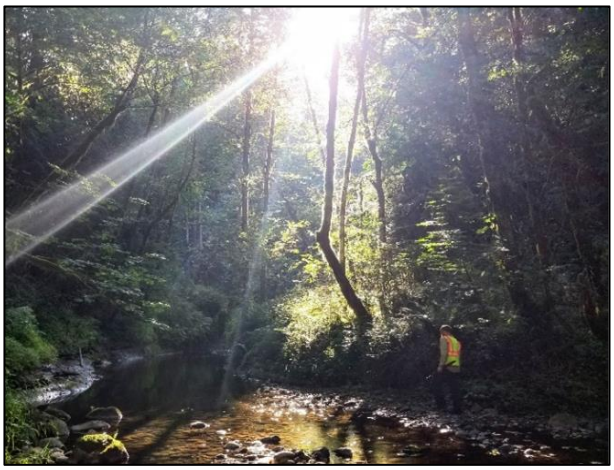
Prevention

Preventing the spread and introduction of new invasive species is the first and most important strategy in the basin. This prescription is designed to be implemented basin-wide, but with a particular emphasis on frequently visited recreation sites and areas with

significant habitat value. Actions include public education about invasive weeds, installation of boot cleaning stations and informational signage, requiring machinery to be cleaned before and after mobilization to a site, and use of weed-free straw and gravel, among other strategies.

Survey and EDRR

The second strategy against invasive species in the basin is to develop a robust, basin-wide program for surveying and mapping new and priority invasive species. The focus of this prescription will be developing a methodology for identifying priority survey areas, integrating presence and absence data for priority invasive species into a shared database, and identifying and eradicating new invasive plants before they can establish.



A contracted crew member scouts for invasive weeds. Surveys are important for early detection and control.

Control, Containment, and Exclusion

Many invasive species are already widely established in the basin; others are well established only in portions of the basin. The focus of this prescription is to develop a strategic approach that allows the partners to prioritize specific species and patches for control. Control efforts focus on identifying vector pathways for spread and preventing further expansion. Existing data about habitat quality, known weed patches, species-specific biology, and partner restoration efforts allow infestations to be prioritized to maximize the impact of existing resources within the basin.

Restoration

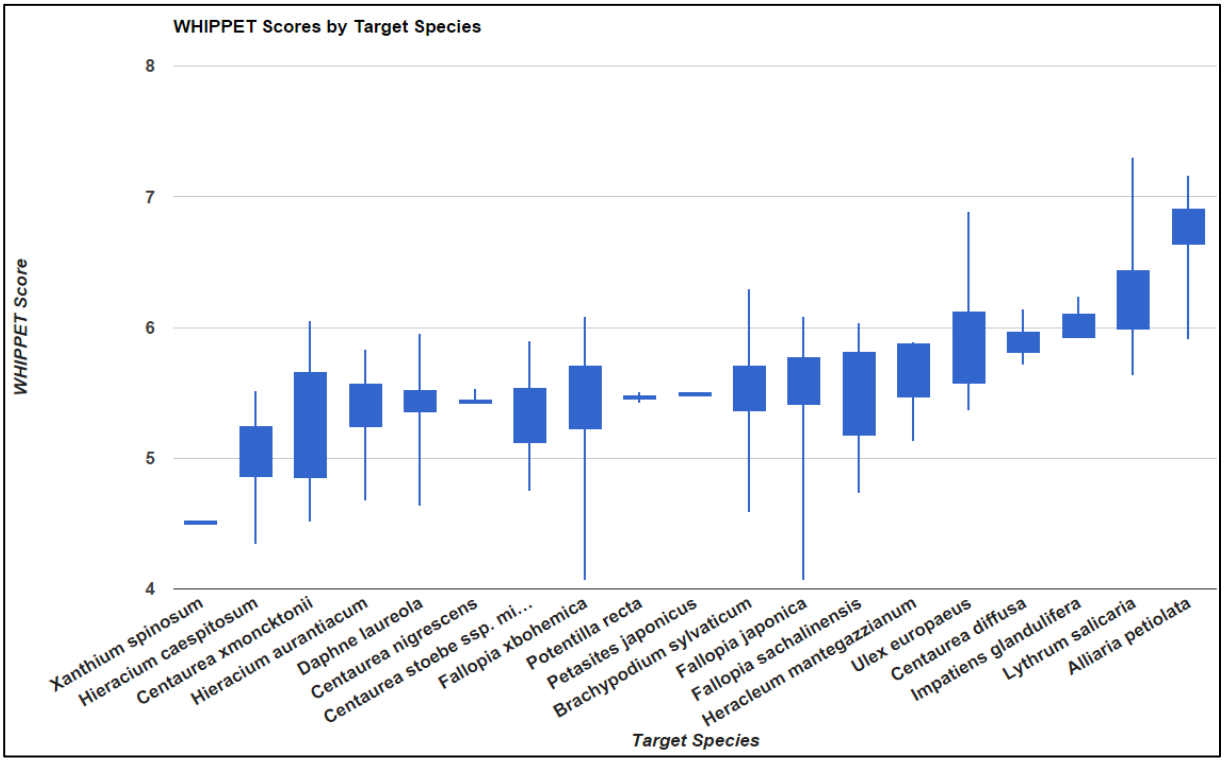
Once invasive species invade an area, their presence can dramatically alter the composition of natural systems. In heavily impacted areas, the functional diversity of a site may become so compromised that the system is unable to recover without direct intervention following invasive species removal. Restoration of native plant communities is an important tool for reducing the risk of re-colonization by invasive species and is typically necessary when a site will not naturally recover following invasive species removal. Restoration efforts are employed only when there is a reasonable degree of certainty that large-scale disturbances will not occur at the site in the near future. Also due to the relative expense of restoration efforts, the landowner or managing agency must have adequate funding to ensure successful restoration and long-term maintenance of the site following implementation.

Partnership Priorities

The *Clackamas River Invasive Species Management Plan* defines a set of priorities to maximize the impact of CRISP partner efforts. This effort consists of developing objective models to define the species and infestations to target as well as the geographical priorities for implementation by CRISP partners.

Invasive Species Prioritization

To prioritize invasive species, a prioritization model known as the *Weed Heuristics: Invasive Population Prioritization for Eradication Tool* (WHIPPET)[7], was adapted for use within the Clackamas River Basin. Using WHIPPET, CRISP partners evaluated 19 species. Species with the highest mean rankings include *Alliaria petiolata, Lythrum salicaria, Impatiens glandulifera, Centaurea diffusa, and Ulex europaeus, Heracleum mantegazzianum, and Fallopia* spp. The WHIPPET model prioritized infestations based on their relative impact, invasiveness, and feasibility of eradication. The resulting patch prioritization served as a tool to improve implementation at local and regional scales. Since the initial prioritization, CRISP members have adjusted the priority weed list to its current version, which includes 27 species.



WHIPPET model score distributions for 19 target species evaluated.

Priority Invasive Species List (as of 2020)

- *Ailianthus altissima*, tree of heaven
- *Alliaria petiolata,* garlic mustard
- *Brachypodium sylvaticum,* slender false brome
- *Carduus pycnocephalus,* Italian thistle
- *Centaurea diffusa*, diffuse knapweed
- *Centaurea solstitialis,* yellow star-thistle
- *Centaurea stoebe*, spotted knapweed
- *Centaurea xmoncktonii*, meadow knapweed
- *Daphne laureola*, spurge-laurel
- *Euphorbia oblongata*, oblong spurge
- *Fallopia japonica,* Japanese knotweed
- *Fallopia sachalinensis,* giant knotweed
- *Fallopia xbohemica,* Bohemian knotweed
- *Galega officinalis*, goatsrue
- *Heracleum mantegazzianum*, giant hogweed
- *Hieracium aurantiacum*, orange hawkweed

[7] Skurka Darin GM, Schoenig S, Barney JN, Panetta FD, DiTomaso JM (2011) WHIPPET: a novel tool for prioritizing invasive plant populations for regional eradication. Journal of Environmental Management 92(1):131-139

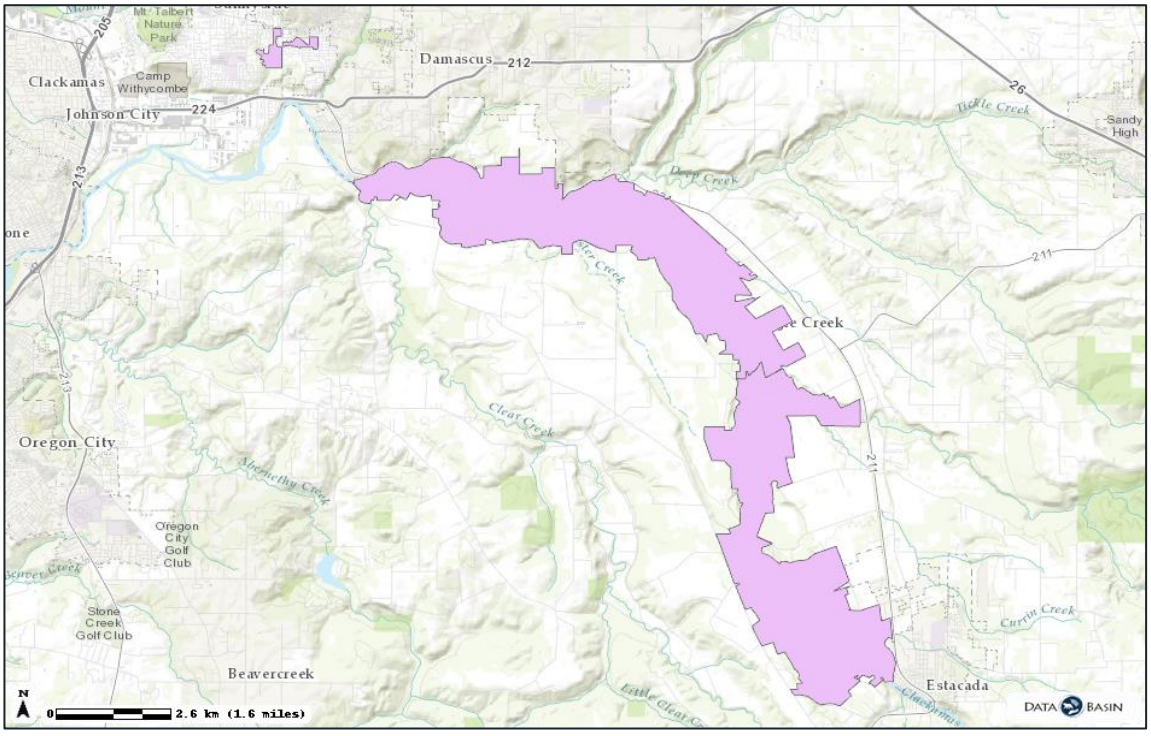
- *Hieracium caespitosum*, meadow hawkweed
- *Hieracium pilosella*, mouseear hawkweed
- *Impatiens glandulifera*, policemen's helmet
- *Ludwigia hexapetala*, water primrose
- *Ludwigia peploides*, floating primrose-willow
- *Lythrum salicaria*, purple loosestrife
- *Petasites japonicus*, Japanese butterbur
- *Potentilla recta*, sulfur cinquefoil
- *Silybum marianum*, milk thistle
- *Tribulus terrestris*, puncturevine

Geographic Prioritization

The *Clackamas River Invasive Species Management Plan* applies to the Clackamas River Basin as defined by the Clackamas Hydrologic Unit Code (17090011) in Clackamas and Marion counties of Oregon. Due to the size and complexity of the watershed, as well as resource scarcity, CRISP partners prioritized specific geographic action areas. They ranked sub-watersheds as high, medium, or low priority based on:

- data from the Intertwine Alliance's Regional Conservation Strategy (http://www.theintertwine.org/projects/regional-conservation-strategy),
- existing partner participation,
- rare, threatened, and endangered species, and
- partner investments and engagement

From this assessment four sub-basins were identified for implementation: the upper watershed, North Fork Eagle Creek, Dubois Creek/Clackamas River, and Lower Clackamas River/Rock Creek. To further focus collaborative efforts in the initial implementation phase, CRISP partners identified targeted focus areas along the Clackamas River, from the Carver Boat Ramp to Barton Park, between Barton Park and Milo McIver State Park, as well as a small urban area in Happy Valley near Sieben Creek.



This map shows the initial targeted focus areas.

Accomplishments

The many activities undertaken by the CRISP in 2020 demonstrate the partnership's growing strength. The Covid-19 pandemic and historic wildfires created some significant difficulties in 2020. These issues led to increased costs when hiring contractors; more time planning complicated logistics; budget cuts that forced partners to make difficult decisions; and lost time due to closures, stay-at-home orders, and hazardous air quality. Despite these difficulties, the CRISP continued to implement strategies identified in the *Clackamas River Invasive Species Management Plan.* Through collaboration both inside and outside of official meetings, CRISP partners discussed the difficulties surrounding these hurdles and were able to problem-solve and develop better strategies. Partners continued to improve coordination of activities and use their experience and knowledge of invasive plants to close gaps in management and enhance existing efforts.

The 2020 season was the fourth full year of implementation after securing grant funding through the PGE administered *Clackamas Mitigation Fund*. These resources, in conjunction with other CRISP partner support greatly enhanced the capacity of the CRISP to address new invasive species threats in the basin. 2020 was also the fourth full year of having a dedicated CRISP specialist, housed within the Clackamas SWCD WeedWise program, to help with coordination and implementation of CRISP-related projects.

Individual organizations within CRISP continue to accomplish an immense amount of work within the watershed. Member organizations are working steadily to combat invasive weeds and to restore degraded habitat. The increased communication and collaboration between partnering organizations resulting from the partnership has enhanced these efforts significantly over the last several years.

Meetings and Coordination

Following development of the *Clackamas River Invasive Species Management Plan*, CRISP partners established a summer and winter meeting schedule for the CRISP. Coordination has been bolstered through a shared CRISP calendar and online directory. These two resources have helped to establish a fixed schedule and consistent access to supporting documentation.

In July 2020, the CRISP partners gathered virtually to discuss CRISP partner activities. The event was attended by 10 representatives from seven participating organizations. The summer meeting included discussions and announcements of important CRISP activities including:

- Update on the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund grant* and general budget review.
- Review of the MOU and formal election of the CRISP chair and vice chair per the MOU.
- Covid-19 discussion with partners sharing updates from their organizations regarding funding, difficulties, and strategies with contractors.
- Update to partners about priority weed list changes.
- Updates from CRISP partners about spring 2019 activities and ongoing efforts.
- Discussion of two knotweed projects proposed by CRISP members for the fall.

The CRISP also held a winter meeting in December 2020, attended by 15 representatives from eight organizations. The winter meeting incorporated relevant updates and discussions on topics including:

- Update on the budget, including the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund grant,* eliminated USFS funding due to summer wildfires, the addition of funds from Clackamas County Parks, and discussion of other potential funding sources.
- Updates from CRISP partners about 2020 activities and ongoing efforts.
- Covid-19 discussion with partners sharing both difficulties and success strategies.
- Wildfire discussion about reports (BAER and ETART), partner concerns and plans, and invasive plant responses to wildfire.
- Review of 12 projects proposed for 2021 by CRISP members. Partners needed to prioritize projects due to reduced funding, and many projects were either eliminated or scaled down.

CRISP partners pose for a goofy photo at the December 2020 virtual meeting.

CRISP Partnership Projects

In 2020, CRISP partners continued to use the project proposal process, developed in 2017, to submit projects for discussion and prioritization. These projects are implemented using the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund*, as well as funds from other contributing partners. The project proposal process facilitates prioritization and discussion among CRISP partners to help ensure that the positive impact of our resources is maximized. It has also allowed the CRISP to take advantage of partner familiarity with on-the-ground needs and ensure that management gaps are filled. Using this project proposal process, the CRISP completed 10 weed control and survey projects in 2020, submitted by six different CRISP partners.

BUDGET SUMMARY

REVENUE SOURCE	2020
PGE	$258,192
Metro	$30,000
BLM	$7,500
Mt Hood NF	$53,630
CSWCD	$35,000
TOTAL REVENUE	**$384,322**

EXPENSES	2020
Contracted Services	$131,511
CRISP Sponsored Projects	$131,511
Personnel Services	$89,999
CRISP Specialist	$79,652
CRBC Services	$10,347
TOTAL EXPENSES	**$221,510**
PROJECTED BALANCE	**$245,786**

IN KIND CONTRIBUTIONS

DOCUMENTED SOURCES	2020
Contracted Services	$470,306
CSWCD Contracted Services	$3,152
Metro Contracted Services	$391,600
CRBC Contracted Services	$20,821
NRCS Contracted Services	$8,363
USFS funds to ODA and USFS staff	$46,370

Documented revenue and expenses from CRISP partners in 2020.

Grants and Funding

Despite significant impacts to local budgets due to COVID-19, the CRISP has been able to continue uninterrupted over the last year. The past year marked the last year of implementation of project work associated with the PGE-administered *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* that CRISP was awarded in 2016. Although our 2016 award ended in 2020, the ongoing efforts of the CRISP were recognized by PGE, and CRISP was awarded a second award of $258,192 to fund implementation through 2023. In conjunction with these resources, our CRISP partners dedicated an additional $665,075 in cash and in-kind contributions to support this effort. Thank you, CRISP partners!

In addition to the PGE funds, in 2020 Clackamas SWCD committed $35,000, the BLM committed $7,500, and Metro committed $30,000. Additionally, the Mt Hood National Forest also granted CRISP's request for Retained Receipts funding for $53,630, thus bringing 2020 revenue sources, outside the *Clackamas Fund,* to $126,130.

In addition to the $126,130 in cash contributions and the $131,511 spent on CRISP-sponsored projects, CRISP partners documented an additional $470,306 in contracted weed control and restoration services. Furthermore, the CRISP continues to seek additional grant funds to support the implementation of the *Clackamas River Invasive Species Management Plan*.

Partner Contracting

Clackamas SWCD, on behalf of the CRISP, invested significant resources in developing and administering contracts and agreements between funders and partners in 2020. This included administering the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* and associated agreements. On behalf of CRISP, the Clackamas SWCD also sought and received project funding for 2020 through the Mt Hood National Forest retained receipts program. To support this effort, contracting was completed in 2020.

Contractor Pool

One of the barriers to implementation identified by several CRISP partners in the *Clackamas River Invasive Species Management Plan* was inadequate access to qualified weed control and restoration contractors. To help address this issue, the Clackamas SWCD has maintained not-to-exceed contracts with professional weed control, restoration, and botanical survey contractors, known as the contractor pool. These contractors are used for all CRISP projects and help CRISP partners streamline weed control efforts across ownership boundaries and facilitate more effective and consistent weed management.

Outreach

In support of the *Clackamas River Invasive Species Management Plan,* the Clackamas SWCD and the Clackamas River Basin Council continued their outreach efforts to private riparian landowners within the targeted demonstration areas, on properties adjacent to high priority invasive weeds, and along Clackamas tributaries targeted for weed control and restoration efforts. Close to 200 letters about priority weed surveys, weed treatment, and restoration activities were sent to private landowners within the basin. Staff followed up with many contacts and provided new weed surveys, priority weed treatments, and technical advice to private landowners across the Clackamas River Basin.

Due to the Covid-19 Pandemic, many events planned by CSWCD and CRBC were cancelled in 2020. However, both organizations are planning to resume events for 2021, though they may be virtual. The CSWCD's WeedWise website contains pages about the partnership, and about ongoing CRISP projects, such as the upper watershed surveys and the goatsrue project.

Data Management

To improve data sharing and data collection, the Clackamas SWCD— in conjunction with the 4-County CWMA Mapping and Data subcommittee— developed a data collection standard for use by CRISP partners. CRISP partners are encouraged to adopt these standards to streamline future data analysis. CRISP partners have also been encouraged to submit weed observation, survey, and treatment data to Oregon iMapInvasives (http://login.imapinvasives.org/orimi/map/) to inform invasive species management at the state and regional scale.

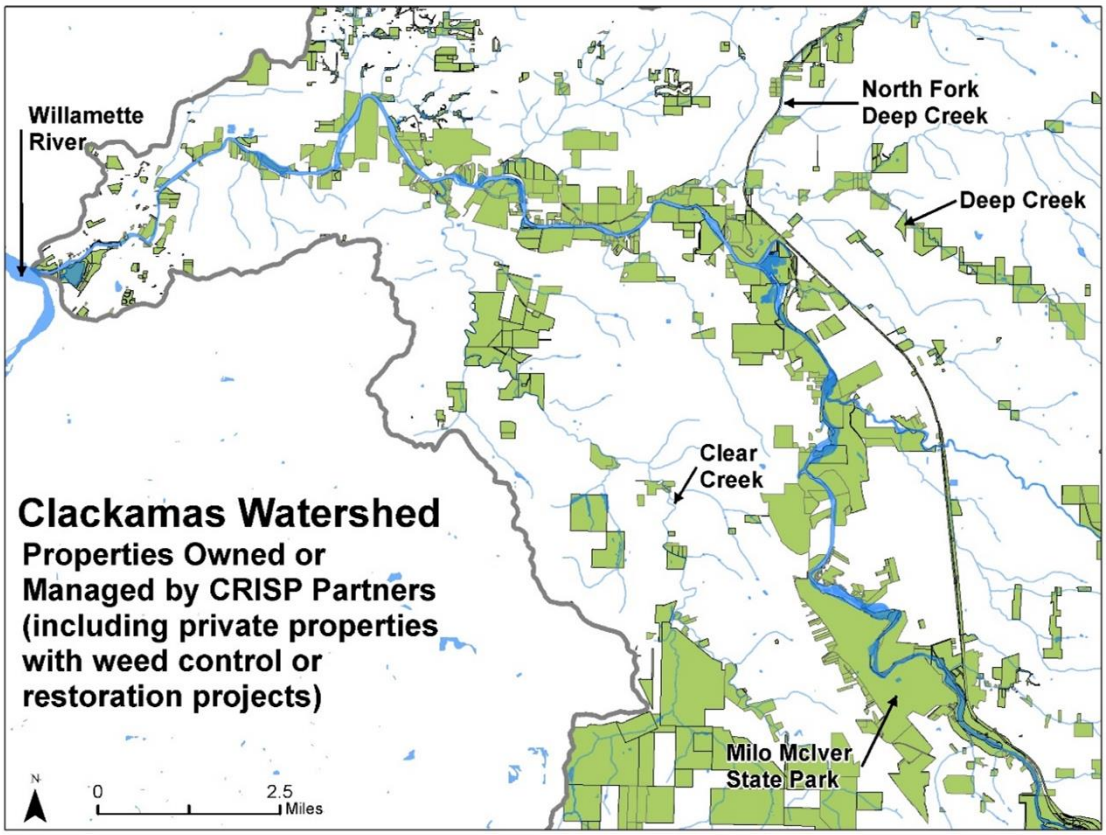
The Clackamas SWCD also provided two trainings in 2020 for the Fulcrum data collection system (http://www.fulcrumapp.com/) and priority weed identification. These trainings were focused on contractors in the CRISP contractor pool, as well as interested CRISP partners. The Fulcrum system is currently in use by Clackamas SWCD to coordinate CRISP contractors and collect data. The system has also been used in a limited capacity by CRBC, NCPRD, PGE, and OPRD.

2020 Implementation Highlights

As 2020 was the fourth full year of implementation of the CRISP Management Plan, the initial momentum has continued and there is much to celebrate. This year had many challenges due to Covid-19 and wildfires, so any work completed feels like an accomplishment!

Access to properties

Thanks to the collaborative CRISP efforts, many geographic gaps continue to be filled. Some partners access and manage their own land, while other partners conduct outreach to private landowners, while still others collaborate to make sure unmanaged public land gets treated. As a result, CRISP partners collectively have access to a lot of land!



This map shows Clackamas Basin properties collectively owned or managed by CRISP partners as of December 2020.

Garlic Mustard & Islands

According to the WHIPPET prioritization model, garlic mustard has the highest priority populations in the Basin. It spreads rapidly, crowds out native plants, and weed managers across the Portland Metro area spend a large amount of resources to control it. In 2020, CSWCD treated garlic mustard at 79 sites, with many of these sites receiving 2 or 3 treatments. This is in addition to control already happening on CRISP-owned properties (e.g., Metro treats garlic mustard on properties they own).

Garlic mustard is a high priority weed affecting many floodplain areas along the Clackamas.

Despite closures and increased costs and coordination due to Covid-19, CRISP partners carried out a third year of garlic mustard control on Clackamas islands (treatments also included knotweed

and false brome). Not only were these islands a significant management gap in need of attention, but they were also a difficult hurdle as accessing and treating islands can be complicated. The islands have been a major source of weed infestations, and these treatments mean that millions of seeds will not be carried down the river. Within the Clackamas Basin, 82% of known garlic mustard patches are within the floodplain, and as seen in the map in the "Access to Properties" section above, CRISP partners have access to much of the land near the River, meaning we are able to effectively keep this weed in check.

North Fork Deep Creek

After prioritization discussions and surveys between Metro, CRBC, and CSWCD in 2019, CRISP expanded their knotweed treatment area to include North Fork Deep Creek. After surveying 5 properties and treating 4 in 2019, CSWCD surveyed 4 more properties in 2020 and treated knotweed on 6. Contractors also found a previously unknown patch of garlic mustard. Garlic mustard was previously unknown on N Fork Deep Creek, so this early discovery will prevent it from spreading throughout the whole tributary. Furthermore, Metro manages weeds on multiple properties they own along this creek, and in 2020, they purchased a new 35-acre property near the confluence of Deep Creek and N. Fork Deep Creek.

Deep Creek Knotweed

Deep Creek is a tributary of the Clackamas River, and it has been heavily infested with knotweed. Prior to CRISP, CRBC had treated knotweed along the creek, but only in a 100-foot riparian buffer on properties that qualified for the Shade our Streams program, which left many areas untreated. As part of a CRISP project they proposed in 2017, CRBC began a multi-year focused knotweed treatment project on Deep Creek. After successful treatments since 2017 and continued outreach to many landowners, they are now reaching 15 properties, with many of them on an every-other-year treatment schedule because the densities have decreased. This important work adds to the positive impact from their work through the Shade our Streams program and has allowed them to treat a very long, almost continuous stretch of Deep Creek that had been heavily invaded with knotweed. Landowners are seeing these good results, and the news is spreading, leading to more landowners signing up.

Knotweed creates thick monocultures in riparian areas and has been a major problem along Deep Creek. CRBC has been able to treat it with the help of CRISP. Photo: Sound Native Plants

CRBC staff also located a previously unknown population of policeman's helmet during some monitoring work, and treatment plans for 2021 include treating this weed. On the lowest section of Deep Creek, below the confluence with N Fork Deep Creek and before it joins the Clackamas, CSWCD is controlling weeds on 11 properties. The work that CRBC, CSWCD, and Metro are doing on both Deep Creek and North Fork Deep Creek, is preventing a huge amount of weeds from reinfesting riparian areas of the Clackamas River.

Upper Watershed: Survey and Treatment Collaboration

Of the 92 surveys completed in 2020 by CRISP partners, 26 were in the upper watershed, allowing us to find and control new populations of false brome, knapweeds, and other weeds in areas that rarely get monitored. In 2020, CSWCD contractors surveyed much of the 58 Road system, while CSWCD staff surveyed campgrounds that were closed due to COVID-19, and USFS staff surveyed parts of the 54-road system that were being prepared for timber harvest. This data will be incredibly useful to prioritize weed control activities after the large Riverside Fire.

The increased surveys since 2017 have allowed us to find many weed patches while they are still small, making eradication more likely and saving money in the long run. The communication cultivated by the partnership allows us to act rapidly to treat weeds and prevent further spread. For example, when USFS staff found a large false brome infestation on a trail near 5420, he communicated the situation with the CRISP coordinator, who was then able to spray the trail just a few days later.

Weed treatments in 2020 continued to expand as a result of the increased coordination between the USFS, PGE, ODA, and CSWCD. ODA focused on weeds in the upper half of the National Forest, CSWCD tackled known weed patches in the lower half, PGE treated weeds on properties they manage within their Federal Energy Regulatory Commission (FERC) boundary, and USFS staff treated weeds in various locations and collaborated with and supported the other three partners.

Pale Blue-Eyed Grass in the National Forest

Pale blue-eyed grass (Sisyrinchium sarmentosum) is threatened by invasive species and encroaching trees and shrubs.

Pale blue-eyed grass, *Sisyrinchium sarmentosum,* is a rare iris with only about 24 known sites worldwide, all of which are in the PNW. Pinhead Creek, which is in the Clackamas Ranger District of the Mt. Hood National Forest, contains several subpopulations of pale blue-eyed grass, all of which are being encroached upon by weedy vegetation and shrubs. As a result of the partnership and retained receipts funding awarded to CRISP by the USFS, CSWCD was able to hire a contractor in 2019 to address the weeds and shrubs encroaching on this rare and sensitive plant. In 2020, CSWCD and USFS staff visited the site to monitor the effectiveness. Five of the subpopulations appeared to have increased density and/or area, while one of the subpopulations appeared to have been affected negatively by the treatment. It is difficult to determine the effectiveness from just one site visit a year later and monitoring in future years will help determine the best strategies. This project had been needing attention for many years, and the CRISP provided both the momentum and necessary channels for CSWCD and the USFS to work collaboratively to act.

Implementation Summary

In 2020, CRISP participating organizations carried out a significant amount of weed control and restoration work within the Clackamas River Basin. Although reported metrics differ substantially between CRISP partnering organizations, a meta-analysis of reporting organizations revealed that in 2020, CRISP partners

- Maintained a database of location information for 24,056 weed observations from 222 species
- Maintained permissions for over 700 public and private properties[8], on about 4400 parcels[9]
- Carried out surveys on 92[10] sites totaling more than 530 acres[11]
- Treated invasive weeds on over 346[12] sites totaling over 3119 gross acres[13]
- Planted over 130,275[14] shrubs, trees, and live stakes and 175 lbs. of native seed[15] at more than 39 restoration sites[16]

Although impressive, the accomplishments documented here only represent a portion of the data reported from ten of our 14 CRISP participating organizations. Therefore, these accomplishments should be considered as highly conservative estimates of activities undertaken.

Contract crews preparing for knotweed control.

[8] Reporting organizations: BLM, Clackamas County, CLT, CRBC, CSWCD, OPRD, & USFS

[9] Reporting organizations: BLM, Clackamas County, CLT, CRBC, CSWCD, Metro, NCPRD, OPRD, PGE, USFS, & WES

[10] Reporting organizations: CRBC, CSWCD, & Metro

[11] Reporting organizations: CRBC & CSWCD

[12] Reporting organizations: CRBC, CSWCD, CLT, Metro, NCPRD, NRCS, ODA, OPRD, PGE, & WES

[13] Reporting organizations: CRBC, CSWCD, CLT, Metro, NCPRD, NRCS, OPRD, PGE, USFS, & WES

[14] Reporting Organizations: CRBC & Metro

[15] Reporting Organizations: Metro & PGE

[16] Reporting Organizations: CRBC, Metro, PGE, & WES

Partner Expenditures Summary

In 2020, CRISP partners reported significant expenditures in support of weed control and restoration activities within the Clackamas Basin. Analysis of partner reported partner expenditures revealed:

- A total of 2113 staff hours[17]
- A total of $691,816 in contracted weed control and restoration services[18]
- In addition to partner expenditures, $131,512 was spent on contracted services for CRISP-sponsored projects. Ten different projects were proposed and completed by six partners: Clackamas County, CLT, CRBC, CSWCD, Metro, and OPRD.

Participating Organization Activities

CRISP partner organizations reported a significant number of activities undertaken over the last year within the Clackamas River Basin. The information provided by partnering organizations differed between organizations in terms of scope and specificity, and therefore, the items documented below may not fully reflect all activities of an organization or the entirety of work underway. Organizational activities included here were either reported through an annual summary by the partnering organization or through documentation from CRISP partner meetings.

Many of the reported activities have been undertaken independently of the CRISP planning efforts, but are provided here to illustrate the breadth and volume of work currently underway by CRISP partners within the Clackamas River Basin to control and prevent the spread of invasive weeds. In sharing these accomplishments, the partnership hopes to increase awareness and facilitate better cooperation among CRISP partners moving forward with implementation in subsequent years.

4-County CWMA

The 4-County Cooperative Weed Management Area (CWMA) focuses on support and enhancement of weed management across the Portland Metro region. Each year, Clackamas County hosts one 4-County CWMA general meeting. In 2020, Clackamas SWCD was scheduled to host the annual field day. However, due to the Covid-19 pandemic, the event was postponed to 2021.

The 2020 Pull Together was held at the Kennedy School in Portland. Here, participants learn about the knotweed biocontrol.

The 4-County CWMA also organizes and hosts the annual "Pull Together," a large event where weed managers can learn the latest news on invasive species management. Many CRISP partners and contractors were part of the 150 people in attendance, making it the highest attendance in the 11 years of the event.

[17] Reporting organizations: CLT, CSWCD, Metro, & OPRD

[18] Reporting organizations: In-Kind Services from CRBC, CSWCD, Metro, NRCS, & USFS

The 4-County CWMA Mapping and Data sub-committee provides support to CRISP partners through the development and maintenance of data collection standards. These standards provide guidance to organizations collecting weed observations and treatment data. The standards are integrated with Oregon iMapInvasives to support data sharing throughout the state and region.

In cooperation with the Columbia Gorge CWMA, the 4- County CWMA has continued to develop a series of Best Management Practices guides. These guides outline control methods for 22 invasive weeds and have been made available to CWMA partners for use within their own organizations.

Bureau of Land Management- Northwest Oregon District (BLM)

The Bureau of Land Management- Northwest Oregon District reported active management efforts in the Clackamas River Basin in cooperation with the Clackamas SWCD. In 2019, two BLM properties just upstream from Barton Park were targeted for control and/or survey, and three BLM parcels in the upper watershed were treated for roadside weeds. The lower watershed properties are near several other CRISP partner activities. The upper watershed sites are a high priority because of their location; treatments of these small roadside weed patches will help to prevent more pristine forested areas from being impacted.

False brome is a significant invader being managed by BLM throughout its management areas.

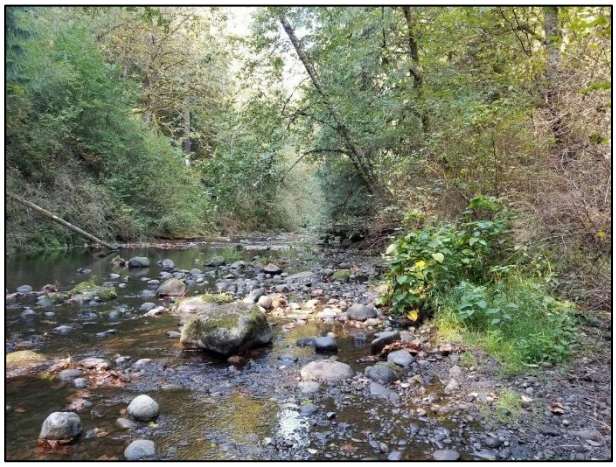
In 2019, after many years of work, the BLM was able to finalize an Environmental Assessment that will allow the BLM to both treat invasive weeds that do not currently have a state-listed noxious weed designation. Escaped plants such as periwinkle (*Vinca minor*) are currently impacting several properties within the Clackamas River targeted sub-basins but could be treated under current rules. Many of these invasive weeds are of particular concern, especially in high-quality natural areas in the Eagle Creek sub-basin. The EA will also allow the BLM and its partners to expand their options for herbicide control, allowing land managers to choose more effective herbicides.

In addition to active weed management efforts, the BLM also provided funding to support the CRISP dedicated WeedWise Specialist for coordination and implementation of the *CRISP Management Plan.*

Clackamas County - Parks

Clackamas County Parks routinely manages weeds as part of their standard park maintenance activities. In managing established parks, Clackamas County Parks serves at the interface between the public and natural areas, providing opportunities to promote outreach and education efforts to the general public. Due to the heavy use of these areas by the public, they are also threatened by the introduction of invasive species through human-mediated dispersal. Clackamas County Parks also works with the County Dumpstoppers program to address illegal garbage dumping on public lands. These dump sites have been identified as likely introduction points for new invasive weeds into the watershed.

In 2020, priority weed control efforts on County properties were carried out in cooperation with CRBC and CSWCD. At Barton Park, Metro did restoration work and weed treatments from 2014 to mid-2018, in conjunction with their work at River Island Natural Area. However, their funding for Barton Park ended in 2018. As a result of the CRISP collaboration, partnership, and funding, CSWCD was able to continue these weed treatments in 2019 and 2020 to protect the years of work done by Metro.



Clear Creek runs through Metzler Park, where there has been just a few small patches of knotweed. Our work has prevented knotweed from spreading and protects this habitat for salmon and other aquatic life.

At Fisherman's Bend, CRBC treated weeds in the 100-foot riparian buffer through their "Shade our Streams" program, which helps protect their prior restoration planting. They also treated knotweed, garlic mustard, and other weeds across other parts of the site. At Billy Goat Island, a caretaker has been working to clear invasive weeds and revegetate the site, and CSWCD has been contributing to this work through the CRISP, treating both garlic mustard and knotweed. At Metzler Park, where just a few stems of knotweed grew along the stream, CSWCD treated them, preventing larger infestations downstream.

At Madrone Wall, where rocky bluffs are home to nesting peregrine falcons. The site also contains old growth Douglas fir trees, many species of native plants, and a noteworthy population of Madrone trees. CSWCD worked with a contractor to control small patches of sulfur cinquefoil and false brome.

Clackamas River Basin Council (CRBC)

The Clackamas River Basin Council is proud to be a part of the CRISP collaborative process. Their work has included detailed management, planning, and coordination with ongoing CRBC projects such as the Shade Our Streams program, as well as with CRISP-specific weed projects with high priority weeds along Deep Creek and other key locations. Not only does their work in the CRISP program target and restore riparian areas not already being managed by their other programs, but it also helps to protect the important investment of both Shade Our Streams and other restored properties by reducing future invasive species and EDRR weed threats in the lower basin.

CRBC has worked with a major cash match from PGE in their Shade Our Streams program to help remove invasive weeds and install streamside forests in the Clackamas River Basin. Each of their restoration sites is accessed with an eye towards EDRR weeds and potential participation in the CRISP program. The funding for this program ended at the conclusion of 2020 with the completion of their obligation to complete 30 miles of stream restoration in the lower Clackamas.

On Deep Creek, CRBC has been treating knotweed with the support of CRISP since 2017. Five of their knotweed treatment sites on Deep Creek were in their fourth year of treatments and showed, on

With the support of the CRISP, CRBC has been treating knotweed on Deep Creek since 2017, and their work is making a big impact. This photo is from a site that has been treated 3 years in a row.

average, a 95% rate of control. Their ten third year knotweed treatment sites on Deep Creek showed 75% control on average. They also had two properties that were controlled for the first time in 2020. All knotweed treatment properties on Deep Creek are privately owned and landowners have been happy with the results and are sharing their successes with neighbors who might not have originally signed up with the program. One new landowner at the uppermost extent of the knotweed infestation signed up and received treatments on their dense 3-acre patch in 2020.

Other Notable activities accomplished by the CRBC in 2020 include:

- Surveyed 345 acres. This includes 2.1 miles of streamside properties on Deep Creek, a 2-acre upland knotweed infestation in Sandy, 20 acres of historical Shade our Stream sites on the Clackamas, their final 5 Shade Our Streams sites, one project in the North Fork Reservoir on BLM land, and four OWEB Focused Investment Partnership (FIP) sites in two Clackamas River side channels as well as at the confluences of Sieben Creek and Eagle Creek at Bonnie Lure State Park.

A contracted crew treats a thick knotweed patch at a first year Deep Creek site.

- Treated CRISP priority weeds at 26 sites along Deep Creek and the Clackamas, totaling 45 acres. Weeds treated were knotweed, meadow knapweed, false brome, and garlic mustard.
- Treated weeds on 61 acres and 4.69 stream miles through the Shade our Streams program.
- Worked on various phases of 31 different restoration projects. This includes planting over 90,000 native trees and shrubs on the Clackamas mainstem, in side channels, and on tributaries.
- Sent 20 pieces of outreach information to potential partnering landowners. Personalized letters were sent to non-respondents. General invasive weed information, knotweed information, and CRBC's "Parting with Pesticides" program information were all shared with each landowner.
- Participants were invited to a series of landowner educational workshops hosted by CRBC including What's in My Stream, Living with Wildlife, Naturescaping at Home and Healthy Streams and Forests. However, due to Covid-19, these classes did not take place in 2020.

Clackamas Soil and Water Conservation District (CSWCD)

The Clackamas SWCD operates an active weed control program in the Clackamas River Basin and throughout Clackamas County. This work is spearheaded through both their conservation planning efforts and the WeedWise program. The WeedWise program focuses on landscape scale management of invasive weeds. In particular, the focus of this program is the management of priority invasive weeds that may have limited abundance and distribution within Clackamas County. Current efforts by the WeedWise program include offering free control of priority invasive weeds to private property owners across the county. This service is voluntary and provided as a service to county residents. The WeedWise program also maintains a county priority weed list for use by regional land managers, based on statewide risk assessments and the abundance of weeds within Clackamas County. This weed list can be found on the WeedWise website (https://weedwise.conservationdistrict.org/weeds).

Mouseear hawkweed is an ODA class A noxious weed. As a result of CRISP surveys, a previously unknown patch, only the 2nd in Clackamas County, was found and treated.

In 2020, the CSWCD WeedWise program continued to serve as administrators for the CRISP. A primary focus of the WeedWise program in this effort has been to build capacity and infrastructure to support CRISP-related activities. In this capacity, the WeedWise program has also served as a hub for CRISP-related information pertaining to the mapping of weed observations, site surveys, treatments, project sites, and priority weed information associated with the *Clackamas River Invasive Species Management Plan*.

In 2020, the CSWCD continued its focus on education and outreach to support the CRISP, though activities

were reduced due to Covid-19. The WeedWise program hosted their annual contractor and partner training, focusing on invasive weed identification and data collection. In addition to website posts about CRISP weed control projects and the upper watershed surveys, the WeedWise program also featured updates of CRISP-related activities on social media. These updates are intended to inform the public and help to raise awareness about current CRISP efforts.

The WeedWise program also initiated two landowner mailings, sending 169 letters to private landowners along the Clackamas River and its tributaries. These letters resulted in 17 new landowner permissions, which allowed the CSWCD to find new weed observations and begin weed treatments.

Notable activities in 2020 undertaken by the WeedWise program within the Clackamas Basin include:

- Surveyed 25 locations in the upper watershed with a focus on closed campgrounds (due to Covid-19) and the 58-road system. These surveys identified new observations of false brome, meadow knapweed, sulfur cinquefoil, shiny and Robert's geranium, English ivy, greater periwinkle, invasive blackberries, lesser celandine, and creeping wild rye
- Surveyed 19 sites in the lower watershed for a total of 185 surveyed acres across the entire basin
- Carried out 411 invasive weed control treatments at 214 different sites, with total gross size of 681 treated acres
- Treated knotweed at 64 sites on the Clackamas River upstream from Richardson Creek, in the Eagle Creek Basin, lower Deep Creek, North Fork Deep Creek and middle/upper Clear Creek (monitored an additional 6 sites with no knotweed found)
- Treated garlic mustard on 74 sites (monitored an additional 3 sites with no garlic mustard found).
- Other weed treatments in the lower watershed: false brome (40 sites), purple loosestrife (11 sites), spurge laurel (8 sites), sulfur cinquefoil (9 sites), policeman's helmet (4 sites), oblong spurge (6 sites), orange hawkweed (7 sites), meadow hawkweed (5 sites), mouseear hawkweed (1 site), giant hogweed (1 site), goatsrue (2 sites), and milk thistle (1 site)
- In the upper watershed, CSWCD treated false brome (7 sites), spotted/diffuse knapweed (6 sites), meadow knapweed (1 site), shiny/Robert's geranium (4 sites), rush skeleton weed (1 site), goutweed (1 site), holly (1 site), knotweed (1 site), bird's foot trefoil (1 site), Himalayan blackberry (1 site), creeping wild rye (1 site), English ivy (1 site), sulfur cinquefoil (1 site)
- Maintained a total of 24,056 weed observations within the basin for 222 invasive weed species, adding 470 new observations in 2020

CSWCD treated invasive weeds on 12 Clackamas River Islands in 2020. These treatments help prevent the spread of weeds in riparian and floodplain areas. Photo: Mosaic

- Maintained 685 active permissions with private landowners
- Invested 1295 hours of total staff time on CRISP-related activities
- Spent a total of $134,663 on contracted services inside the Clackamas Basin

Clackamas Water Environment Services (WES)

Clackamas Water Environment Services (WES) supports weed control efforts in the lower portions of the Clackamas River Basin on the natural areas they own, and on site-specific restoration projects in conjunction with their RiverHealth Stewardship Grant Program. The grants vary from year to year, but frequently involve invasive weed control activities. For example, in the 2020-21 fiscal year, the RiverHealth Stewardship Program is funding 3 groups that are conducting river restoration, erosion control projects, and outreach, which includes treating weeds or outreach to landowners for future riparian work within the Clackamas Basin.

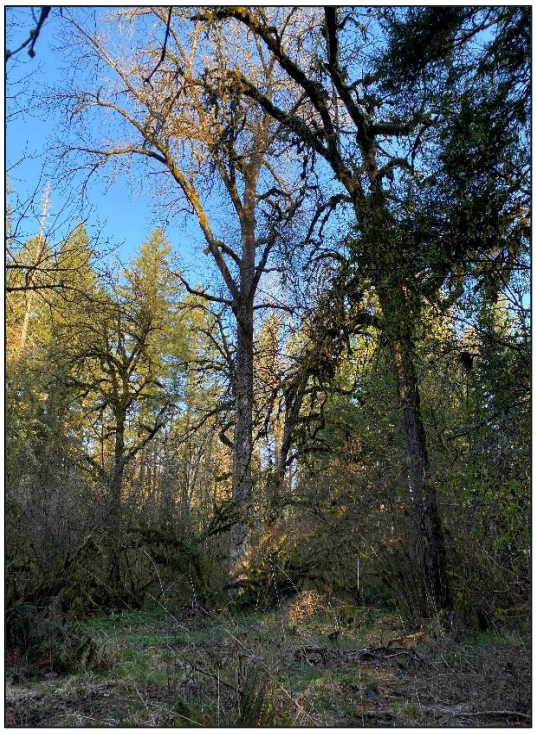
The Carli Creek site, located on the lower portions of the Clackamas River, is a constructed wetland for storm water treatment. WES has been treating weeds here after completing the planting in 2019.

In 2020, WES continued to maintain Carli Creek, a 15-acre constructed wetland completed in 2019 for storm water treatment. Invasive weed treatments are ongoing and will continue over the coming years to maintain the project after implementation.

With the help of NCPRD, WES also continued ongoing invasive species control on its other natural areas in the Clackamas basin, including the Rock Creek Confluence site (approximately 12 acres), and the Rose Creek Natural Area (approximately 5.6 ac).

Columbia Land Trust

Columbia Land Trust is a private, non-profit organization that owns and manages land as habitat for fish and wildlife in the lower Columbia River region of Oregon and Washington. The Land Trust also holds conservation easements on private lands and provides technical support to landowners. In the Clackamas River watershed, the Land Trust owns a 23-acre riparian and upland forest called the McGahan Natural Area, located across the river from Milo McIver State Park. The Land Trust also holds a conservation easement on a 32-acre site near Madrone Wall Park. The Clackamas SWCD has partnered with the Land Trust to control weeds on the McGahan site since at least 2012. Columbia Land Trust joined CRISP in late 2017.



CLT has done a lot of restoration and weed control work at the McGahan Natural Area.

In 2020, CRISP funded one fall herbicide treatment at the 23-acre McGahan site. Target species included false brome (*Alliaria petiolata*), ivy (*Hedera hibernica*; *H. helix*), yellow archangel (*Lamiastrum galeobdolon*), English holly (*Ilex*

aquifolium), Himalayan blackberry (*Rubus armeniacus*), tansy ragwort (*Jacobaea vulgaris*), thistle (*Cirsium* spp.), and empress tree (*Paulownia tomentosa*).

Prior to the fall treatment, Land Trust staff implemented manual control of false brome, thistle, and tansy ragwort during three site visits in the spring and summer. Columbia Land Trust staff also continued to restore habitat by maintaining native vegetation in small areas along the property boundaries where neighbors' yards and structures have encroached on the natural area in the past. Columbia Land Trust staff dedicated 18 hours to on-site CRISP-related activities at the McGahan Natural Area (contractor coordination and weed control).

Metro

With the help of staff, partners, and contractors, Covid-19 safety protocols were implemented to keep critical work moving through 2020. Building on the accomplishments of previous years, Metro controlled a variety of invasive weeds across its properties. In the Clackamas Basin, many sites were the focus of extensive weed management work, including Bakers Ferry, Barton Natural Area, Cazadero, Cazadero North, Clackamas Bluffs, Clear Creek Canyon, Clear Creek North, Jonsson Center, North Fork Deep Creek, North Fork Deep Creek North, North Fork Deep Creek South, North Logan, Richardson Creek, River Island, and Upper Abernethy Natural Areas. Early detection and rapid response (EDRR) treatments were completed by staff or contractors depending on timing, extent, and funding availability, while site-wide treatments were typically completed by contractors.

In 2020, Metro initiated the following activities:

- 15 sites surveyed and treated
- 1890 total site acres under management
- Over 32 species managed including: Italian arum (*Arum italicum*), blackberry (*Rubus bifrons*), black locust (*Robinia pseudoacacia*), butterfly bush (*Buddleja davidii*), old man's beard (*Clematis vitalba*), creeping bellflower (*Campanula rapunculoides*) false brome (*Brachypodium sylvaticum*), garlic mustard (*Alliaria petiolata*), goutweed (*Aegopodium podagraria),* Ivy (*Hedera hibernica & H. helix*), knotweed (*Fallopia japonica, F. sachalinensis, and F. × bohemica*), lesser celandine (*Ranunculus ficaria),* meadow knapweed (*Centaurea × moncktonii*), milk thistle *(Silybum marianum),* policeman's helmet (*Impatiens glandulifera*), American pokeweed (*Phytolacca americana*), purple loosestrife (*Lythrum salicaria*), reed canary grass (*Phalaris arundinacea*), Scotch broom (*Cytisus scoparius*), spurge laurel (*Daphne laureola*), thistles (*Cirsium* sp.), tutsan (*Hypericum androsaemum*), velvet leaf (*Abutilon theophrasti*), yellow arch angel (*Lamiastrum galeobdolon*), yellow flag iris (*Iris pseudacorus*), periwinkle (*Vinca* sp.), poison hemlock (*Conium maculatum*), English holly (*Ilex aquifolium*), teasel (*Dipsacus fullonum*), and other grasses, broadleaf weeds, and weedy trees
- Over 800 staff hours invested
- Invasive control utilizing 8 contract firms, with receipts totaling $140,000
- Native plantings and plant maintenance utilizing 8 contract firms, with receipts totaling over $251,600

- $30,000 in Metro CRISP cash match annually

Additional notes of interest:

- Metro planted 35,275 native trees and shrubs, 5000 native live stakes, and 125 pounds of native seed throughout 6 of the 15 Clackamas River sites in 2020.
- Two new EDRR weeds were detected in 2020 and treated on Metro sites; velvet leaf (*Abutilon theophrasti*) at Richardson Creek, tutsan (*Hypericum androsaemum*) at 3 Clear Creek sites.

Hypericum androsaemum, aka Tutsan, is moving through riparian areas along 3 Clear Creek Metro sites, certainly one to keep an eye on.

Site-specific activities by location include:

Bakers Ferry

- EDRR: garlic mustard (*Alliaria petiolata*), false brome (*Brachypodium sylvaticum*), Italian arum (*Arum italicum*), yellow flag iris (*Iris pseudacorus*), purple loosestrife (*Lythrum salicaria*), policeman's helmet (*Impatiens glandulifera*), lesser celandine (*Ranunculus ficaria)*
- Site wide: knotweed (*Fallopia japonica, F. sachalinensis, F. ×bohemica*), butterfly bush (*Buddleja davidii*), knapweed (*Centaurea* sp.), ivy (*Hedera hibernica & H. helix*)

Barton Natural Area

- EDRR: knotweed (*Fallopia japonica, F. sachalinensis, F. × bohemica*), purple loosestrife (*Lythrum salicaria*), garlic mustard (*Alliaria petiolata*), meadow knapweed (*Centaurea × moncktonii*), Italian arum (*Arum italicum*). Monitoring for sulfur cinquefoil (*Potentilla recta*) as populations were found in close proximity by CSWCD
- Site wide: false brome (*Brachypodium sylvaticum*), butterfly bush (*Buddleja davidii*), spurge laurel (*Daphne laureola*), old man's beard (*Clematis vitalba*), *H. helix* Ivy (*Hedera hibernica & H. helix*), Scotch broom (*Cytisus scoparius*)

Clear Creek Canyon

- EDRR: knotweed (*Fallopia japonica, F. sachalinensis, F. ×bohemica*), Yellow arch angel (*Lamiastrum galeobdolon*), purple loosestrife (*Lythrum salicaria*), tutsan (*Hypericum androsaemum*)
- Site wide: false brome (*Brachypodium sylvaticum*), meadow knapweed (*Centaurea × moncktonii*), ivy (*Hedera hibernica & H. helix*), and periwinkle (*Vinca* sp.)

Clear Creek North

- EDRR: knotweed (*Fallopia japonica, F. sachalinensis, F. × bohemica*), Italian arum (*Arum italicum*), butterfly bush (*Buddleja davidii*), Yellow arch angel (*Lamiastrum galeobdolon*), tutsan (*Hypericum adrosaemum*)
- Site wide: false brome (*Brachypodium sylvaticum*), ivy (*Hedera hibernica & H. helix*)

Cazadero Natural Area

- EDRR: meadow knapweed (*Centaurea × moncktonii*), false brome (*Brachypodium sylvaticum*)
- Site Wide: Scotch broom (*Cytisus scoparius*), spurge laurel (*Daphne laureola*), and tansy ragwort (*Jacobaea vulgaris*)

Clackamas Bluffs

- EDRR: false brome (*Brachypodium sylvaticum*)
- Site Wide: old man's beard (*Clematis vitalba*), periwinkle (*Vinca* sp.), ivy (*Hedera hibernica & H. helix*), sweet cherry (*Prunus avium*), holly (*Ilex aquifolium*),
- A new parcel was purchased in 2018 adding 100 acres to this site

Cazadero North

- EDRR: yellow flag iris (*Iris pseudacorus*), American pokeweed (*Phytolacca americana*)
- Site Wide: ivy (*Hedera hibernica & H. helix*), teasel (*Dipsacus fullonum*)

Jonsson Center

- EDRR: creeping bellflower (*Campanula rapunculoides*), yellow archangel (*Lamiastrum galeobdolon*), knotweed (*Fallopia japonica, F. sachalinensis, F. × bohemica*), purple loosestrife (*Lythrum salicaria*), tutsan (*Hypericum adrosaemum*)
- Site Wide: false brome (*Brachypodium sylvaticum*), ivy (*Hedera hibernica & H. helix*), periwinkle (*Vinca* sp.), and Scotch broom (*Cytisus scoparius*)

North Fork Deep Creek North

- EDRR: knotweed (*Fallopia japonica, F. sachalinensis, F. × bohemica*), Italian arum (*Arum italicum*), American pokeweed (*Phytolacca americana*)
- Site Wide: ivy (*Hedera hibernica & H. helix*), periwinkle (*Vinca* sp.)

North Fork Deep Creek

- EDRR: knotweed *(Fallopia japonica, F. sachalinensis, F. × bohemica)*
- Site Wide: sweet cherry *(Prunus avium),* holly *(Ilex aquifolium),* lemon balm *(Melissa officinalis),* vinca *(Vinca spp.),* ivy *(Hedera hibernica & H. helix)*

North Fork Deep Creek South

- EDRR: policeman's helmet *(Impatiens glandulifera),* American pokeweed *(Phytolacca americana* knotweed *(Fallopia japonica, F. sachalinensis, F. × bohemica),* yellow arch angel (*Lamiastrum galeobdolon*), yellow flag iris (*Iris pseudacorus*)
- Site Wide: butterfly bush (*Buddleja davidii*), Scotch broom (*Cytisus scoparius*), spurge laurel (*Daphne laureola*), and tansy ragwort (*Jacobaea vulgaris*), holly (*Ilex aquifolium*), sweet cherry (*Prunus avium*), vinca *(Vinca spp.*), ivy (*Hedera hibernica & H. helix*)

North Logan

- EDRR: knotweed (*Fallopia japonica, F. sachalinensis, F. × bohemica*), lesser celandine (*Ranunculus ficaria,* close to eradication), butterfly bush (*Buddleja davidii*), meadow knapweed (*Centaurea ×moncktonii*), garlic mustard (*Alliaria petiolata*), gout weed (*Aegopodium podagraria),* purple loosestrife (*Lythrum salicaria*)

- Site wide: false brome (*Brachypodium sylvaticum*), scotch broom (*Cytisus scoparius*), ivy (*Hedera hibernica & H. helix*), periwinkle (*Vinca* sp.), old man's beard (*Clematis vitalba*)

Richardson Creek

- EDRR: garlic mustard (*Alliaria petiolata*), Italian arum (*Arum italicum*), yellow flag iris (*Iris pseudacorus*) knotweed (*Fallopia japonica, F. sachalinensis, F. × bohemica*), false brome (*Brachypodium sylvaticum*), milk thistle *(Silybum marianum)*, velvet leaf (*Abutilon theophrasti*), purple loosestrife (*Lythrum salicaria*)
- Site wide: old man's beard (*Clematis vitalba*), periwinkle (*Vinca* sp.), ivy (*Hedera hibernica & H. helix*), blackberry (*Rubus bifrons*), reed canary grass (*Phalaris arundinacea*)

Purple loosestrife (Lythrum salicaria) hiding amongst natives along the river's edge. Four additional populations of purple loosestrife were found across 4 Metro sites in the Clackamas Basin. 2020 proved to be a good growing year for both invasive species and native plants.

River Island

- EDRR: knotweed *(Fallopia japonica, F. sachalinensis, F. × bohemica),* garlic mustard *(Alliaria petiolata),* Italian arum *(Arum italicum),* meadow knapweed *(Centaurea ×moncktonii),* purple loosestrife *(Lythrum salicaria),* lesser celandine (*Ranunculus ficaria,* close to eradication), poison hemlock (*Conium maculatum*)
- Site wide: false brome (*Brachypodium sylvaticum*), butterfly bush (*Buddleja davidii*), Scotch broom (*Cytisus scoparius*)

Upper Abernethy

- EDRR: false brome (*Brachypodium sylvaticum*), Italian arum (*Arum italicum*)
- Site wide: English holly (*Ilex aquifolium*), English hawthorn (*Crataegus monogyna*), periwinkle (*Vinca* sp.), ivy (*Hedera hibernica & H. helix*), blackberry (*Rubus bifrons*), reed canary grass (*Phalaris arundinacea*)

Natural Resources Conservation Service- Clackamas (NRCS)

NRCS provides technical and financial assistance to local landowners through their farm bill funded programs. Within the Clackamas River Basin, weed control efforts are typically undertaken in conjunction with other conservation practices on private lands.

Current technical and financial assistance has focused predominantly on the management of common invasive weeds. The NRCS works very closely with the Clackamas SWCD and typically refers landowners to the SWCD for weed control programs. These resources are available on an ongoing basis and, where appropriate, should be considered for CRISP-related implementation.

A Clackamas oak savanna restoration project with a crew working to control herbaceous weeds after planting.

In 2020, NRCS spent $16,725.83 in cost-share funds to treat 32.4 acres with the conservation practices of herbaceous weed control and brush management. This included forested and crop lands in both Clackamas and Multnomah Counties. The primary targets for these treatments are non-native blackberries, Scotch broom, knotweed, non-native hawthorn, and holly. These practices took place across 4 different contracts with private landowners.

NRCS is developing a Soil Health in Pasture Livestock System Conservation Implementation Strategy (CIS) so they can target grazing and pasture lands. This would help them target livestock-related resource concerns and water quality, which often include an invasive weed control component.

North Clackamas Parks and Recreation District (NCPRD)

North Clackamas Parks and Recreation (NCPRD) owns and manages four natural areas in the Clackamas watershed totaling approximately 19.6 acres. This is down from 39 acres after the City of Happy Valley took over ownership of the Hidden Falls property. Additionally, NCPRD assists Water Environment Services (WES) in the maintenance of approximately 18 acres on WES-owned property.

NCPRD received a USFS grant award for restoration work within the Rock and Sieben Creek watersheds in the 2020-2022 biennium. Funds are supporting weed control and establishment of native plant communities at the sites under NCPRD management in the Clackamas watershed. Work started in the fall of 2020 and includes the control of non-native invasive plants including Himalayan blackberry, false brome, English holly, English ivy, and English hawthorn on approximately 25 acres. The next steps include planting 6,000 to 10,000 native plants in the winter of 2021 and follow up weed treatments in the spring of 2021.

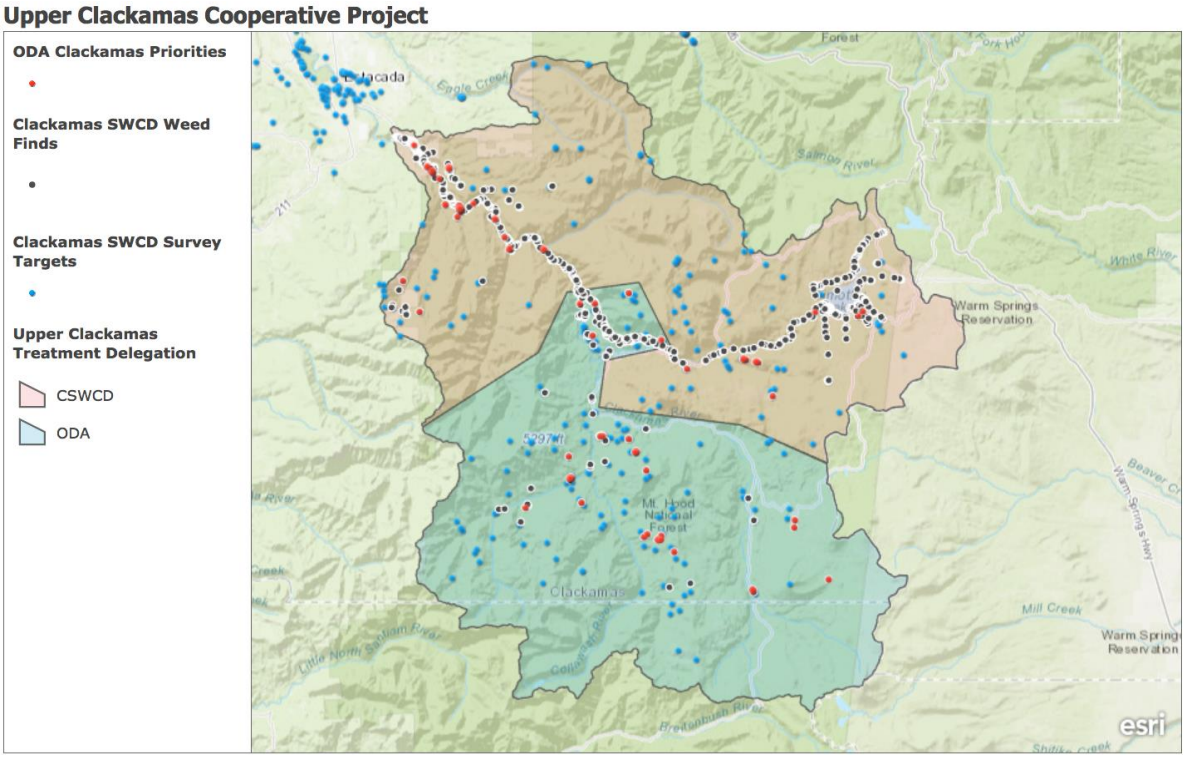
A contracted crew treats holly and ivy along Rock Creek. The work is managed by NCPRD through a USFS grant.

NCPRD serves at the interface between the public and natural areas within urban portions of the Clackamas River Basin. Their properties provide a unique opportunity to promote outreach and education efforts to the public, but are also under the greatest threat from the introduction of invasive species through human-induced movement.

Oregon Department of Agriculture (ODA) - Noxious Weed Control Program

The ODA Noxious Weed Control Program serves a leadership role in managing invasive species at the state level, providing regular guidance related to risk assessment and noxious weed listings to help protect the state from new invasive weeds. In this capacity, they also support an early detection and rapid response effort to contain, control, and eradicate high priority Class A noxious weeds, which can include enforcement of noxious weed laws when applicable. ODA also supports education and outreach efforts associated with noxious weed control through the development of noxious weed brochures, their website, and associated materials.

In addition to their state-level responsibilities, ODA implements weed control within the Clackamas River Basin on behalf of the Mt Hood National Forest. Since 2018, ODA's main focus in the Clackamas Ranger District has been addressing priority weed finds resulting from the intensive survey commissioned by Clackamas SWCD in 2017.



Map showing noxious weed survey locations and results from the Clackamas SWCD 2017 surveys, and the designated priorities for the Oregon Department of Agriculture.

The upper watershed was divided into two sections with ODA staff mainly treating sites in the uppermost section and Clackamas SWCD staff treating slightly lower elevation areas. ODA also monitored and treated previously known sites in the Ranger District as needed, and nearly all these areas were showing excellent control or were absent of plants. Overall, ODA treated weeds at about 60 locations in 2020, including Highway 224/Road 46, Timberlake Job Corps campus, Ripplebrook Rd. 4631 & 4635, Bagby Hot Springs Rd. 70 area, Collawash Rd 63 area, Rd 42, and Rd 57 area.

Clackamas Ranger Districts Weed Targets:

- Diffuse Knapweed (*Centaurea diffusa*): B-rated
- False Brome (*Brachypodium sylvaticum*): B-rated
- Japanese Knotweed (*Fallopia japonica*): B-rated
- Spotted Knapweed (*Centaurea stoebe*): B(T)-rated
- Sulfur Cinquefoil (*Potentilla recta*): B-rated

Oregon Parks and Recreation Department (OPRD)

Within the Clackamas River Basin, OPRD has a major focus on the management of invasive weeds at Milo McIver State Park. OPRD has been working for the last several years to map and treat infestations

of priority noxious weeds throughout the park system and has developed a management strategy for controlling these invasive weeds.

Weeds of greatest focus within the park are garlic mustard (*Alliaria petiolata*), false brome (*Brachypodium sylvaticum*), meadow hawkweed (*Hieracium caespitosum*), and mouseear hawkweed (*Hieracium pilosella*). Milo McIver State Park has been identified as the upstream-most infestation of both garlic mustard and false brome in the Clackamas River Basin, and therefore, control and management of these weeds are of particular importance. The park is also only one of five known locations of meadow hawkweed in the Clackamas Basin and its containment remains a very high priority. Other target invasive plants are yellow archangel, English ivy, and old man's beard.

OPRD continues to work with Clackamas SWCD, CRBC, and Integrated Resource Management to manage weeds in addition to weed work that is done by in-house staff. OPRD obtained CRISP funding to support this work, complementing the OPRD funding and staff time dedicated to weed management. OPRD continued efforts in-house and with partners in 2020 to target false brome and garlic mustard within the park, working the outlying patches, trailheads, trails, riparian floodplain, and other vector areas. OPRD staff dedicated approximately 80-120 person-hours to treatment of priority species across the park in 2020, and Integrated Resource Management treated approximately 20 additional acres for priority species later in the season.

Garlic mustard lines this trail at Milo McIver. Trails are a high priority for weed treatments due to their potential for spread. Photo: IRM

Unfortunately, 2020 was not as productive as previous years for weed management due to the COVID-19 pandemic. The park was closed for an extended period, and resources and staffing were drastically reduced as a result of the agency's extreme shutdown-related budget impacts. Park closure included access by contractors and partners for much of the spring, and effectiveness and available time to complete effective treatments suffered. In addition, new ground disturbance from construction of a pipeline feeding the fish hatchery in 2019 and early 2020 has resulted in a boom in garlic mustard abundance that will be a priority in 2021.

OPRD serves at the interface between the public and natural areas within the Clackamas River Basin. They have a genuine opportunity to promote outreach and education efforts to the public. OPRD staff also keep a lookout for CRISP priority weed species in its Clackamas basin properties.

Portland General Electric (PGE)

In 2020, Portland General Electric was active in the Clackamas River Basin implementing their Vegetation Management Plan (VMP), in accordance with Federal Energy Regulatory Commission license requirements for the Clackamas Hydro Project. Implementation of the VMP includes three interrelated programs: Vegetation Maintenance Program, Invasive Non-native Plant Species Prevention and Control Program, and Revegetation Program.

Non-Native Invasive Plant Prevention and Control

False brome patch discovered in May 2020 along PGE access road.

PGE staff conducted manual control of small invasive non-native plant infestations and employed a licensed contractor to conduct herbicide treatments of larger infestations at multiple locations in portions of the Clackamas Hydro Project license boundary within the Mt. Hood National Forest (MHNF). Approximately 16 net acres were treated on the MHNF during 2020. PGE also conducted routine invasive non-native control work at PGE facilities near Estacada, at PGE's River Mill gravel pit, at Estacada Rock Products (both are sources of rock for PGE gravel augmentation projects in the Clackamas Basin), and at restoration sites. Priority species included herb Robert, shiny geranium, false brome, knapweeds, purple loosestrife, and knotweed. More common invasive non-native species, including Scotch broom, English ivy, tansy ragwort, Canada and bull thistle, and Himalayan blackberry, were also treated.

An invasive non-native plant inventory is required every three years under VMP. Terrestrial surveys of all high-probability areas within the Project boundary were completed in 2020 by PGE biologists, and PSU Center for Lakes and Reservoirs completed aquatic plant surveys in Project reservoirs (Timothy, Harriet, North Fork, and Estacada). New populations of sulfur cinquefoil, false brome, meadow knapweed, and herb Robert were found on MHNF and PGE owned lands. These surveys will guide treatments in the coming years. No invasive non-native aquatic plants were identified in Estacada Lake, Faraday Lake, North Fork Reservoir, Lake Harriet, or Timothy Lake during 2020 surveys. The next surveys will be conducted in 2023.

PGE Revegetation and monitoring

PGE applied over 50 lbs. of native seed on disturbed sites located on the MHNF in 2020. These sites included construction and recreation sites. Due to wildfires, revegetation efforts at multiple sites were postponed until 2021.

United States Forest Service- Mt Hood National Forest

The US Forest Service works in cooperation with over 10 partners to carry out a variety of invasive weed management activities on the Mt Hood National Forest (MHNF). Invasive plant management is a high priority for the MHNF. In 2020, the MHNF spent an estimated $400,000 on invasive plant management program, and about $100,000 of that was spent inside the Clackamas Basin. These funds were mostly generated from timber sale receipts, with the rest coming from appropriated sources.

Mt Hood from the 58-road system. Photo: Green Banks.

Priority weed control activities on the National Forest are carried out in cooperation with the Oregon Department of Agriculture - Noxious Weed Control Program, Portland Water Bureau, Portland General Electric, Clackamas County, CRISP, Wasco County, Hood River County, Walama Restoration, Oregon Department of Transportation, Sandy Basin Watershed Council, and Bonneville Power Administration. In 2020, these treatments equated to over 2,000 gross acres of noxious weed control forest wide, 1,000 of which were in the Clackamas River Basin. These acres were treated by CRISP partners (CSWCD, ODA, and PGE) through agreements and retained receipts.

The MHNF is also committed to preventing the introduction of invasive weeds on the national forest. They require certified weed free forage for all livestock on the MHNF. They also require the use of certified weed-free straw, and inspections of sourced rock and gravel quarries, as well as equipment decontamination before initiating ground disturbing activities on the national forest. To support these efforts, they have also been working with partners from ODA to certify local sources of gravel and rock for use on the MHNF.

The MHNF is also committed to increasing awareness of invasive species and promoting early detection and rapid response of new invasive weeds. The Forest Service continues to partner with Play, Clean, Go, Wild Spotter, and EDDMaps West. 2020 did offer some unique challenges including wildfires which burned a large swathe of the Clackamas River basin, and the COVID-19 pandemic. These challenges were met with strong partnerships in place and work planned to continue into the future.

Thank You

Reflecting on the many accomplishments of the Clackamas River Invasive Species Partnership, it is clear there has been an immense amount of support to help stop the spread of invasive species within the Clackamas River Basin.

We would like to thank all of our participating organizations for their many contributions in 2019. The success of the CRISP reflects the commitment of these participating organizations to the long-term health of the Clackamas River Basin.

We would especially like to thank the representatives and staff of our participating organizations who have contributed their passion, expertise, and dedication to this partnership. We would also like to thank our many funders for ensuring the viability of the CRISP and for investing in the future of the Clackamas River Basin. Thank you!