

2018

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.



Clackamas River Invasive Species Partnership



Acknowledgements

This annual report has been developed on behalf of the *Clackamas River Invasive Species Partnership* (CRISP). In 2018, 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*. 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*

Contributors

Authors

Lindsey Karr, Clackamas Soil and Water Conservation District (CSWCD)

Samuel Leininger, Clackamas Soil and Water Conservation District (CSWCD)

Data Contributors and Editors

Chad Atwood, Mt Hood National Forest (MHNF)

Andrea Berkley, Oregon Parks and Recreation Department (OPRD)

Cory Quesada, Portland General Electric (PGE)

Suzi Cloutier, Clackamas River Basin Council (CRBC)

Kim Galland, Natural Resource Conservation Service (NRCS)

Lindsey Karr, Clackamas Soil and Water Conservation District (CSWCD)

Samuel Leininger, Clackamas Soil and Water Conservation District (CSWCD)

Jeffrey Lesh, Clackamas Soil and Water Conservation District (CSWCD)

Matt Mellenthin, Integrated Resource Management (IRM, writing for OPRD)

Beth Myers-Shenai, Oregon Department of Agriculture, Noxious Weed Control Program (ODA)

Kristina Prosser, Metro

Gail Shaloum, Clackamas County Water Environment Services (WES)

Mark Shaw, Oregon Parks and Recreation Department (OPRD)

Partner Representatives

Chad Atwood, Mt Hood National Forest (MHNF)

Zachary Bergen, Clackamas River Basin Council (CRBC)

Andrea Berkley, Oregon Parks and Recreation Department (OPRD)

Cory Quesada, Portland General Electric (PGE)

Suzi Cloutier, Clackamas River Basin Council (CRBC)

Terry Fennell, Bureau of Land Management, Northwest Oregon District (BLM)

Courtney Gattuso, 4-County Cooperative Weed Management Area (CWMA)

Kim Galland, Natural Resource Conservation Service (NRCS)

Thomas Gray, Clackamas County Parks

Rick Gruen, Clackamas County Parks

Peter Guillozet, Metro

Chris Hagel, Metro

James Hughes, Bureau of Land Management (BLM)

Matt Jordan, North Clackamas Parks and Recreation District (NCPRD)

Lindsey Karr, Clackamas Soil and Water Conservation District (CSWCD)

David Lebo, Mt Hood National Forest (MHNF)

Samuel Leininger, Clackamas Soil and Water Conservation District (CSWCD)

Jeffrey Lesh, Clackamas Soil and Water Conservation District (CSWCD)

Emily Matson, Columbia Land Trust (CLT)

Cheryl McGinnis, Clackamas River Basin Council (CRBC)

Jeff Merrill, Metro

Glenn Miller, Oregon Department of Agriculture, Noxious Weed Control Program (ODA)

Beth Myers-Shenai, Oregon Department of Agriculture, Noxious Weed Control Program (ODA)

Kristina Prosser, Metro

Gail Shaloum, Clackamas County Water Environment Services (WES)

Mark Shaw, Oregon Parks and Recreation Department (OPRD)

Jonathan Soll, Metro

Brian Vaughn, Metro

Tonia Williamson, North Clackamas Parks and Recreation District (NCPRD)

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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 2018, 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 invasives, resulting in the detection of several new high-priority weed infestations.

Along the lower portions of the mainstem Clackamas River, CRISP partners have increased coordination and are managing weeds from Milo McIver State Park to the confluence with the Willamette. In particular, CRISP partners have worked to coordinate work 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 \$428,085¹ in contracted weed control and restoration services in 2018. The total estimated CRISP-related personnel services reported by partners in 2018 totaled 2342.75² hours. This work supported weed surveys and treatments on over 5695 acres of public and private land³.

With many of the gaps in management occurring on private lands, the CRISP partners continued outreach efforts to private landowners to increase management of priority weeds. In 2018, CRISP partners sent 784 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. The CRISP specialist position is housed within the Clackamas SWCD's WeedWise program and has assisted with implementation of CRISP-related activities. The CRISP specialist supports activities between partners and is spearheading implementation of weed control projects throughout the watershed. This coordinated implementation has continued to enhance the work of the CRISP in 2018.

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

¹ This number accounts for resources reported by BLM, CRBC, CSWCD, PGE, and Metro

² This number only accounts for hours reported by CSWCD, CLT, and Metro

³ This number accounts for surveys and weed treatments reported by the following partners: CRBC, CSWCD, CLT, Metro, NRCS, ODA, OPRD, PGE, USFS, and WES.

⁴ These numbers only account for letters sent by Clackamas River Basin Council and Clackamas SWCD.

commitment of dedicated staff and contractors will allow CRISP to continue to address existing resource limitations and management gaps. In 2019, we look forward to continuing to build upon our accomplishments in supporting a healthier Clackamas River Basin.

Background

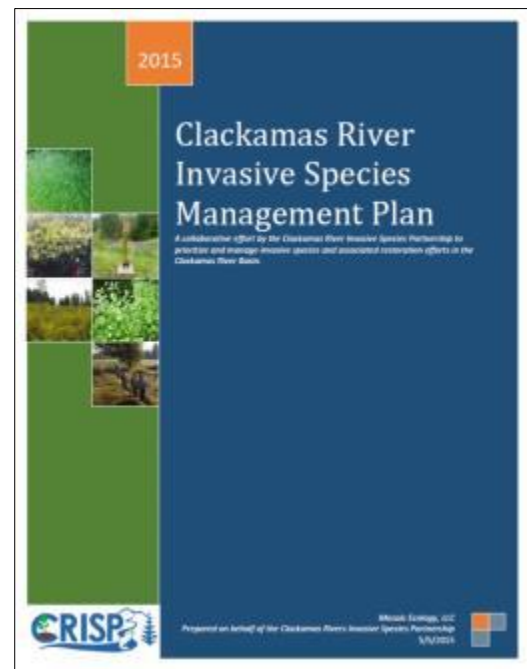
The Clackamas River Invasive Species Partnership (CRISP) was formed in 2014 through a collaborative effort by the Clackamas River Basin Council, the Clackamas Soil and Water Conservation District, and Metro to develop the *Clackamas River Invasive Species Management Plan* to prioritize and improve the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

In 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:

- 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 land owners 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; and



The Clackamas River Invasive Species Management Plan was completed in 2015

- 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.



Rare species like mountain pale blue-eyed grass (*Sisyrinchium sarmentosum*) are under continued threat from invasive species.

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.

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.

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*, *Fallopia xbohemica*, and *Fallopia sachalinensis*).

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.

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 until a new stand can be established. Failure to control invasive species on farms and forests can either lead to crop loss or require expensive intervention to prevent crop loss.

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.



*Invasive weeds like policeman's helmet (*Impatiens glandulifera*) threaten the natural regeneration of riparian forests and cause erosion problems*

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.

They also reduce the diversity of species in native habitats, sometimes requiring costly intervention in order 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 and aggressive new invaders are being found each year. This increase 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.



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

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 across the basin to address the threat of invasive species: prevention; survey and EDRR; control, containment and exclusion; and restoration. Application of each specific prescription is based on habitat values, availability of resources, species and site prioritizations, and the quality of existing data. Ideally, at least one of the four prescriptions can be applied to every area of the basin allowing for the plan to be implemented basin-wide.

Prevention

Preventing the spread and introduction of new invasive species is the first and most important line of defense 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. Prevention 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, use of weed-free straw and gravel, among other strategies.

Survey and EDRR

The second line of defense 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 to develop 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 invaders before they become established.

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 invasive species patches, species-specific biology, and partner restoration efforts allow infestations to be prioritized to maximize the impact of existing resources within the basin.



The control of invasive species uses a variety of control practices based on the ecology of the target pest and site specific conditions. Photo Credit: Sound Native Plants.

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.

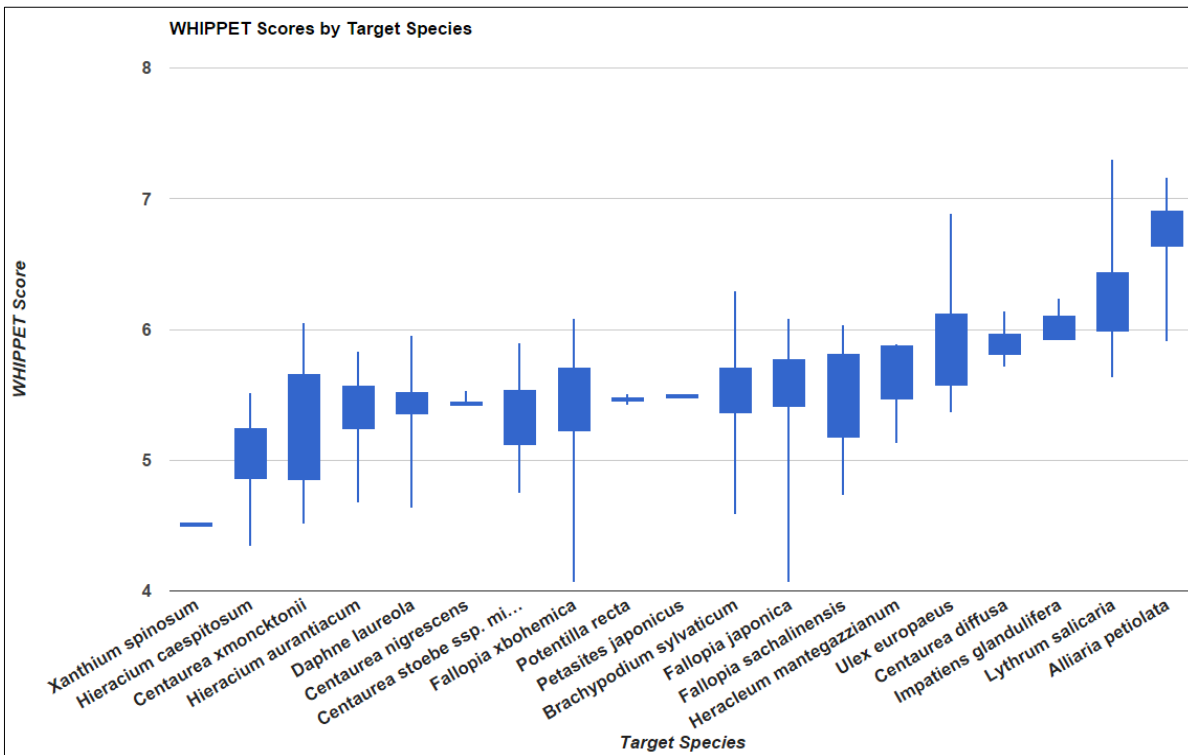
Restoration of native plant communities is an important tool for reducing the risk of re-colonization by invasive species and is typically necessary when a site will not naturally recover following invasive species removal. Restoration efforts are employed only when there is a reasonable degree of certainty 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) developed in California, was adapted for use within the Clackamas River Basin. Using WHIPPET, CRISP partners evaluated 19 species. Some of the species with the highest mean rankings include *Alliaria petiolata*, *Lythrum salicaria*, *Impatiens glandulifera*, *Centaurea diffusa*, *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.



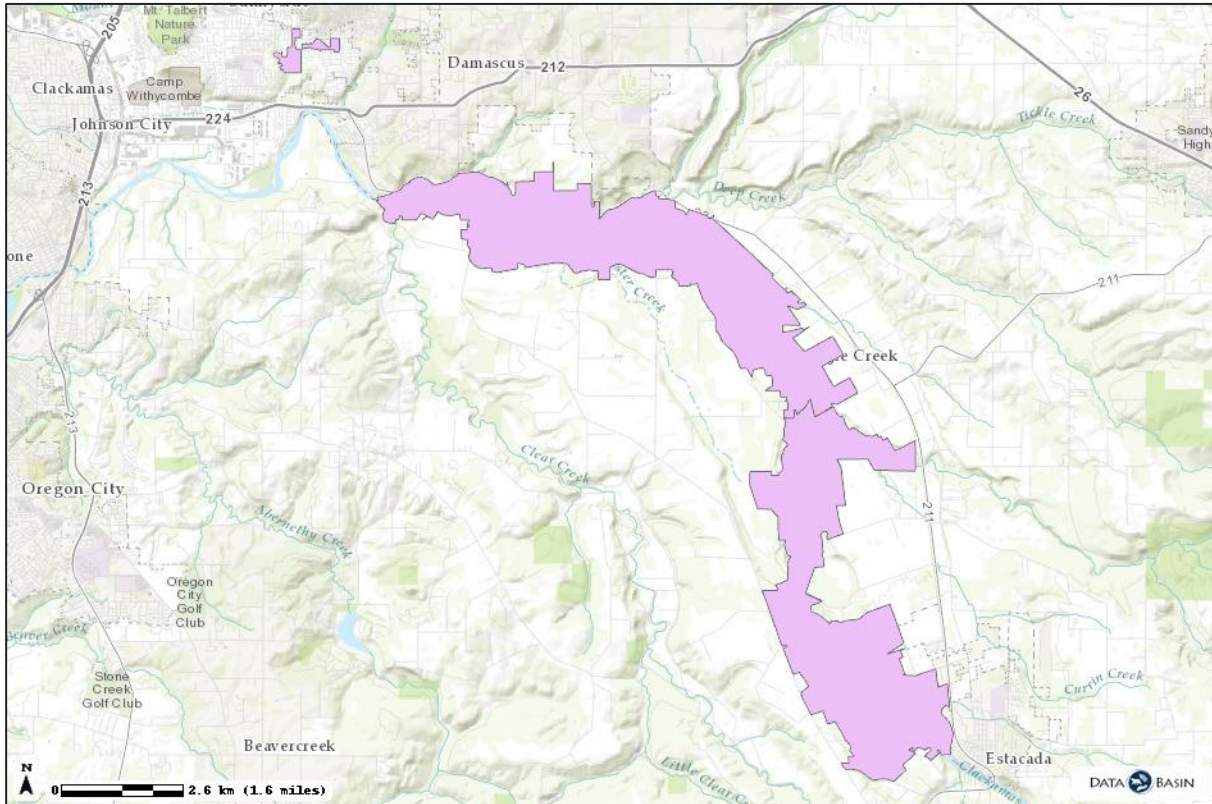
WHIPPET model score distributions for 19 target species evaluated.

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. These included 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.



The CRISP targeted demonstration areas in the Clackamas River Basin.

Accomplishments

The many activities undertaken by CRISP in 2018 demonstrate the growing strength of the partnership. The 2018 season was the second 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 CRISP to address new invasive species threats in the basin. 2018 was also the second 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.

In the 2018 field season, CRISP continued to implement strategies identified in the *Clackamas River Invasive Species Management Plan*. In particular, improved coordination of activities within the targeted demonstration areas has allowed CRISP to close gaps in management and enhance existing efforts. Development of the partnership steadily continues. CRISP has focused on building capacity and

infrastructure to solidify the partnership and secure resources to continue implementation of the management plan.

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 several years.

CRISP Partnership Projects

In 2018, 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 has provided a feedback loop 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.

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.

In July 2018, the Clackamas SWCD hosted the summer CRISP meeting to discuss CRISP partner activities. The event was attended by 12 representatives from eight participating organizations. The summer meeting unveiled a suite of new developments including:

- Update on the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund grant*;
- Announcement of Retained Receipts funding from the Mt. Hood National Forest for 2019;
- Formal election of the CRISP Co-Chairs per the MOU;
- Prevention Discussion including boot brushes, weed-free gravel certification, boot cleaning reminder stickers, and Play Clean Go resources ;
- Updates from CRISP partners about spring 2018 activities and ongoing efforts;
- Review and prioritization of projects proposed by CRISP members

The CRISP also held a winter meeting in December 2018 at the Clackamas SWCD office. This meeting was attended by 21 representatives from eleven organizations. The winter meeting updated partners on a number of CRISP-related developments including:

- Update on the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund grant*;
- Priority weed discussion including identification practice and discussion of the current weed list;
- Sharing of CRISP success stories (see following section);
- Knotweed control strategy discussion about which locations and tributaries to target;
- Updates from CRISP partners about 2018 activities and ongoing efforts;
- Review and prioritization of projects proposed for 2019 by CRISP members.

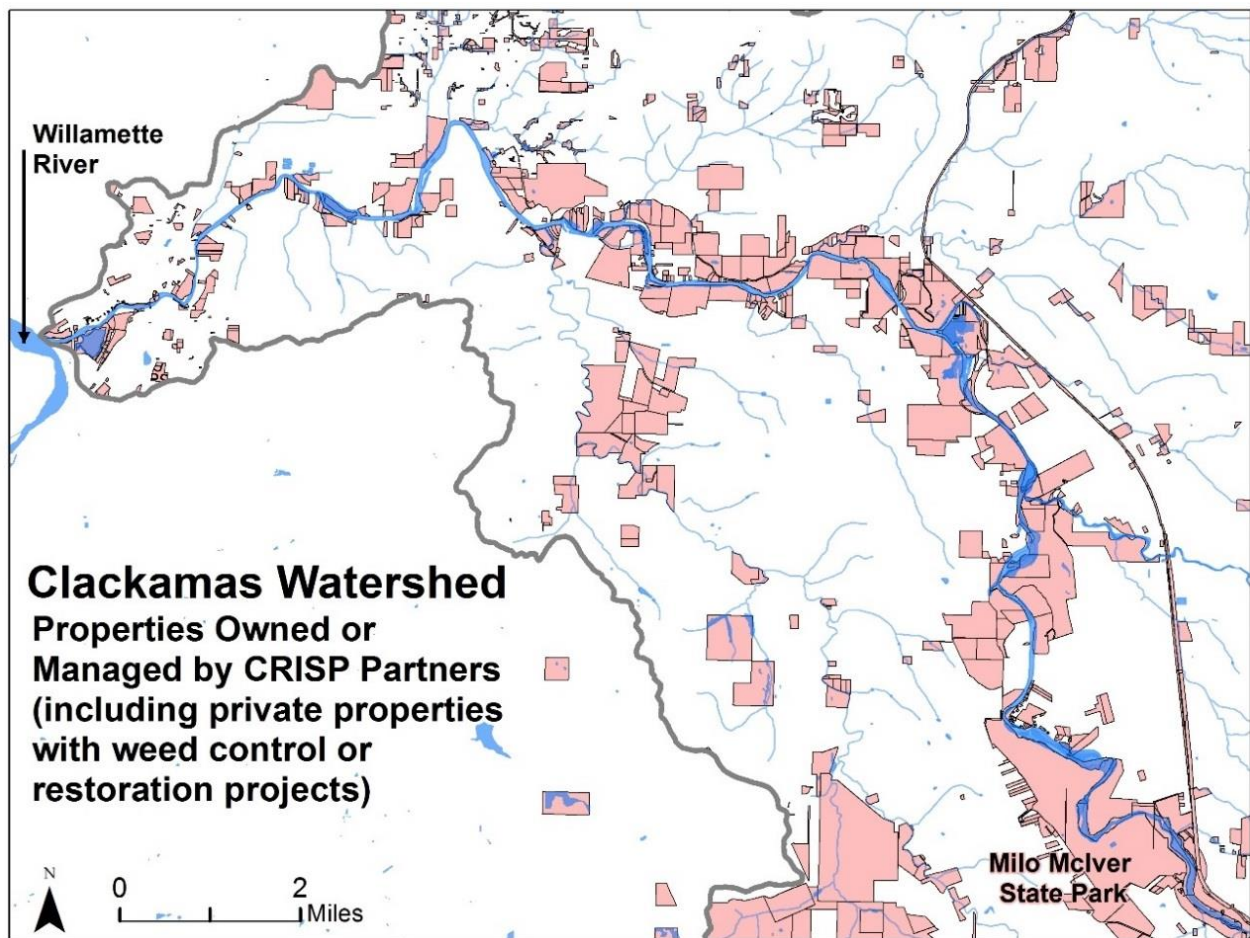
CRISP coordination has been bolstered through the use of a shared CRISP calendar and online directory. These two resources have helped to establish a fixed schedule and consistent access to supporting documentation. The online directory also allows for collaborative development of resources.

CRISP Success Stories

To celebrate a productive year, CRISP partners shared success stories at the December, 2018 meeting. As 2018 was the second year of full implementation of the CRISP Management Plan, the initial momentum has continued and there was much to celebrate.

Access to properties

Thanks to the collaborative CRISP efforts, many geographic gaps have been 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 properties owned or managed by CRISP partners in the Clackamas Basin.

Surveys

As a result of CRISP funding, collaboration, and outreach, partners were able to survey 165 new locations throughout the watershed in 2018. These surveys are critical in the effort to find new weed populations, as well as to define the edges of existing populations. These surveys also help to inform decisions about the prioritization of weed control.

Garlic Mustard

According to the WHIPPET prioritization model, garlic mustard is the highest priority CRISP weed. It spreads rapidly, crowds out native plants, and weed managers across the Portland Metro area spend a great amount of resources to control it. In 2018, CSWCD treated 76 sites, with many of these sites receiving 2 or 3 treatments, and this is in addition to CRISP-owned properties (e.g. Metro treated garlic mustard on properties they own). 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, CRISP partners have access to much of land near the River, meaning we are able to effectively tackle this highly invasive weed.



The uppermost island, near Milo McIver Park had a dense carpet of garlic mustard when CRISP partners discovered it in spring of 2018.

Clackamas Islands

One management gap in the Clackamas watershed has been the islands in the Clackamas River below the River Mill Dam. Addressing these islands was a significant hurdle as they are difficult to access and the ownership was complicated. In 2018, five different CRISP partners collaborated to make sure all but one island was treated for priority weeds (the missing island was due to private ownership). Most notably, CRISP partners discovered the uppermost island was infested with vast amounts of garlic mustard, with millions of seeds spreading downstream during high water events. This island, along with the others, is now under active

management, thus reducing the potential for spread along the river. These islands have been a major source of weed infestations, but also have great potential for high quality habitat.

Barton Park

Barton Park is a highly popular destination for camping, fishing, boating, and other forms of recreation. As a result, it also has a high potential to be a source of weed propagules that can spread to other areas. Metro began work at Barton in 2014, in conjunction with their work at the adjacent River Island property, and with some assistance from CRBC. In the spring of 2018, after spending over \$70,000 at Barton to control weeds and install plants, Metro was no longer able to fund the maintenance. Metro proposed the management of Barton Park as a CRISP project, and the project was transferred to CSWCD

without any gaps in treatments. This is an excellent example of how the partnership facilitates collaboration in order to protect the habitat restoration work and investments of different partners.

Upper Watershed

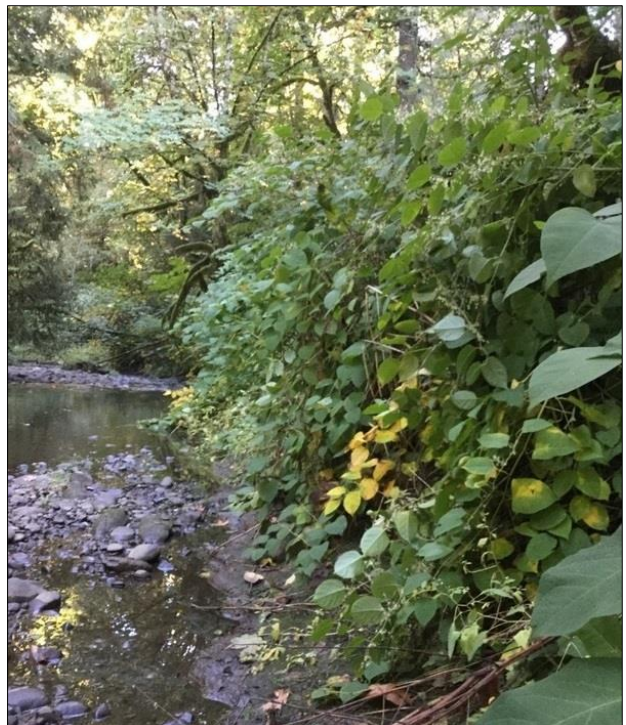
In the upper watershed, the CRISP implemented a second year of focused surveys. Similar to 2017, these surveys focused on areas with ground disturbance or an otherwise increased potential for spreading weeds. In 2018, the surveys included areas with recent road work or flooding, decommissioned roads, and dumping sites, and they yielded new discoveries of priority weeds, including knapweed species (*Centaurea diffusa*, *Centaurea stoebe*, *Centaurea xmoncktonii*), European hawkweed (*Hieracium sabaudum*), and false brome (*Brachypodium sylvaticum*). These new observations inform our weed treatments, which help protect high quality areas that are sensitive to invasion.

Goatsrue

In 2015, the largest patch of goatsrue in Oregon was found at a site in Carver, along the Clackamas River. Goatsrue is an A-ranked species in Oregon, and is thus a very high priority. CSWCD has successfully been treating this site through the CRISP since 2016, and no new patches have been found.

Deep Creek Knotweed

Deep Creek is a tributary of the Clackamas River, and the Clackamas River Basin Council began controlling knotweed along this tributary in 2017, as part of a CRISP project they proposed. After a successful treatment in 2017 and continued outreach to many landowners, CRBC was able to more than double the Deep Creek properties they were able to treat in 2018. After their first year of treatment, they noticed an 85 – 98% reduction in knotweed patches. Landowners are seeing these good results, and the news is spreading, leading to more landowners signing up. This has allowed CRBC to treat knotweed on large stretches of Deep Creek.



Knotweed has been a major problem along Deep Creek, and CRBC has been able to treat it with the help of CRISP

Grants and Funding

2018 was the second full year of the implementation of resources allocated from the PGE administered *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund*. In conjunction with this resource, CRISP partners have dedicated an additional \$72,500 in cash contributions in 2018 to support project implementation and the coordination of CRISP-related activities. Clackamas SWCD committed \$35,000, Metro committed \$30,000, and BLM committed an additional \$7,500.

CRISP BUDGET SUMMARY	
REVENUE SOURCE	
<i>PGE</i>	\$339,026
<i>Metro</i>	\$30,000
<i>BLM</i>	\$7,500
<i>Mt Hood NF</i>	\$0
<i>CSWCD</i>	\$35,000
TOTAL REVENUE	\$411,526
EXPENSES	
<i>Contracted Services</i>	\$124,785
<i>CRISP Sponsored Projects</i>	\$124,785
<i>Personnel Services</i>	\$80,843
<i>CRISP Specialist</i>	\$70,761
<i>CRBC Services</i>	\$10,082
TOTAL EXPENSES	\$205,628
BALANCE	\$205,889
IN KIND CONTRIBUTIONS	
DOCUMENTED SOURCES	
<i>Contracted Services</i>	\$244,308
<i>CSWCD Contracted Services</i>	\$36,705
<i>Metro Contracted Services</i>	\$103,886
<i>CRBC Contracted Services</i>	\$103,716
<i>Personnel Services (hrs)</i>	319
<i>CSWCD Personnel (hrs)</i>	181
<i>CRISP Partners (hrs)</i>	138

Documented revenue and expenses from CRISP partners in 2018.

In addition to these cash contributions, CRISP partners documented an additional \$244,308 in contracted weed control and restoration services, and documented 319 hours of staff time invested in CRISP-related activities.

In addition to these existing resources, the CRISP has also continued to seek additional grant funds to support the implementation of the *Clackamas River Invasive Species Management Plan*. The CRISP decided to submit a funding request for Retained Receipts funding from the Mt Hood National Forest. These resources would be used to offset contractor costs primarily in the upper portions of the Clackamas River Basin. This request was submitted in the spring 2018, and was granted for 2019 implementation.

Partner Contracting

Clackamas SWCD, on behalf of the CRISP, invested significant resources in developing and administering contracts and agreements between funders and partners in 2018. This included administering the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* and associated agreements with Metro, PGE, CRBC, and BLM.

On behalf of CRISP, the Clackamas SWCD also sought project funding through Mt Hood National Forest retained receipts program. This effort resulted in funds being awarded for implementation in 2019. To support this effort, contracting was initiated in late 2018 and will be completed in 2019.

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.

In 2018, the Clackamas SWCD maintained not-to-exceed contracts with nine professional weed control, restoration, and botanical survey contractors. The contract prices were secured competitively through a Clackamas SWCD request for proposal. These contracts have helped to ensure that implementation costs are controlled at a low rate. Known as the Contractor Pool, these contractors help CRISP partners streamline weed control efforts across ownership boundaries and facilitate more effective and consistent weed management throughout the Clackamas River Basin.



Contract crews preparing for knotweed control.

Outreach

In support of the *Clackamas River Invasive Species Management Plan*, the Clackamas SWCD and the Clackamas River Basin Council continued a large outreach effort to private riparian landowners within the targeted demonstration areas, on properties adjacent to high priority invasive weeds, and along tributaries targeted for weed control and restoration efforts.

Nearly 800 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.

In addition, the CRISP drafted and issued a press release highlighting the signing of the CRISP MOU and invasive weed control efforts within the Clackamas River Basin. The press release was distributed to CRISP partners and media contacts.

CRISP efforts, were also presented at the Washington State Noxious Weed Control Board Coordinators Conference. CRISP Chair Sam Leininger, was also asked to give a presentation about CRISP activities and approaches. The CRISP structure and approach were highlighted for attendees and now serve as an example for analogous efforts across Washington State.

Data Management

In an effort 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.

The Clackamas SWCD also provided two trainings for the Fulcrum data collection system (<http://www.fulcrumapp.com/>). These trainings were focused toward 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. The system has also been used in a limited capacity by CRBC, NCPRD, PGE, and OPRD.

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.

Implementation

In 2018, 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 2018, CRISP partners:

- Maintained a database of location information for 22,529 weed observations from 222 species
- Maintained active site permissions for 688 private properties⁷,
- Carried out surveys on 216⁸ sites totaling more than 1379 acres⁹,
- Treated invasive weeds on over 310¹⁰ sites totaling over 4315 gross acres¹¹,
- Planted over 273,000¹² shrubs and trees at more than 115 restoration sites¹³

⁷ Reporting organizations: CRBC & CSWCD

⁸ Reporting organizations: CRBC, CSWCD, Metro, & PGE

⁹ Reporting organizations: CRBC & CSWCD

¹⁰ Reporting organizations: CRBC, CSWCD, CLT, Metro, NRCS, ODA, OPRD, & WES

¹¹ Reporting organizations: CRBC, CSWCD, CLT, Metro, NRCS, ODA, USFS, & WES

¹² Reporting Organizations: CRBC, Metro, & WES

¹³ Reporting Organizations: CRBC, CLT, Metro, PGE, & WES

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 to be highly conservative estimates of activities undertaken.

Partner Expenditures

In 2018, CRISP partners reported significant expenditures in support of weed control and restoration activities within the Clackamas River Basin. A meta-analysis of partner reported partner expenditures revealed:

- A total of 2342.75 staff hours¹⁴
- A total of \$244,308 in contracted weed control and restoration services¹⁵
- In addition to partner expenditures, \$124,785 was spent on contracted services for CRISP-sponsored projects. Twenty-one different projects were proposed by 7 partners: Clackamas County, CLT, CRBC, CSWCD, Metro, NCPRD, and OPRD. Nineteen of those projects were approved, and were then carried out in 2018.

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, the 4-County CWMA has one general meeting in Clackamas County hosted by the Clackamas SWCD. The 2018 Clackamas Meeting featured highlights of activities across Clackamas County, and many CRISP partners attended, learning about topics such as pasture management, improving communication about habitat restoration, and engaging youth in land stewardship.

¹⁴ Reporting organizations: CLT, CSWCD & Metro

¹⁵ Reporting organizations: In-Kind Services from CRBC, CSWCD, & Metro

Gene Perelli, with the OSU Extension Service, shared his knowledge for the best management of pastures. Jeff Lesh, Clackamas SWCD WeedWise specialist, provided an overview of the notable priority weeds and activities in Clackamas County. Many of these notable weed observations were either discovered or informed by CRISP-related efforts. Sam Leininger, WeedWise program manager, presented tips he has learned about communicating restoration and the problem of weeds with the public. Steve Kennett, with Dig-In Community, shared about his work engaging youth in restoration efforts and land stewardship through hands-on, field based ecology. Many of Dig-In's projects are in the Clackamas watershed.



Steve Kennett from Dig-In Community discusses his work engaging youth in restoration efforts and land stewardship

The 4-County CWMA Mapping and Data sub-committee also provided 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 2018. BLM properties near River Island along the Clackamas



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

River were targeted for control in conjunction with Metro. This area is in close proximity to a several other CRISP partner activities and has been deemed a priority in the coming years.

Efforts are currently underway with the development of an Environmental Assessment that will allow the BLM to 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 cannot 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.

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 general 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 under the greatest threat from the introduction of invasive species through human-mediated dispersal.

In 2018, priority weed control efforts on County properties were carried out in cooperation with several CRISP partners including Metro, Clackamas River Basin Council, and Clackamas SWCD. At Barton Park, Metro has been doing restoration and weed treatments since 2014, in conjunction with their work at River Island Natural Area (2018 work detailed under Metro's contributions). Metro's funding for Barton Park ended in mid-2018, and as a result of the CRISP collaboration and partnership, CSWCD was able to continue the treatments at a maintenance level to protect the years of work done by Metro.



Barton Park is one of the parks under active management within the targeted demonstration areas, and is a primary focus for mangagement due to its popularity and proximity to CRISP partner project areas..

At Fisherman’s Bend, Clackamas SWCD and CRBC collaborated to treat weeds across the entire site. Through their “Shade our Streams” program, CRBC controlled weeds to maintain and protect their prior restoration planting in the 100 foot riparian buffer. Through the CRISP, CSWCD was able to control knotweed and garlic mustard across the rest of the site.

Another area of focus is Billy Goat Island, where a caretaker has been working to clear invasive weeds and revegetate the site. CSWCD has contributed to this work through the CRISP, treating both garlic mustard and knotweed at this site.

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. Dumpstoppers provided CSWCD with dumpsite locations and these areas were surveyed in 2018 as part of the upper watershed survey and treatment project (discussed further in the CSWCD contributions below).

Clackamas County - Water Environment Services (WES)

WES supports weed control efforts in the lower portions of the Clackamas River Basin in conjunction with their RiverHealth Stewardship Grant Program, both on the natural areas they own and on site-specific restoration projects. The grants vary from year to year, but frequently involve invasive weed control activities. For the 2018-19 fiscal year, the Grant Program is funding 8 projects in total, most of which treat invasive weeds and install native plants, and others involve bank stabilization, trail access, and a workshop for landscape contractors on low-impact development stormwater facilities.

One WES-led project of note is the 15-acre Carli Creek site, a constructed wetland for storm-water treatment. Contractors completed the emergent wetland plantings in 2018, container plantings have begun, and invasive weed treatments are ongoing. CRISP partners from NCRPD and Clackamas SWCD have assisted with the Carli Creek project by reviewing specific invasive weed control plans. As this project continues to develop, additional efforts are under consideration as a potential CRISP project.



At the Carli Creek enhancement project site, contractors installed emergent wetland plants in a constructed wetland for stormwater treatment.

In 2018, WES also continued maintenance on the Rock Creek confluence site, in conjunction with the Rock Creek Partnership comprised of WES, CRBC, and Friends of Trees. This project included the removal of over 12 acres of invasive weeds, the placement of over 25 large wood structures and numerous boulders, and the planting of over 18,000 native trees and shrubs. This project stretches up from the confluence of Rock Creek and the Clackamas River and covers 2,000 linear feet of the stream. Restoration efforts have increased stream complexity for enhanced protection of juvenile salmon before they migrate to the ocean. In support of this project, the Rock Creek Partnership hosted a “Discover Rock Creek” event to educate local residents about the ongoing weed control and restoration efforts.

In addition, WES conducts baseline-level monitoring and maintenance, including invasive species control, on the Rose Creek Natural Area (approximately 5.6 ac) it owns within the Clackamas basin. WES plans other stream restoration projects that include managing invasive species on project sites.

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, it helps to protect the important investment of the Shade Our Streams properties by reducing future invasive species and EDRR weeds 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 our restoration sites is accessed with an eye towards EDRR weeds and potential participation in the CRISP program.

The key EDRR weeds treated on CRBC’s CRISP and Shade Our Streams sites were knotweed, meadow knapweed, false brome, and garlic mustard. Five of the knotweed treatment sites on Deep Creek were in their second year of treatments and showed, on average, an 80% reduction. On one particular stretch (highway 211 to Boitano Rd), only one landowner refused participation, while other private landowners have been happy and sharing their successes with neighbors who might not have originally signed up with the program. New adjacent landowners are already being signed up for the 2019 treatment season.

Other Notable activities accomplished by the CRBC in 2018 include:



A Clackamas riparian property after 2 years of weed treatment.

- Surveyed 23 sites, totaling 67 acres. Included in these surveys were 4.5 miles of streamside properties on Deep Creek, 2 acres of upland property, and 20 acres of existing Shade our Streams properties on the Clackamas
- Treated CRISP priority weeds at 20 sites along Deep Creek and the Clackamas
- An additional 120 acres (14 stream miles) were treated through the Shade our Streams program.
- Worked on various phases of 90 different restoration projects. This includes over 200,000 native trees and shrubs planted, 9.29 river miles restored, and 2 side channel reconnection projects enhanced.
- Sent 92 pieces of outreach information to potential partnering landowners. To landowners already participating, 3 additional pieces of educational material were provided (Information on invasive weeds, knotweed treatment, and pesticides program), as well as an invitation to educational workshops.
- Hosted multiple landowner educational workshops including: “What’s in My Stream?” “Living with Wildlife,” “Naturescaping at Home,” and “Healthy Streams and Forests”



CRBC has been treating knotweed along Deep Creek, a tributary to the Clackamas, since 2017. The left side of the creek shows untreated knotweed (landowner declined participation), while the right demonstrates the results after one year of treatment.

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>).

In 2018, the Clackamas SWCD WeedWise program served 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 Clackamas SWCD 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*.



WeedWise staff hosted a training for contractor crews and CRISP partners on data collection and invasive weed identification.

In 2018, the Clackamas SWCD continued its focus on education and outreach to support the CRISP. The CRISP coordinator gave a presentation to the Garlic Mustard Working Group, highlighting the importance of partnership and collaboration. The WeedWise program also hosted their annual contractor and partner training, focusing on invasive weed identification and data collection. In addition to website posts about the

CRISP and the upper watershed surveys, the WeedWise program also featured a monthly update of CRISP-related activities in its monthly newsletter known as the “Prickly Thistle”, as well as on social media. These regular updates are intended to inform the general public and help to raise awareness about current CRISP efforts.

The WeedWise program also initiated two landowner mailings, sending 692 letters to private landowners within the targeted demonstration area along the Clackamas River, along Clackamas tributaries, and others in close proximity to known priority weed locations. These letters resulted in 158 new landowner permissions, which allowed Clackamas SWCD to find new weed observations and begin weed treatments.

Notable activities in 2018 undertaken by the Clackamas SWCD WeedWise program within the Clackamas River Basin include:

- Surveyed 44 locations in the upper watershed with a focus on dump sites, construction sites, decommissioned roads, and around the Collawash false brome infestation. These surveys identified

new observations of false brome, knapweeds, knotweed, bishop's goutweed, English holly, shiny geranium, and Himalayan blackberry;

- Carried out 367 invasive weed control treatments at 189 different sites, with total gross size of 816 treated acres and a net infested size of 79 acres;

- Treated knotweed on 64 knotweed sites on the Clackamas River upstream from Richardson Creek, in the Eagle Creek Basin, lower Deep Creek, and along Middle/Upper Clear Creek;

- Treated garlic mustard on 76 sites;

- Weed treatments in the lower watershed: false brome (35 sites), purple loosestrife (12 sites), spurge laurel (10 sites), sulfur cinquefoil (10 sites), policeman's helmet (9 sites), oblong spurge (5 sites), orange hawkweed (5 sites), meadow hawkweed (4 sites), giant hogweed (2 sites), goatsrue (2 sites), milk thistle (1 site), and Japanese butterbur (1 site);

- In the upper watershed, CSWCD treated false brome (4 sites), spotted knapweed (4 sites), diffuse knapweed (3 sites), meadow knapweed (2 sites), shiny geranium (2 sites), black locust (1 site), houndstongue (1 site), and rush skeleton weed (1 site).

- Surveyed 121 sites in the lower watershed for a total of 1313 surveyed acres across the entire basin;

- Maintained a total of 22529 weed observations within the basin for 222 invasive weed species, adding 1380 new observations in 2018;

- Maintained 708 active permissions with private landowners;

- Invested 1705.75 hours of total staff time on CRISP-related activities;

- Spent a total of \$131,995 on contracted services inside the Clackamas Basin (\$95,290 on CRISP-approved projects and \$36,705 on in-kind contributions towards contracted services).



Dead knotweed canes and partial regrowth after one year of treatment on Dubois Creek, a tributary of the Clackamas. Knotweed is a damaging riparian invasive weed that takes multiple years to control.



*Contracted crews controlling garlic mustard (*Alliaria petiolata*), in a riparian forest. Through CRISP, CSWCD has been able to significantly increase control efforts for this highly invasive weed.*

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



A clearing in the center of the McGahan site. This area was previously infested with Himalayan blackberry and is now dominated by native plants.

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 the CRISP in late 2017. In 2018, CLT dedicated 37 staff hours to CRISP-related activities.

In 2018, the CRISP funded two rounds of weed control at the 23-acre McGahan site. Work included herbicide applications and manual

control. Target species included false brome (*Brachypodium sylvaticum*), garlic mustard (*Alliaria petiolata*), spurge laurel (*Daphne laureola*), ivy (*Hedera hibernica*; *H. helix*), yellow archangel (*Lamium galeobdolon*), English holly (*Ilex aquifolium*), Himalayan blackberry (*Rubus armeniacus*), tansy ragwort (*Jacobaea vulgaris*), thistle (*Cirsium* spp.) and empress tree (*Paulownia tomentosa*).

Columbia Land Trust staff are also continuing to restore habitat by planting and maintaining native vegetation in small areas along the property boundaries where neighbors' yards and structures have encroached on the natural area in the past.

In August 2018, Land Trust staff installed two new signs at entrances to the property. In the fall of 2018, a Land Trust volunteer completed a trail inventory on the McGahan Natural Area and identified site access points, potential routes for a new connector trail, and potential locations for interpretive signage and boot brushes.

Metro

Building on the accomplishments of previous years, Metro controlled a variety of invasive weeds across its properties in 2018. In the Clackamas Basin, sites included Bakers Ferry, Barton, Cazadero, Cazadero North, Clackamas Bluffs, Clear Creek Canyon, Clear Creek North, Jonsson Center, Deep Creek North



Purple loosestrife infestation prior to treatment. Early detection of this invasive species is crucial to successful eradication.

Fork, Deep Creek North Fork Forest, North Logan, Richardson Creek, and River Island Natural Areas, and Clackamas County's Barton Park were the focus of extensive weed management work.

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.

Metro's 2018 contributions to the CRISP include direct funding of CRISP staff (i.e. cash match), planning support, and weed control (i.e. in-kind match).

In 2018, Metro initiated the following activities:

- 14 properties surveyed and treated
- 1,752 total site acres under management (including Barton Park weed management for Spring of 2018)
- Over 28 species managed including: Italian arum (*Arum italicum*), blackberry (*Rubus bifrons*), black locust (*Robinia pseudoacacia*), butterfly bush (*Buddleja davidii*), old man's beard (*Clematis vitalba*), false brome (*Brachypodium sylvaticum*), garlic mustard (*Alliaria petiolata*), 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.), yellow archangel (*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 600 staff hours invested
- Invasive control utilizing five contractors, with receipts totaling \$130,000.
- Native plantings and plant maintenance utilizing eight contractors, with receipts totaling over \$113,000.
- \$30,000 in Metro CRISP cash match

Additional notes of interest:

- Metro planted 55,000 native trees and shrubs, 1100 pounds of native seed and 14,000 native plugs and bulbs throughout the 14 Clackamas River sites in 2018.
- Three new EDRR weeds were detected and treated on Metro sites; American pokeweed (*Phytolacca Americana*) along North Fork Deep Creek, policeman's helmet (*Impatiens glandulifera*) at Bakers Ferry, and milk thistle (*Silybum marianum*) at Richardson Creek.
- Barton Park weed management was successfully handed off from Metro to the CRISP partnership from long term maintenance of high priority weeds.



Richardson Creek – Metro continues weed control and revegetation efforts at Richardson Creek Natural Area after the large restoration project completion in the Summer of 2018. Photo depicts an unnamed tributary that flows into Richardson Creek south of Highway 224.

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*)
- Site wide: knotweed (*Fallopia japonica*, *F. sachalinensis*, and *F. × bohemica*), butterfly bush (*Buddleja davidii*), knapweed (*Centaurea* sp.), ivy (*Hedera hibernica* & *H. helix*)

Barton Park

- EDRR: garlic mustard (*Alliaria petiolata*), poison hemlock (*Conium maculatum*), Italian arum (*A. italicum*)
- Site wide: false brome (*Brachypodium sylvaticum*), butterfly bush (*Buddleja davidii*), spurge laurel (*Daphne laureola*), Scotch broom (*Cytisus scoparius*). Summer and fall invasive species treatments implemented by CRISP leadership.

Barton Natural Area

- EDRR: knotweed (*Fallopia japonica*, *F. sachalinensis*, and *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*, and *F. × bohemica*), Yellow archangel (*Lamium galeobdolon*)
- 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*, and *F. × bohemica*), Italian arum (*Arum italicum*), butterfly bush (*Buddleja davidii*) Yellow archangel (*Lamium galeobdolon*)
- 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 (*Senecio vulgaris*)

Clackamas Bluffs

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

Cazadero North

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

Deep Creek North Fork

- EDRR: knotweed (*Fallopia japonica*, *F. sachalinensis*, and *F. × bohemica*), Italian arum (*Arum italicum*), American pokeweed (*Phytolacca americana*) - Arum trials continue and there has been an observable reduction in the average size of individual plants (smaller leaves this year) but no significant observable change to arum cover or distribution.
- Site Wide: ivy (*Hedera hibernica* & *H. helix*), periwinkle (*Vinca* sp.)

Deep Creek North Fork Forest

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

Jonsson Center

- EDRR: yellow archangel (*Lamium galeobdolon*), knotweed (*Fallopia japonica*, *F. sachalinensis*, and *F. × bohemica*)

- Site Wide: false brome (*Brachypodium sylvaticum*), ivy (*Hedera hibernica* & *H. helix*), periwinkle (*Vinca* sp.), and Scotch broom (*Cytisus scoparius*)

North Logan

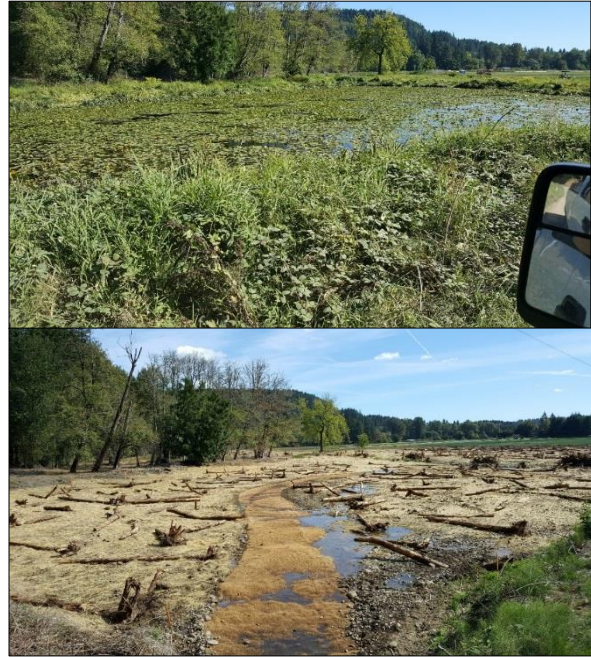
- EDRR: knotweed (*Fallopia japonica*, *F. sachalinensis*, and *F. × bohemica*), lesser celandine (*Ranunculus ficaria*, close to eradication), butterfly bush (*Buddleja davidii*), meadow knapweed (*Centaurea × moncktonii*), garlic mustard (*Alliaria petiolata*)
- Site wide: false brome (*Brachypodium 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, knotweed (*Fallopia japonica*, *F. sachalinensis*, and *F. × bohemica*), false brome (*Brachypodium sylvaticum*), milk thistle (*Silybum marianum*) – a new population found and treated in 2018.
- Site wide: old man's beard (*Clematis vitalba*), periwinkle (*Vinca* sp.), ivy (*Hedera hibernica* & *H. helix*), blackberry (*Rubus bifrons*), reed canary grass (*Phalaris arundinacea*)

River Island

- EDRR: knotweed (*Fallopia japonica*, *F. sachalinensis*, and *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*)



Richardson Creek Natural Area – Before and After - Pond filled with invasive species such as yellow flag iris, fragrant water lily, reed canary grass, and blackberry were restored to wetland habitat in 2018 and will be planted with native wetland rushes, sedges, and shrubs in the winter of 2019.

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



Before and after photos at a Clackamas SWCD oak restoration site where NRCS controlled blackberry.

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.

In 2018, NRCS spent \$21,775 in cost share funds to treat 132 acres through the use of 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 18 different contracts with private landowners.

In the coming years, NRCS would like to work toward a livestock 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 District routinely manages their property for weeds as part of their ongoing park maintenance activities.

In managing established parks, NCPRD serves at the interface between the general public and natural areas within urban portions of the Clackamas River Basin. They provide a unique opportunity to promote outreach and education efforts to the public. These parks and green spaces are also under the greatest threat from the introduction of invasive species through human induced movement.

In addition to managing their own parks and natural areas for invasive weeds, NCPRD also serves as a technical resource to other CRISP partners and has



NCPRD natural areas manager, Tonia Williamson, discusses restoration activities at the Fisherman's Bend project site.

provided feedback to WES in development of its Carli Creek invasive weed management plan.

Oregon Department of Agriculture- Noxious Weed Program (ODA)

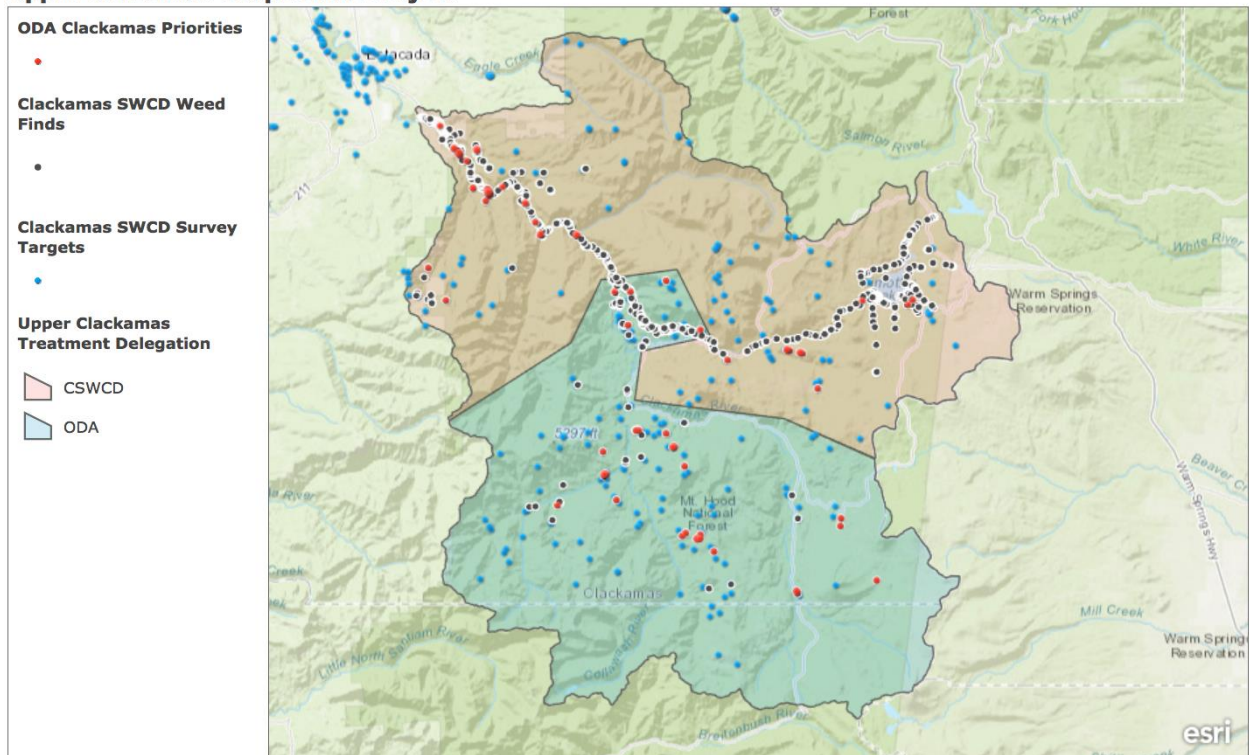
The ODA Noxious Weed Control Program serves a leadership role in managing invasive species at the state level, providing regular guidance related to risk assessment and noxious weed listings to help protect the state from new invasive weeds.

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. In 2018, ODA’s main focus in the Clackamas Ranger District was addressing priority weed finds resulting from the intensive survey commissioned by Clackamas SWCD in 2017.

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. Staff from both agencies teamed up to address a spreading population of false brome in the remote Collawash drainage near Bagby Hot Springs. ODA also monitored and treated previously known sites in the Ranger District

Upper Clackamas Cooperative Project



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

as needed, and nearly all these areas were showing excellent control or were absent of plants, with the exception of false brome in the Collawash area. Areas of treatment included Highway 224/Road 46, Timberlake Job Corps campus, Ripplebrook Rd. 4631 & 4635, Bagby Hot Springs Rd. 70 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

By the numbers:

- Treated 1.2 net acres over 540 gross acres
- 57 sites treated

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*) and false brome (*Brachypodium sylvaticum*). Milo McIver State Park has been identified as the upstream-most infestation of both of these priority invasive weeds in the Clackamas River Basin, and therefore, control and management of these weeds are of particular importance. Other target invasives are yellow archangel, meadow hawkweed, English ivy and Old Man's Beard.

In early 2017, OPRD staff met with Clackamas SWCD's Lindsey Karr and Integrated Resource Management's Matt Mellenthin to discuss strategy in the coming years for false brome control at Milo McIver State Park, and get a better understanding of CRISP-priority species occurrences around McIver. OPRD continued efforts in 2018 to target false brome within the park, working the outlying patches, trailheads, trails, and other vector areas. The decision was made to begin targeting the dense central false brome infestation beginning in 2018, using pre-emergent herbicide in certain areas.

Garlic mustard is the second priority species that was targeted in 2018, continuing multiple years of effort to hand pull or spot spray every garlic mustard plant discovered within the park. OPRD was successful at obtaining CRISP funding to support this work, complementing the OPRD funding dedicated to the project.

At Bonnie Lure State Recreation Area, located at the confluence of the mainstem Clackamas and Eagle Creek, OPRD partnered with Clackamas River Basin Council (CRBC) on a new effort focused on invasive species control and riparian and floodplain forest establishment. CRBC was successful at obtaining funding for the project, and project activities will get underway in 2018. OPRD staff also kept a lookout for other CRISP priority weed species in its Clackamas basin properties.

OPRD also serves at the interface between the general public and natural areas within the Clackamas River Basin. They have a genuine opportunity to promote outreach and education efforts to the general public.

Portland General Electric (PGE)

In 2018, Portland General Electric has been active in the Clackamas River Basin implementing their Vegetation Management Plan (VMP), in accordance with their Federal Energy Regulatory Commission license requirements. Implementation of the VMP includes three interrelated programs:

- 1) Vegetation Maintenance Program,
- 2) Invasive Non-native Plant Species Prevention and Control Program, and
- 3) Revegetation Program.

PGE staff conducted manual control and employed a licensed contractor to conduct herbicide treatments of invasive non-native plants at multiple locations within the MHNH during 2018. Invasive non-native plant infestations were treated with herbicides consistent with the project design criteria in the Final Environmental Impact Statement (FEIS) for Site-Specific Invasive Plant Treatments for MHNH and Columbia River Gorge National Scenic Area (2008), including use of approved herbicides only. PGE and the contractor coordinated with the MHNH botanist prior to the work. PGE also conducted routine invasive non-native control work at facilities sites on PGE land outside of the MHNH.

An invasive non-native plant inventory is required every three years under PGE's Clackamas Hydro Project Vegetation Management Plan. Pacific Crest Consulting completed terrestrial surveys in 2017 of all high-probability areas within the project boundary during August-November, and PSU Center for Lakes and Reservoirs completed aquatic surveys in Project waters during August 2017. The 2017 survey confirmed 18 invasive non-native plant species within the project boundary and there are 26 species now known to occur in or near the Project. No invasive non-native aquatic plants were identified in Estacada Lake, Faraday Lake, North Fork Reservoir, Lake Harriet, or Timothy Lake during 2017 surveys. The next surveys will be conducted in 2020.

In addition to the efforts undertaken by PGE in accordance with their FERC relicensing, PGE also supported CRISP efforts through administration of the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund*. In 2016, the Clackamas SWCD was awarded a 5-year grant totaling \$431,250 for on-the-ground implementation of CRISP-related activities. These resources will greatly enhance the ongoing efforts across the Clackamas River Basin and help address gaps in current management identified by partnering organizations.

Revegetation and monitoring at multiple sites

PGE conducted initial or follow-up revegetation (two sites) and related monitoring (14 sites) during 2018 where project-related construction, recreation improvements or habitat-restoration activities have created disturbed soil. All sites are monitored annually for a minimum of three years to ensure revegetation success, and control measures are conducted as appropriate to prevent establishment of

invasive non-native plants in revegetated areas.



North Fork Wetland Restoration Project near Estacada, Or.

United States Forest Service- Mt Hood National Forest

The US Forest Service works in cooperation with a number of 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 2018, the MHNF spent an estimated \$350,000 on invasive plant management program. These funds were mostly generated from timber sale receipts, with the rest coming from appropriated sources.

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, Oregon Department of Transportation, and Bonneville Power Administration. In 2018, these treatments equated to over 900 gross acres of noxious weed control in the Clackamas River Basin.

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 MHNH is also committed to increasing awareness of invasive species and promoting early detection and rapid response of new invasive weeds. In 2018, the MHNH partnered with the Pacific Northwest Invasive Plants Council and Clackamas SWCD to host an early detection training for Forest Service staff, partner agencies, and the general public. Also the Forest Service has partnered with Play, Clean, Go, Wild Spotter, and EDDMaps West.

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 2018. The success of the CRISP is a reflection of 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!

