

# 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.



# Acknowledgements

This annual report has been developed on behalf of the *Clackamas River Invasive Species Partnership* (CRISP). In 2017, 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 from 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

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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 between partners.

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 2017, the CRISP continued its efforts to increase cooperative management approaches outlined in our *Clackamas River Invasive Species Management Plan*.

Over the last year, CRISP has enhanced partner coordination in the upper portions of the Clackamas River Basin. In this area, federal, state, county, and regional partners have been working collectively to systematically target high priority noxious weeds. A concerted effort has been underway to survey areas with a high potential for the introduction of new invasives. This effort has resulted in the detection of a several new high-priority weed infestations.

In addition the work in the upper watershed, the CRISP has also increased coordination amongst partners working along the mainstem Clackamas River. Active weed management efforts are underway from partners from Milo McIver to Carver. In particular, CRISP partners have worked to coordinate private landowners in these areas to increase connectivity of actively managed properties. This has also helped to raise public awareness about the CRISP efforts as well as bolster existing efforts in our open spaces and natural areas.

These collaborative efforts allow the CRISP to utilize the unique strengths and expertise of our partnering organizations to improve conditions across the Basin.

## 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 invested significant cash and in kind contributions over the last year. In total, the CRISP partners reported expending \$453,989 in contracted weed control and restoration services in 2017.

The total estimated CRISP-related personnel services reported by partners in 2017 totaled 755 hours. This work supported weed surveys and treatments on over 6298 acres of public and private land<sup>1</sup>.

With many of the gaps in management occurring on private lands, the CRISP partners increased outreach to private landowners to increase management of priority weeds. In 2017, CRISP sent 1,979 letters to private landowners inviting participation in CRISPrelated weed survey and treatment activities.<sup>2</sup>

## Growing the Partnership

After adoption of the CRISP *Memorandum of Understanding* (MOU) in 2016, partner organizations have continued to refine and develop how we work and collaborate together.

In the last year, the CRISP welcomed the addition of Columbia Land Trust as a formal partner. With the addition of Columbia Land Trust, the CRISP now includes 14 signatories to the CRISP Memorandum of Understanding (MOU).

The addition of a new partner, and the sustained interest in our activities, 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 in 2017.

The CRISP specialist supports activities between partners and is spearheading implementation of weed control projects throughout the watershed. This coordinated implementation has greatly enhanced the work of the CRISP.

## Looking Ahead

The past year has proven to be highly productive for the CRISP. Activities initiated early in the partnership have steadily taken form, and we are poised to continue to build upon this success.

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 2018, we look forward to building upon our accomplishments to supporting a healthier Clackamas River Basin.

<sup>&</sup>lt;sup>1</sup> This number accounts for surveys and weed treatments reported by the following partners: CRBC, CSWCD, CLT, Metro, NRCS. ODA, OPRD, and WES.

<sup>&</sup>lt;sup>2</sup> These numbers only account for letters sent by Clackamas River Basin Council and Clackamas SWCD.

# 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, 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;



Figure 1. Clackamas River Invasive Species Management Plan was completed in 2015

- 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;
- Outline a strategy to use limited resources to accomplish measureable, impactful, and lasting improvements within the basin.

The Clackamas River Invasive Species Management Plan defines a long-term, basinwide 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 annual report documents the approach, activities, and accomplishments of the CRISP over the last year. This report documents the activities and accomplishments of 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 Clackamas 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 three large dams that provide electricity, water storage, and flood control.



Figure 2. 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.



Figure 3. Rare species like cold water corydalis (corydalis aquae-gelidae) are under continued threat from Invasive species.

#### 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)<sup>3</sup>.

#### Tree Cover

The native forest canopy provides the lowest cost, most sustainable form of temperature

<sup>&</sup>lt;sup>3</sup> 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.

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, Fallopia sachalinensis*).

#### Soil Health

Some invasive plants are 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



*Figure 4. Invasive weeds like garlic mustard (Alliaria petiolata) threaten the natural regeneration of riparian forests.* 

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)<sup>4</sup>. For many farmers, controlling invasive species in their fields can be one of the most time consuming and expensive aspects of producing a crop. The additional labor costs and chemical application costs associated with controlling invasive species on farms 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)<sup>1</sup>. These losses impact society both directly and indirectly. They reduce productivity and increase costs on both the farm and in the forest. They reduce water quality and increase the need for costly infrastructure to clean and manage both stormwater and drinking water. They reduce the diversity of species in native habitats, sometimes requiring costly intervention in

<sup>&</sup>lt;sup>4</sup> 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.

order to prevent species from becoming threatened or endangered. Invasive species can also reduce the value of land and interfere with desired land uses. Invasive species 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



Figure 5. Boot brushes are one tool to prevent the introduction and spread of invasive species.

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.

## 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 basinwide.

#### 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, development of informational signage, installation of boot cleaning stations, requiring machinery to be cleaned before and after mobilization to a site, use of weed-free straw and gravel, as well as other strategies.



*Figure 6.* The control of invasive species uses a variety of control practices based on the ecology of the target pest and site specific conditions.

#### 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.

#### 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 recolonization 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, Fallopia* spp., and *Brachypodium sylvaticum*.

The WHIPPET model prioritized infestations based on their relative impact, invasiveness, and feasibility of eradication. The resulting patch prioritization then served as a tool to improve implementation at both the local and regional scales.

Enhancements to the CRISP-adapted WHIPPET model were planned for 2017, but were not completed due to time constraints. Anticipated improvements to the model include an expansion of invasive weed assessed, a normalizing of survey intensity, and inclusion of new observation data.



Figure 7. WHIPPET model score distributions for 19 target species evaluated.

#### Geographic Prioritization

The Clackamas River Invasive Species Management Plan applies to the entire 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 also prioritized specific geographic areas for action. They ranked sub-watersheds as high, medium or low priority based on:

- data from the Intertwine Alliance's Regional Conservation Strategy (<u>http://www.theintertwine.org/projects</u> /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 demonstration areas including the stretch of land along the Clackamas River from the Carver Boat Ramp to Barton Park, the area between Barton Park and Milo McIver State Park, and a small urban area in Happy Valley near Sieben Creek (Figure 8).



*Figure 8. The 2017 CRISP targeted demonstration areas in the Clackamas River Basin.* 

# Accomplishments

The many activities undertaken by CRISP in 2017 demonstrate the growing strength of the partnership. This past season was the first 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.

In addition to these funds, the CRISP was able to hire a dedicated specialist position housed within the Clackamas SWCD, WeedWise program to help with coordination and implementation of CRISP-related projects.

The 2017 field season, also allowed CRISP to implement strategies identified in the *Clackamas River Invasive Species Management Plan.* In particular, improved coordinated activities within the targeted demonstration areas, has allowed CRISP to close gaps in management and enhance existing efforts.

Early detection efforts in the upper watershed have also yielded significant discoveries of priority weeds. These new observations help to buffer other areas of the watershed and help protect high quality areas, sensitive to invasion.

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 establishment of CRISP has enhanced these efforts significantly over the last year.

## Memorandum of Understanding

In 2017, the CRISP participating organizations ratified the *Clackamas River Invasive Species Partner, Memorandum of Understanding*. This document formalizes the CRISP and establishes a framework for the partnership to work more collaboratively.

The MOU was drafted in late 2016, and was then reviewed and signed by 13 CRISP partners in the spring and early summer of 2017. Following this initial signing the CRISP also added a 14th member in December of 2017.

Following the ratification of the CRISP MOU, the members nominated and elected Sam Leininger, Clackamas SWCD WeedWise Program Manager as CRISP chair and Peter Guillozet, Metro Scientist as vice chair to oversee CRISP.

In an effort to continue growing the partners, the CRISP continues to reach out to organizations actively working within the Clackamas River Basin. The desired outcome of this effort is to engage other land management entities to continue to improve coordination and close gaps in management.

## Meetings and Coordination

Following development of the *Clackamas River Invasive Species Management Plan*, the CRISP partners established a summer and winter meeting schedule for the CRISP. In July 2017, the Clackamas SWCD hosted the summer CRISP meeting to discuss CRISP partner activities. The event was attended by 13 representatives from nine participating organizations. The summer meeting unveiled a suite of new developments including:

- Ratification of the CRISP MOU;
- Update on the Clackamas River Hydroelectric Project Mitigation and Enhancement Fund grant;
- A discussion of planned revision of the *Clackamas River Invasive Species Management Plan*;
- A review of weed observation and survey data, and a review of data quality standards;
- Updates from CRISP partners about spring 2017 activities and ongoing efforts;

The CRISP also held a winter meeting in December 2017 at the Clackamas SWCD office. This meeting was attended by 16 representatives from eleven organizations. The winter meeting updated partners on a number of CRISP related developments including:

- The addition of a new member organization to the CRISP MOU;
- An update on the Clackamas River Hydroelectric Project Mitigation and Enhancement Fund grant;
- A discussion of the CRISP contractor pool, and its potential use by partner organization during project implementation;
- A discussion of the Clackamas River Invasive Species Management Plan revision;

- Formal election of CRISP Co-Chairs per the MOU;
- Updates from CRISP partners about fall 2017 activities and ongoing efforts.
- A discussion of the potential to install boot brushes at several trailheads.
- A review of proposed CRISP-led spring 2018 projects
- A review of activities within the priority sub-basins.

CRISP coordination has been bolstered through the establishment and 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.

## Grants and Funding

This past year was the first full year of implementation of resources allocated from the PGE administered *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund*.

In conjunction with the resource, CRISP partners have dedicated an additional \$70,000 in cash contributions in 2017 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.

In addition to these cash contributions, CRISP partners documented an additional \$354,735 in contracted weed control and restoration services, and documented 1026 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 for implementation of the Clackamas River Invasive Species Management Plan.

The Clackamas SWCD prepared a grant proposal to the Oregon Watershed Enhancement Board (OWEB) administered Oregon Noxious Weed Board to support priority weed control efforts in the Clackamas Basin.

CRISP BUDGET SUMMARY			
REVENUE SOURCE			
PGE	\$431,250		
Metro	\$37,358		
BLM	\$5,000		
Mt Hood NF	\$0		
CSWCD	\$35,000		
TOTAL REVENUE	\$508,608		
EXPENSES			
Contracted Services	\$99,254		
CRISP Sponsored Projects	\$99,254		
Personnel Services	\$70,327		
CRISP Specialist	\$55,653		
CRBC Services	\$14,674		
TOTAL EXPENSES	\$169,581		
PROJECTED BALANCE	\$339,026		
IN KIND CONTRIBUTIONS			
DOCUMENTED SOUDCES			

DOCOMENTED SOONCES	
Contracted Services	\$354,735
CSWCD Contracted Services	\$55,590
Metro Contracted Services	\$140,555
CRBC Contracted Services	\$158,590
Personnel Services (hrs)	1,026
CSWCD Personnel (hrs)	555
Metro Personnel (hrs)	300
CRISP Partners (hrs)	171

*Figure 9. Documented revenue and expenses from CRISP partners in 2017.* 

Unfortunately, during the contract review stages prior to submission of the grant proposal, it was determined that OWEB's new pollution insurance requirements were not obtainable through the state insurance pool. A vendor was found from outside sources, but the cost was prohibitively expensive, and thus, the grant could not be submitted.

Clackamas SWCD submitted information related to issue, to the Oregon Department of Agriculture, the Oregon State Weed Board, and to the Oregon Watershed Enhancement Board regarding this issue. Our hope is that this issue can be reconciled for future funding cycles.

The CRISP has also been discussing submit a funding request for Retained Receipts funding from the Mt Hood National Forest. These resources would be used to offset contractor costs in the upper portions of the Clackamas River Basin. This request will be submitted in the spring 2018 funding request for implementation in 2019.

## Plan Maintenance

The *Clackamas River Invasive Species Management Plan* was completed in 2015 and no significant changes were made in 2017.

Although no changes were made in 2017, there was interest amongst CRISP partners to begin a review process. Specifically there was interested in updating the WHIPPET prioritization model to incorporate new data, include additional species, and to improve model parameters related to survey intensity.

There was also interest in reviewing the priority sub-basin management priorities. This will be an increasing need as the CRISP continues to learn more about current conditions within the Clackamas River Basin. The preliminary revision process initiated in 2017 is currently waiting WHIPPET model revisions to help inform the process. Additional revisions are planned for 2018, pending completion of WHIPPET model updates.

## Partner Contracting

Clackamas SWCD on behalf of CRISP invested significant resources in developing and administering contracts and agreements between funders and partners in 2017.

This included distributing and compiling the CRISP MOU, administering the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* and associated agreements with Metro, PGE, RBC, and BLM.

## Staffing

In December 2016, the Clackamas SWCD hired a CRISP-dedicated specialist position to assist with implementation of the CRISP-related activities.

With the hiring of Lindsey Karr for the CRISPdedicated specialist position, early 2017 was focused on orienting Lindsey and developing connections with CRISP partners. The timing was ideal and Lindsey was able to hit the ground running and started implementing weed control projects at the start of the 2017 field season.

In 2017, Lindsey also helped to develop a basic project proposal form and process, to assist CRISP partners with new project development, and to facilitate discussion and prioritization between CRISP members. This process resulted in 18 submitted projects by five different partners.



Figure 10. WeedWise Specialist, Lindsey Karr was hired to assist with CRISP implementation.

Having this CRISP-dedicated position has greatly enhanced our efforts, and helped to bolster activities of CRISP member organizations. We have been able to get an immense amount of work completed, and it has freed some partner staff time associated with implementation of CRISP-led projects.

The demonstrated return on investment associated with the CRISP dedicated position, shows a need for continued support for this position.

### 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 2017, the Clackamas SWCD maintained notto-exceed contracts with 11 professional weed control, restoration, and botanical survey contractors. The contract prices were secured competitively through a Clackamas SWCD RFP. 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.

While use of the contractors is straightforward for CRISP led projects, non-CRISP funded projects requires a partner agreement with Clackamas SWCD. This option was not exercised in 2017 and an agreement will be developed pending additional interest by CRISP partners.

## **CRISP** Partnership Projects

In 2017, CRISP partners were able to initiate a new process for referring CRISP-led field projects for implementation through the *Clackamas River Hydroelectric Project* 

#### Mitigation and Enhancement Fund.

This new project development process has allowed the CRISP to take advantage of partner familiarity with on-the-ground needs. It has also provided a feedback loop amongst CRISP partners to help ensure that the positive impact of our resources is maximized.

#### 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 2000 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.



Figure 11. Contract crews preparing for knotweed control.

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 three trainings for the Fulcrum data collection system (http://www.fulcrumapp.com/), two of these trainings were focused toward interested CRISP partners, and a third was focused on contractors in the CRISP contractor pool. 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, 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 2017, 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 2017, CRISP partners:

- Maintained a database of location information for 18,422 weed observations from 222 species,
- Maintained active site permissions for 598 private properties<sup>5</sup>,
- Carried out surveys on 512<sup>6</sup> sites totaling more than 2254 acres<sup>7</sup>,
- Treated invasive weeds on over 172 sites totaling over 4044 gross acres<sup>8</sup>.

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

#### Partner Expenditures

In 2017, 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 755 staff hours<sup>9</sup>

<sup>&</sup>lt;sup>5</sup> Reporting organizations: CRBC & CSWCD

<sup>&</sup>lt;sup>6</sup> Reporting organizations: CRBC, CSWCD, Metro, & PGE

<sup>&</sup>lt;sup>7</sup> Reporting organizations: CRBC & CSWCD

<sup>&</sup>lt;sup>8</sup> Reporting organizations: CRBC, CSWCD, CLT, Metro, NRCS, ODA, OPRD, PGE, &WES

<sup>&</sup>lt;sup>9</sup> Reporting organizations: CSWCD & Metro

- A total of \$354,735 in contracted weed control and restoration services<sup>10</sup>
- In addition to partner expenditures, \$99,254 was spent on contracted services for CRISP-sponsored projects. Eighteen different projects were proposed by 5 partners: Clackamas County, CRBC, CSWCD, Metro, and OPRD

CRISP expenditures exceeded this annualized allotment, in part to compensate for savings realized in 2016 due to delays in grant and partner contracting. These savings have allowed the CRISP to greatly increase contracted implementation costs in 2017.

## Weed District

In 2016, there was significant discussion related to the potential reformation of a regulatory weed district in Clackamas County. A weed district would allow for the enforcement of noxious weeds at the county level. This effort was undertaken in response to potential funding for county weed programs from the Oregon Department of Agriculture.

The Clackamas SWCD, WeedWise program and staff from Clackamas County met with one County Commissioner to discuss the potential of forming a weed district.

Both parties agreed to investigate the idea further. To inform discussions, the WeedWise program initiated a review and survey of weed districts across the state to inquire about potential structure and funding strategies.

There was a subsequent discussion with the interested commissioner and the Clackamas SWCD Board of Directors to discuss the idea.

These discussions, and the allocation of dedicated funds, resulted in the Clackamas SWCD WeedWise program being designated at the "Weed Entity" for Clackamas County in December of 2017.

The "Weed Entity" designation lacks the regulatory authority of a noxious weed control district, but allows the Clackamas SWCD to seek county designated funding through the Oregon State Weed Board, and administered by the Oregon Watershed Enhancement Board.

OF CLACKAM	ASEGUNIT, STATE OF OREGON
A Resolution for the Designation Of the Clackamas Soil and Water Conservation District as Weed Entity	RESOLUTION NO. 2017-15
WHEREAS, Clackamas County our economic viability, community livabil	recognizes the damaging impact of invasive noxious weeds on ity, and integrity of our natural systems; and
WHEREAS, the State of Oregon public nuisance; and	has enacted ORS Chapter 569 declaring noxious weeds as a
WHEREAS, the Oregon Departm of almost \$83,500,000 in personal inco species; and	nent of Agriculture has found there is an estimated annual loss me to the State's economy from 25 selected noxious weed
WHEREAS, the Oregon State V noxious weed program or the county we	Veed Board has created a grant program to support a county ed entity designated by the County Commissioners; and
WHEREAS, the Clackamas Soil in part to respond to citizen demands to and sustainable control methods; and	and Water Conservation District received a permanent tax rate, implement a countywide weed program focused on education
WHEREAS, the Clackamas Soil wide noxious weed program, that serves County; and	and Water Conservation District currently operates a county- landowners, businesses, and residents throughout Clackamas
WHEREAS, Clackamas Count Clackamas Soil and Water Conservat projects, programs, and practices that m	<li>through its Departments, works cooperatively with the ion District to identify and implement noxious weed control neet mutual goals; and</li>
WHEREAS, the Clackamas Be demonstrated ability of the Clackamas for Clackamas County,	pard of County Commissioners recognizes the current and Soil and Water Conservation District to act as the weed entity
NOW, THEREFORE, BE IT RE: designates the Clackamas Soil and Wa and enhance the management of invasi	SOLVED that the Clackamas Board of County Commissioners ter Conservation District as the county weed entity to improve ve noxious weeds within Clackamas County.
DATED this 14 day of Decemb	<u>* /</u> , 2017.
BOARD OF COUNTY COMMISSIONER	RS
Chair Chair	- 7>
Recording Secretary	2

Figure 12. Clackamas County Resolution 2017-151 designating the Clackamas SWCD as the Weed Entity for Clackamas County.

 $<sup>^{\</sup>rm 10}$  Reporting organizations: In-Kind Services from CRBC, CSWCD, Metro

# 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 within the Clackamas River Basin.

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 2017, Clackamas Meeting featured highlights of activities for several CRISP partners underway in the Clackamas River Basin.

The Clackamas River Basin Council presented on their weed control and restoration efforts initiated through their Shade Our Streams program. These activities are one of the foundational pieces of the CRISP outreach to private landowners.



Figure 13. CRISP and 4-County CWMA partners discussing invasive weed and restoration efforts underway in Clackamas the Clackamas River Basin.

Urban weed control efforts were also highlighted by Columbia Land Trust's Backyard Habitat Certification Program, which provides assistance to urban landowner dealing with invasive species issues.

Jeff Lesh, Clackamas SWCD WeedWise specialist, provided an overview of the notable priority weeds in Clackamas County. Many of these notable observations were either discovered or informed by CRISP-related efforts.

Also at the Clackamas General meeting, CRISP Specialist, Lindsey Karr gave an overview of CRISP-led surveys in the upper portions of the Clackamas River Basin. These early detection surveys were a great example of prioritizing efforts based on introduction risks.

The 4-County CWMA Mapping and Data subcommittee 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.

The 4- County CWMA also recently published a series of Best Management Practices guides developed in Cooperation with the Columbia Gorge CWMA. These guide outline control methods for 10 invasive weeds, and have been made to CWMA partners for use within their own organizations. Additional BMPs are anticipated in 2018.

# 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 2017.



Figure 14. False brome is a significant invader being managed by BLM throughout its management areas..

BLM properties near River Island along the Clackamas 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 for the development of an Environmental Assessment that will allow them to treat invasive weeds that do not current 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 related to high quality natural areas in the Eagle Creek sub-basin.

In addition to active weed management efforts, the Bureau of Land Management- Northwest Oregon District also provided funding to support the CRISP dedicated WeedWise Specialist for coordination and implementation of the Clackamas River Invasive Species 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 the last year, priority weed control efforts on County properties have been carried out in cooperation with other CRISP partners including Metro, Clackamas River Basin Council, and Clackamas SWCD. Areas of particular interest within the targeted demonstration areas include ongoing weed control efforts at Barton Park and Fisherman's Bend. Metro has been doing restoration and weed treatments at Barton Park since 2014, in conjunction with their work at River Island Natural Area (2017 work detailed under Metro's contributions). At Fisherman's Bend, Clackamas SWCD continued treating garlic mustard across the entire site, while CRBC controlled weeds in the 100 foot riparian buffer to maintain and protect their prior restoration project at that site.

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



Figure 15. Barton Park is one of the parks under active management within the targeted demonstration areas, and is a primary focus for mangaement due to its popularity and proximity to CRISP partner project areas.

Clackamas County Parks also works with the County Dumpstoppers program to address illegal garbage and refuse dumping on public lands. These dump sites have been identified as likely introduction points for new invasive weeds into areas throughout the watershed. Clackamas County Parks has provided Clackamas SWCD with location information for common dumpsites to assist in survey and control work in the upper watershed, which is planned for survey in 2018.

## 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 example, in the 2017-18 fiscal year, the RiverHealth Stewardship Program funded 14 projects to treat weeds on approximately 25 acres, along approximately 11,000 linear feet of streams.

One WES-led project of note is the 15-acre Carli Creek project, a constructed wetland for storm water treatment. Invasive weed treatments are ongoing and will continue over the coming years to maintain the project after implementation. CRISP partners from NCRPD and Clackamas SWCD have assisted with the Carli Creek project by reviewing specific invasive weed control prescriptions. As this project continues to develop, additional efforts are under consideration as a potential CRISP project.

WES is also engaged in ongoing maintenance on the Rock Creek confluence site in conjunction



Figure 16. WES and other members of the Rock Creek Partnership hosted a Discover Rock Creek event to educate local residents about weed control and restoration efforts.

with the Rock Creek Partnership comprised of WES, CRBC, Dig In Community, 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 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 lower Clackamas River and its tributaries are important streams which provide critical anadromous fish migration, spawning, and rearing habitat for federally-listed threatened and endangered species of coho salmon, Chinook salmon, and winter steelhead. Riparian vegetation and floodplain forests provide essential habitat for the aquatic systems that support these fish species by shading streams, contributing woody debris that provides cover and deep pools for fish, and supplying important nutrients.



Figure 17. Knotweed is a major focus of Clackamas River Basin Council's Shade Our Streams program.

Unfortunately, these lower Clackamas riparian areas are threatened by invasive plant species that replace healthy floodplain forests, limit stream shade, and reduce bank stability. A key limiting factor to fish species in the lower Clackamas listed in the Clackamas River Basin Action Plan is "the loss of riparian vegetation function caused by land clearing and subsequent pressure from invasive species."

The Clackamas River Basin Council has been in the forefront of invasive weed Identification and treatment in the Clackamas River Basin since 1997. The council has been particularly effective in treating weeds in riparian areas since the inception of the Shade Our Streams program in 2010.

The Shade Our Streams tributary shading program, with a focus downstream of River Mill Dam to the mouth of the Clackamas, will result in *30 streamside miles of weeds treated* and replaced with riparian forest by 2020. The overall program includes an outreach campaign designed to recruit eligible landowners, provide ongoing additional stewardship information to current participants, and educate basin residents about the benefits of removing invasive weeds and planting native trees and shrubs.

The areas planted are concentrated either in areas with high restoration need, or riparian sites up to 100 feet from the stream bank that lack sufficient canopy cover. These areas often encompass high concentrations of invasive weeds. Site areas are prepared by removing invasive species, and then planted with a high density of native plant species. Sites are maintained to ensure permanent weed control in the area and successful native tree and shrub growth. Over the course of their involvement in the Shade Our Streams program, each property is treated for weeds an average of *14 times*. The Clackamas River Basin Council is excited to be a part of the CRISP collaborative process that has included detailed management planning and coordination with ongoing projects such as the Shade Our Streams program. Not only does CRISP target and restore riparian areas not already being managed, it will work to protect the investment of the Shade Our Streams properties by reducing future invasive species threats in the lower basin.

CRBC, through the Shade Our Streams program, has enrolled a total of 166 taxlot landowners and has removed a total of 321 acres of weeds to date.

In 2017, CRBC:

- Sent 1,000 landowner mailers to potential participants,
- Held 93 active site access permissions,
- Surveyed 13 potential CRISP properties totaling 58 acres,
- Actively treated 274 acres for weeds,
- Identified ten dominant weed species for treatment: knotweed species (Fallopia japonica, Fallopia sachalinensis, Fallopia xbohemica), Himalayan blackberry (Rubus armeniacus), reed canarygrass (Phalaris arundinacea), English ivy (Hedera helix), old man's beard (Clematis vitalba), Japanese butterbur (Petasites japonicus), lesser celandine (Ranunculus ficaria), false brome (Brachypodium sylvaticum), policeman's helmet (Impatiens glandulifera), and yellow flag iris (Iris pseudacorus).
- Shared 400 pieces of educational information to active participants

Total monetary resources expended in 2017 for Shade Our Streams and CRISP:

- Contracted resources \$147,897.00
- Total expended monetary resources in 2017 including contracted resources -\$158,589.93

CRBC looks forward to expanding their work with the CRISP project in additional priority areas in the Clackamas Watershed.

In 2018 CRBC will:

- Begin weed treatments on an additional 281 acres of additional Shade Our Streams program properties,
- Perform directed knotweed and other noxious weed outreach to Deep Creek landowners for an additional 3.9 contiguous downstream miles or 50 acres,
- Include additional weed treatments at all new project sites within CRISP priority areas.



*Figure 18.* CRBC has treated English ivy, among other invasive weeds, at riparian properties like this one. Ivy crowds out native plants and causes trees to topple.

# 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 as well as through the Conservation District's *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/wee ds).

In 2017, 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*.

In 2017, the Clackamas SWCD continued its focus on education and outreach to support CRISP. In cooperation with staff from CRBC and Metro, Clackamas SWCD distributed a press release announcing the partnership through the signing of the CRISP MOU. The WeedWise program also gave presentations to weed control professionals at the *Washington State* 



Figure 19. WeedWise contract crews controlling garlic mustard (Alliaria petiolata) in a riparian gallery forest. Garlic mustard is a highly invasive weed. Through CRISP, Clackamas SWCD has been able to significantly increase control efforts for this plant.

Noxious Weed Coordinator's Conference, and at the spring 4-County CWMA meeting in Clackamas County. Both of these events focused on highlighting the partnership and prioritization efforts. 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 979 letters to private landowners within the targeted demonstration areas, as well as private landowners along Clackamas tributaries, and others in close proximity to known priority weed locations. These letters resulted in 137 new landowner permissions, which allowed Clackamas SWCD to find new weed observations and begin new weed treatments.



Figure 20. Clackamas SWCD staff controlling false brome on a decommissioned road near the Collawash River. Without the upper watershed surveys, this population would have gone undetected.

Notable activities in 2017 undertaken by the Clackamas SWCD WeedWise program within the Clackamas River Basin include:

- Carried out upper watershed surveys at 277 locations with a focus on trailheads, campgrounds, quarries, and decommissioned roads. These surveys identified new infestations of false brome, knapweeds, houndstongue, knotweed, and a new species to Oregon, European hawkweed, (*Hieracium sabaudum*),
- Carried out 247 invasive weed control treatments at 131 different sites, with total gross size of 243 treated acres and a net infested size of 18.5 acres,
- Treated knotweed on 51 knotweed sites on the Clackamas River upstream from Richardson Creek, in the Eagle Creek Basin, and along Middle/Upper Clear Creek
- Treated garlic mustard on 55 sites,
- Treated many other weeds: spurge laurel (21 sites), policeman's helmet (12 sites), false brome (11 sites around Milo Mclver), purple loosestrife (8 sites), oblong spurge (8 sites), sulfur cinquefoil (5 sites), giant hogweed (1 site), orange hawkweed (2 sites), goatsrue (2 sites), and milk thistle (1 site).
- Surveyed 196 sites in the lower watershed for a total of 2196 surveyed acres across the entire basin.
- Maintained a total of 18442 weed observations within the basin for 222 invasive weed species, adding 3935 new observations in 2017 alone.
- Maintained 534 active permissions with private landowners,
- Invested 555 hours of total staff time on CRISP related activities,
- Spent a total of \$127,315 on contracted services inside the Clackamas Basin (\$71,725 on CRISP-approved projects

and \$55,590 on in-kind contributions towards contracted services).

## Columbia Land Trust

The Columbia Land Trust joined the CRISP in late 2017. CLT 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 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 site, 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. For at least 5 years, the Clackamas SWCD has partnered with the Land Trust to track and control weeds at both sites.



*Figure 21* The Columbia Land Trust owns the McGahan site, a 23-acre riparian and upland property.

In 2017, weed monitoring and control continued across the 23-acre McGahan site. Target species included false brome (*Alliaria petiolata*), spurge laurel (*Daphne laureola*), ivy (*Hedera hibernica*; *H. helix*), yellow archangel (*Lamiastrum galeobdolon*), English holly (*Ilex aquifolium*), Armenian blackberry (*Rubus*  *armeniacus*) and empress tree (*Paulownia tomentosa*). A total of 160 native trees and shrubs were planted to revegetate a 0.3-acre area along the property boundary where invasive weeds have been successfully controlled.

### Metro

Building on the accomplishments of previous years, Metro controlled a variety of invasive weeds across its properties in 2017. In the Clackamas Basin, extensive weed management sites included Bakers Ferry, Barton Natural Area, Cazadero, Cazadero North, Clackamas Bluffs, Clear Creek Canyon, Clear Creek North, Jonsson Center, Deep Creek North Fork, Deep Creek North Fork Forest, North Logan, Richardson Creek, River Island Natural Areas, and Clackamas County's Barton Park.

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 2017 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 2017, Metro initiated the following activities:

- 14 properties surveyed and treated
- 1,652 total site acres under management (including Barton Park weed management)
- Over 25 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), purple loosestrife (Lythrum salicaria), reed canary grass (Phalaris arundinacea), Scotch broom (Cytisus scoparius), spurge laurel (Daphne laureola), thistles (Cirsium sp.), 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 300 staff hours invested
- Invasive control utilizing eight contractors, with receipts totaling over \$140,555
- Native plantings and plant maintenance utilizing nine contractors, with receipts

totaling over \$247,000

\$30,000 in Metro CRISP cash match

Additional notes of interest:

- Metro planted over 350,000 plants at 14 Clackamas River sites in 2017
- Knotweed infestations at a maintenance level on main stem of Clackamas and Clear Creek sites

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*, eradicated)
- 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*), purple loosestrife (*Lythrum salicaria*),



Figure 22. Metro planted over 350,000 plants on the 14 Clackamas River sites in 2017.

poison hemlock (*Conium maculatum*), Italian arum (*A. italicum*)

Site wide: false brome (*Brachypodium* sylvaticum), periwinkle (*Vinca* sp.) knotweed (*Fallopia japonica, F.* sachalinensis, and F. × bohemica), butterfly bush (*Buddleja davidii*), spurge laurel (*Daphne laureola*), old man's beard (*Clematis vitalba*), periwinkle (*Vinca* sp.), ivy (*Hedera hibernica & H.* helix), Scotch broom (*Cytisus scoparius*)

#### 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)



Figure 23 Knotweed infestation prior to treatment. Infestation levels are significantly decreasing in treatment areas while consistent monitoring helps to identify additional populations establishing in riparian areas.

#### Clear Creek Canyon

- EDRR: knotweed (Fallopia japonica, F. sachalinensis, and F. × bohemica),
   Yellow arch angel (Lamiastrum 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)
- 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*)

#### Cazadero North

- EDRR: yellow flag iris (*Iris pseudacorus*)manual removal of yellow flag along stream
- Site Wide: teasel (Dipsacus fullonum) still present

#### Deep Creek North Fork

- EDRR: knotweed (Fallopia japonica, F. sachalinensis, and F. × bohemica) and Italian arum (Arum italicum), 2016 and prior treatments of knotweed along stream have resulted in significant reduction in the number of plants found during the 2017 season. 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.), English

# Minnear (Deep Creek North Fork) new acquisition

Site wide: lemon balm (*Melissa* officinalis), blackberry (*Rubus spp.*), scotch broom (*Cytisus scoparius*), holly (*Illex aquifolium*), ivy (*Hedera hibernica* & *H. helix*), tansy (*Senecio jacobaea*), vinca (*Vinca minor*), old man's beard (*Clematis vitalba*).

#### Deep Creek North Fork Forest (Paola)

• Site Wide: blackberry (*Rubus spp*.), holly (*Illex aquifolium*), lemon balm (*Melissa officinalis*), vinca (*Vinca spp*.), ivy (*Hedera hibernica & H. helix*)



Figure 24. Goose Creek - Metro continues weed control efforts at River Island after the large restoration project completion in the summer of 2017.

holly (*Ilex aquifolium*), old man's beard (*Clematis vitalba*), and black locust (*Robinia pseudoacacia*). During the winter 2017/2018 follow-up treatment, successes were observed throughout the site. Only small resprouts and a few small skips were found.

#### Jonsson Center

- EDRR: yellow arch angel (Lamiastrum 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),
- 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 (North side of river)

- EDRR: knotweed (Fallopia japonica, F. sachalinensis, and F. × bohemica), garlic mustard (Alliaria petiolata), meadow knapweed (Centaurea × moncktonii), purple loosestrife (Lythrum salicaria)
- Site wide: false brome (*Brachypodium* sylvaticum), butterfly bush (*Buddleja* davidii), Scotch broom (*Cytisus* scoparius)

#### River Island (South side of river)

• EDRR: knotweed (Fallopia japonica, F. sachalinensis, and F. × bohemica),

Italian arum (*Arum italicum*), garlic mustard (*Alliaria petiolata*), meadow knapweed (*Centaurea × moncktonii*, close to eradication), lesser celandine (*Ranunculus ficaria*, close to eradication), poison hemlock (*Conium maculatum*), purple loosestrife (*Lythrum salicaria*)

 Site wide: false brome (*Brachypodium* sylvaticum), butterfly bush (*Buddleja* davidii), Scotch broom (*Cytisus* scoparius)

## 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 CRISPrelated implementation.

In 2017, NRCS treated 256 acres for invasive weeds and designated \$36,800 for these treatments. This included forested and crop lands in both Clackamas and Multnomah Counties.

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.



Figure 25 NCPRD natural areas manager, Tonia Williamason, discusses restoration activities at the Fisherman's Bend project site.

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 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 responsibilities at the state level, ODA implements weed control within the Clackamas River Basin on behalf of the Mt Hood National Forest. On the Clackamas Ranger District, ODA has focused primarily on emergent threats in the upper portions of the watershed.

In 2017, within the Clackamas River Basin the Oregon Department of Agriculture treated over 700 gross acres of noxious weeds including:

- 710 gross acres (1/2 net) of spotted knapweed (*Centaurea stoebe*),
- 5 gross acres (1/5 net) of sulfur cinquefoil (*Potentilla recta*),
- 4 gross acres (1/8 net) of false brome (*Brachypodium sylvaticum*),

 11 gross acres (less than 1/10 net) of Japanese knotweed (*Fallopia japonica*).



Figure 26. ODA Integrated Weed Management Coordinator, Beth Myers-Shenai, assists with control of giant hogweed.

# 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 Mclver State Park has been identified as the upstreammost 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 2017 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 preemergent herbicide in certain areas.

Garlic mustard is the second priority species that was targeted in 2017, 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 2017, 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 MHNF during 2017 (Table 2-1). 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 MHNF and Columbia River Gorge National Scenic Area (2008), including use of approved herbicides only. PGE and the contractor coordinated with the MHNF botanist prior to the work. PGE also conducted routine invasive non-native control work at facilities sites on

PGE land outside of the MHNF.

An invasive non-native plant inventory was completed in 2017 as required every three years under PGE's Clackamas Hydro Project Vegetation Management Plan. Pacific Crest Consulting completed surveys of all highprobability areas within the project boundary



Figure 27. PGE staff inspect weed control effectiveness at a local quarry to prevent the introduction of invasive weeds for use on the Mt. Hood National Forest.

during August-November. 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.

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 5year 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 (eight sites) and related monitoring (12 sites) during 2017 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.

Site	2	Activity	Date	Description <sup>1</sup>
Canyon Creek Trestle		Weed Control	8/28	Pulled 85 HYPE, 15 CYSC landing, 3 CYSC
Cripple Creek		Weed Survey		Checked BRSY patch
Davis Ranch Wetland		Weed Survey		Scattered LALA, CIVU, CIAR
Frog Lake		Weed Control	6/19	Herbicide treatment
Lake Harriet		Weed Survey	12/7	Lake Harriet shoreline along rd.
Lake Harriet Minimum F	low & Small Turbine	Weed Survey	9/1	Several HYPE found
Milepost 35/Moore Cree	ek River Access	ıtrol	18, 6/19	GERO and GELU around parking lot, CYSC along HWY. Herbicide treatment.
Milepost 41/Hole in the	Wall River Access	Weed Survey & Control	6/13	Pulled 40 CYSC, 15 CIAR, 10 CIVU
North Fork Wetland		Weed Survey & Control	5/18, 7/7	Scattered CYSC, GERO patch below dam. Herbicide treatment
Pint Creek Trestle		Weed Control	8/28	Pulled many HYPE in 300 sq ft area under trestle
Sandstone Bridge		Weed survey & Control	6/7	GERO adjacent to upper parking and along roadsides. RUAR patch and CIVU at road intersection.
Timothy Lake – Cove Da	y Use	Weed Survey	9/13	Scattered HYPE
Timothy Lake – Group C	ampground	Weed Survey	9/13	Scattered HYPE, a few CIVU
Timothy Lake - Meditation Point	Weed Survey	9/27	Several CIVU	
Timothy Lake - North Arm CG	Weed Survey	9/27	Scattered HYPE	
Timothy Lake - Pale blue-eyed grass	Weed Control	9/6	Pulled ~250 HYPE	
Timothy Lake - Pine Point CG/DU	Weed Control	9/27	Pulled several CIVU, H	YPE
Timothy Lake - West Shore Day Use	Weed Control	9/13	Pulled 1 CIVU, cut 1 RL	JAR, pulled ~ 20 GERO from parking island.
Project-wide	Weed Inventory	Aug-Nov	Inventory of all areas with high probability for containing invasive non-native plants.	

Figure 28. Summary of PGE invasive non-native plant survey and control activities on the MHNF, 2017.

# United States Forest Service-Mt Hood National Forest

The US Forest Service carries out a variety of invasive weed management activities on the Mt Hood National Forest (MHNF). The MHNF works in cooperation with a number of partners to carry out weed control efforts across the national forest.

Invasive plant management is a high priority for the MHNF. In 2017, the MHNF expended \$350,000 on invasive plant management. Roughly half of that amount went to the east side of the forest and the other half to the west side. The east side includes the Hood River and Barlow Ranger Districts, and the west side includes the Zigzag and Clackamas River Ranger Districts. The funding comes from a number of sources including:

- Pacific Northwest Regional Office (RO)
- for the U.S. Forest Service,
- Title II Payco funds,
- Retained receipts from projects with Clackamas Stewardship Partners,

• Knutson-Vandenberg (KV) funds from traditional timber sales as well as stewardship projects.

Priority weed control activities on the National Forest are carried out in cooperation with the Oregon Department of Agriculture - Noxious Weed Control Program. In 2017, these treatments equated to over 700 gross acres of noxious weed control in the Clackamas River Basin targeting:

- spotted knapweed (Centaurea stoebe),
- sulfur cinquefoil (Potentilla recta),
- false brome (Brachypodium sylvaticum),
- Japanese knotweed (Fallopia japonica).

Priority weed control activities on the MHNF were also undertaken with assistance from partners in the Mt Hood National Forest Working Group, including ODA noxious Weed Control.

In addition to work carried out by ODA and the Mt Hood National Forest Working Group, the Oregon Department of Transportation (ODOT) also treats invasive weeds along Highway 224



Figure 29. The Mt. Hood National Forest hosted an Early Detection, Reporting, and Identification workshop in cooperation with the Pacific Northwest Invasive Plants Council and Clackamas SWCD to train the general public and agency partners to identify and report priority invasive weeds.

running through the MHNF. ODOT treats the highway right-of-way every year, but coordinates with the MHNF to ensure compliance with regulations from the invasive plant FEIS (2007) on herbicide and adjuvants authorized for use on the Mt. Hood National Forest, timing of application, and distance from water bodies.

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 PGE 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. In 2016, the MHNF 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.

# 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 2017. 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!

