2016

Clackamas River Invasive Species Partnership: Annual Report

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

CRISP

Clackamas River Invasive Species Partnership

Acknowledgements

This annual report has been developed on behalf of the *Clackamas River Invasive Species Partnership* (CRISP). In 2016, the collective efforts of CRISP and its participating organizations made genuine progress toward protecting the Clackamas River Basin from the ongoing threat from invasive species. On behalf of CRISP, we would like to acknowledge the many contributions of our participating and funding organizations, as well as to their dedicated staff that 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*
- *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 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

Defining the Problem

The Clackamas River Invasive Species Partnership (CRISP) was developed in response to the growing impact 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 assessing the current state of the basin, the CRISP recognizes that significant resources are already being invested to improve conditions in the Clackamas River Basin. While such investments are often focused on individual properties, their potential benefits across the broader landscape are rarely realized due to a lack of coordination and inconsistent management across ownership boundaries.

The CRISP is working to address these shortcomings by improving coordination between partners and addressing gaps in management across the landscape. The CRISP also seeks to improve effectiveness by focusing on priority weed infestations that pose the greatest threat to the watershed.

Finding Solutions

In 2016, the CRISP kicked off its activities by increasing cooperative efforts outlined in our *Clackamas River Invasive Species Management Plan*. CRISP partners have increased dialogue regarding current activities and have begun to reframe their work within the context of landscape-scale management and to work across borders and boundaries. The partners have also begun to address management gaps on both public and private lands resulting from limited staffing and financial resources.

Taking Action

To address existing gaps, the CRISP sought funding to treat invasive weeds within the Clackamas River Basin. In 2016, the CRISP secured $431,250 in grant funding through the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* to support implementation over the next five years. CRISP partners committed an additional $746,000 in cash and in-kind contributions to support these activities.

Although the grant resources were unavailable until late in the 2016 field season, CRISP partners reported expending $448,850 in contracted weed control and restoration services in 2016. The total estimated CRISP-related activities reported by partners in 2016 totaled $737,608[1]. This work supported weed management and related activities on 2,836 acres of public and private land.

With many of the gaps in management occurring on private lands, CRISP partners increased outreach to private landowners to increase management of priority weeds. In 2016, CRISP reached out to 1,374 private landowners.

Growing the Partnership

[1] Contracted services and partner expenditures should be considered to be highly conservative with only four of the thirteen CRISP participating organizations reporting expenditures in 2016.

In 2016, the CRISP grew from its origin as an advisory group supporting the *Clackamas River Invasive Species Management Plan* development effort. This transformation to a partnership required development of basic infrastructure to support the partnership and its goals and activities. Adoption of a new *Memorandum of Understanding* (MOU) outlining the partnerships goals and structure is currently circulating for signature by CRISP member organizations.

To further enhance implementation efforts in the basin the Clackamas SWCD hired a specialist to assist with implementation of CRISP-related activities. This CRISP specialist supports activities between partners and in identified gaps in management. This position was filled in mid-December 2016 and will support the partnership moving forward into the five-year grant-funded implementation cycle.

The Clackamas SWCD issued a Request for Proposals (RFP) for weed control and restoration activities and established contracts with 11 contractors to support the work of CRISP partners.

Looking Ahead

The past year has proven to be highly productive for the CRISP. In 2017, the partnership is poised to build upon this success through increased cooperation and coordination. The grant funding and partner support along with the addition of dedicated staff and contractors will allow CRISP to better address resource limitations and management gaps.

Although these resources will greatly increase the capacity of the CRISP, success ultimately depends upon the ongoing participation and engagement of the partnership. Fortunately, the accomplishments of CRISP in 2016 demonstrate tangible results. We look forward to building upon our accomplishments and to supporting a healthier Clackamas River Basin in 2017.

Introduction

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 a Technical 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, organizations participating in the Technical Advisory Group were invited to formally join CRISP. Since that time, CRISP has grown to include 13 participating organizations, representing broad interests from 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;

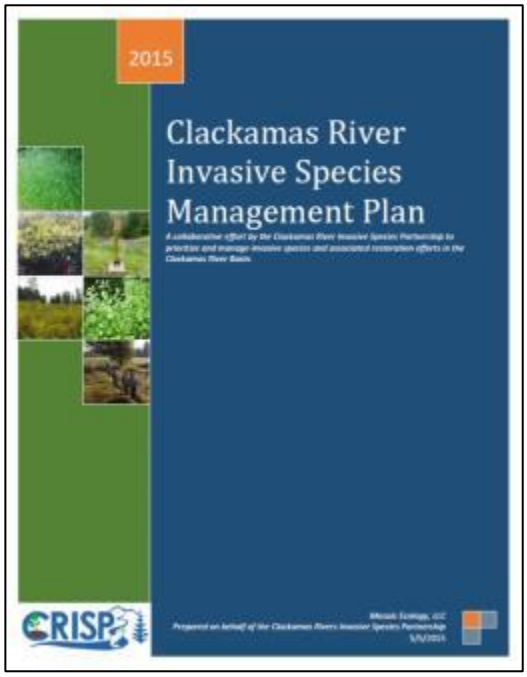

Figure 1. Clackamas River Invasive Species Management Plan was completed in 2015

- 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, 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 annual report documents the approach, activities, and accomplishments of CRISP participating organizations in this first year following completion of the *Clackamas River Invasive Species Management Plan*. 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

Figure 2. Location of the Clackamas River Basin in Oregon

than 300,000 people and contains three large dams that provide electricity, water storage, and flood control.

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 leading to an increase in water temperatures and an increase 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)[2].

Figure 3. Threatened and endangered species like white rock larkspur (Delphinium leucophaeum) are under continued threat from Invasive species.

[2] 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 bifrons*), and Japanese knotweed (*Fallopia japonica*).

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 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)[3]. 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.

[3] 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.

Figure 4. Invasive climbing vines like Englsih ivy (Hedera helix) and old man's beard (Clematis vitalba) threaten riparian forests.

Similarly, the cost of conducting forestry activities has increased greatly 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)[1]. 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 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.

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

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. 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, 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 should 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 re-colonization by invasive species and is typically necessary when a site will not naturally recover following invasive species removal.

Restoration efforts should be 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.

Geographic Prioritization

The *Clackamas River Invasive Species Management Plan* applies to the entire

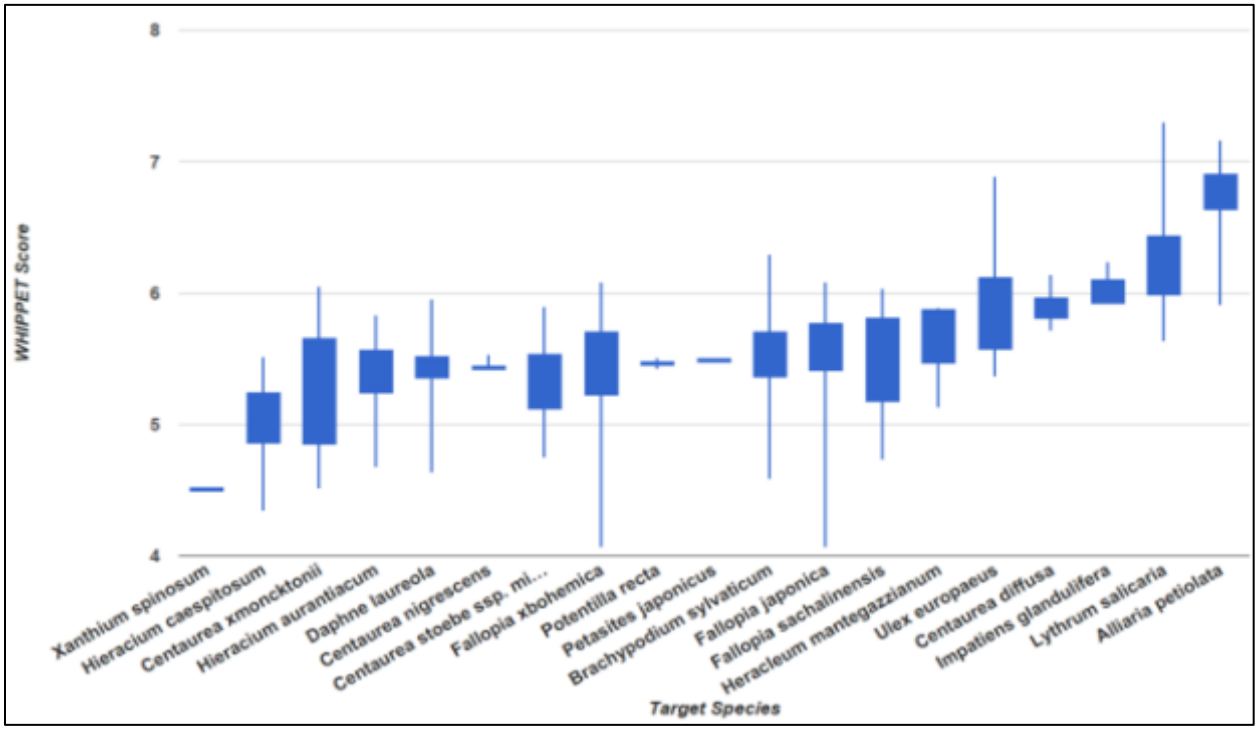

Figure 7. WHIPPET model score distributions for 19 target species evaluated.

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,
- existing partner participation,
- rare, threatened and endangered species
- 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 four smaller 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).

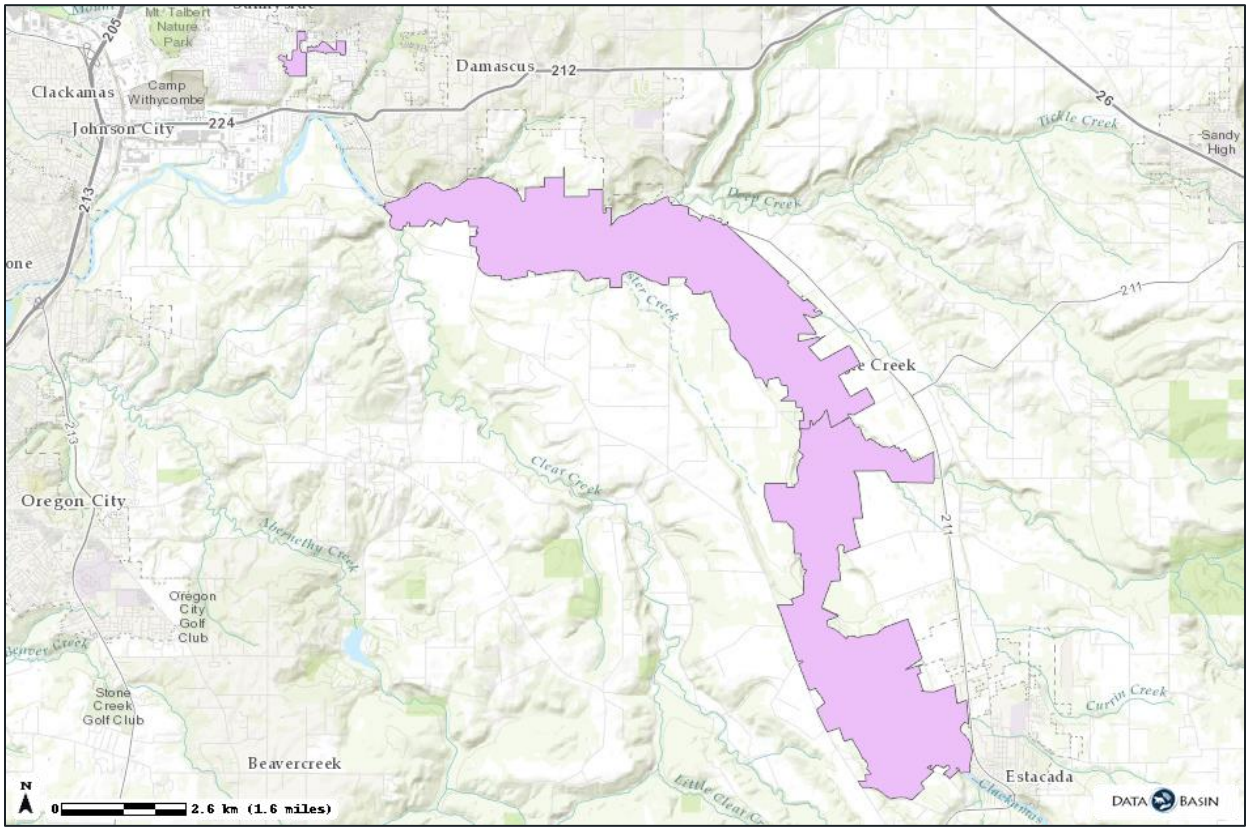

Figure 8. The 2016 CRISP targeted demonstration areas in the Clackamas River Basin.

Accomplishments

In 2016, the first implementation year since completion of the *Clackamas River Invasive Species Management Plan*, there has been a groundswell of interest and support for the partnership. At the partnership level, our focus has been on building capacity and infrastructure to solidify the partnership and secure resources to implement the management plan.

At the individual organization level, an immense amount of work has been undertaken within the watershed 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.

Memorandum of Understanding

To help support implementation of the *Clackamas River Invasive Species Management Plan* staff from Clackamas SWCD and Metro began working on a Draft Memorandum of Understanding (MOU) to formalize the partnership. This draft MOU was distributed to CRISP partners in late 2016. Ratification of the MOU by CRISP partners is anticipated in 2017.

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 summer 2016, CRISP convened as part of the 4-County CWMA *Field Day*. The event focused on CRISP weed control and restoration efforts. The event offered CRISP partners a chance to see the various approaches and projects that partners are implementing across the Clackamas Basin, as well as to share our approach with other partners from across the region.

In December 2016, the Clackamas SWCD hosted the winter CRISP meeting to discuss CRISP partner activities. The event was attended by 13 representatives from eight participating

Figure 9. CRISP partners convene at Metro's River Island project area for the 4-County CWMA Field Day.

organizations. The winter meeting unveiled a suite of new developments including:

- Distribution of the draft CRISP MOU;
- Update on the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund grant;*
- Introduction of the CRISP dedicated WeedWise Specialist;
- Formal election of CRISP Co-Chairs per the MOU;
- Establishment of a regular CRISP meeting schedule;
- Expansion of the targeted demonstration areas to include the mainstem Clackamas between Bonnie Lure and Barton.
- Updates from CRISP partners about 2016 activities and ongoing efforts.
- Establishment of a framework for submitting CRISP project proposals

Grants and Funding

Securing resources to support implementation of the *Clackamas River Invasive Species Management Plan* has been a primary activity undertaken in this first year.

On behalf of CRISP, the Clackamas SWCD, Clackamas River Basin Council, and Metro submitted a pre-proposal to the *National Fish and Wildlife Federation, Pulling Together Initiative*. Although we didn't advance to the final proposal stage, the exercise helped us further refine our fundraising focus.

We submitted a second proposal to the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund*. In early 2016, Clackamas SWCD learned that the CRISP proposal was awarded a grant for $431,250 for five of the ten years proposed, with an option

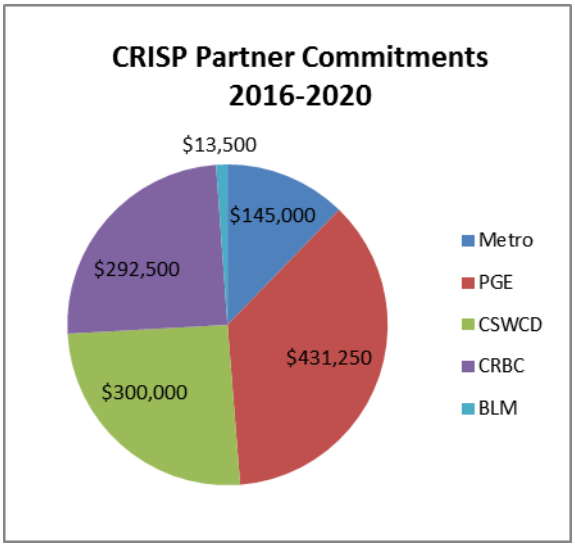

Figure 10. Current contracted grant and CRISP partner commitments through December 2020.

to reapply after the first five years. A grant agreement was finalized in August, 2016 with funds restricted to on-the-ground invasive species control efforts.

In support of this grant, several CRISP partners also committed resources to the project. Commitments included $300,000 in cash and in-kind services from the Clackamas SWCD, $292,500 of in-kind services from Clackamas River Basin Council, and $145,000 in cash and in-kind services from Metro.

In addition, BLM awarded a partner agreement to Clackamas SWCD totaling $8,500 to CRISP in 2016, which is renewable pending available funding. This agreement is part of a larger funding pool that also includes weed control efforts in Sandy River Basin as well as administration of the Columbia Gorge CWMA and 4-County CWMAs.

Plan Maintenance

The *Clackamas River Invasive Species Management Plan* was completed in 2015 and no significant changes were necessary in 2016.

Efforts were instead focused on ensuring that CRISP partners had sufficient access to key components of the management plan.

A shared online folder of CRISP plan documents was developed to ensure full access to supporting documentation. In addition, the Clackamas SWCD created a series of maps on DataBasin (https://databasin.org/) to ensure access by CRISP partners, including those who may not have access to GIS resources.

A review of the *Clackamas River Invasive Species Management Plan* is planned for winter 2017 and a working group has been established to assist in the effort.

Partner Contracting

Clackamas SWCD staff invested significant energy in developing contracts and agreements between funders and partners in 2016. This includes completing an agreement for the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* and separate agreements with Metro, PGE, and BLM. An additional agreement between Clackamas SWCD and CRBC will be finalized in 2017.

Figure 11. In 2016, WeedWise Specialist, Lindsey Karr was hired to assist with CRISP implementation.

Staffing

Following receipt of the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* grant the Clackamas SWCD issued a job announcement and position description in 2016 for a term position to support implementation of the *Clackamas River Invasive Species Management Plan*. This announcement attracted a number of qualified candidates who were interviewed by the Clackamas SWCD and participating CRISP partners. In December 2016, the Clackamas SWCD hired WeedWise Specialist Lindsey Karr to assist with implementation of the CRISP-related activities.

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 early 2016, the Clackamas SWCD initiated a Request for Proposals (RFP) with a region-wide standard scope of work for weed control and restoration efforts.

This open and competitive procurement process resulted in contracts with 11 professional weed control and restoration contractors. Known as the Contractor Pool, these contractors will help CRISP partners streamline weed control efforts across ownership boundaries and facilitate more

effective and consistent weed management throughout the Clackamas River Basin.

Use of the contractors for non-CRISP funded projects requires a partner agreement with Clackamas SWCD and this agreement will be developed in 2017, pending additional interest by CRISP partners.

CRISP Partnership Projects

Although the CRISP partners sought to begin field projects in 2016, delays in completion of the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund* contract led to the postponement of projects in the 2016 field season. A process for proposing and implementing partner projects was distributed to CRISP partners in late 2016 and will be initiated in 2017.

Outreach

In support of the *Clackamas River Invasive Species Management Plan* the Clackamas SWCD and the Clackamas River Basin Council, on behalf of CRISP, initiated a large outreach effort to private riparian landowners within the targeted demonstration areas, as well as to private landowners adjacent to properties with high priority invasive weeds.

Landowner mailings about priority weed surveys and restoration activities went out to nearly 1,400 homes within the basin. Staff followed up with many contacts and provided technical assistance to private landowners across the Clackamas River Basin.

In addition, Clackamas SWCD issued a press release highlighting CRISP efforts and announcing the grant award from the PGE administered *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund*. The press release was also distributed to CRISP partners and published on the Clackamas SWCD website.

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

Figure 12. Contract crews preparing for knotweed control.

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 an overview and training for the Fulcrum data collection system (http://www.fulcrumapp.com/) to interested CRISP partners. Adoption of the Fulcrum system would help streamline current data management efforts within CRISP. 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 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 2016, 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 2016, CRISP partners:

- Maintained a database of location information for 14,445 weed observations from 211 species,
- Maintained active site permissions for 298 private properties[4],
- Carried out surveys on 163 sites totaling more than 2,491 acres[5],
- Treated invasive weeds on more than 160 reported sites totaling 2,836 gross acres[6],
- Carried out 425 separate landowner interactions for weed surveys, control, and technical assistance.

Although impressive, the accomplishments documented here only represent a portion of the data reported from six of our 13 CRISP participating organizations. As such these accomplishments should be considered to be highly conservative estimates of activities actually undertaken.

Partner Expenditures

In 2016, 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 528 staff hours[7]
- A total of $448,850 in contracted weed control and restoration services[8]
- A total $737,608 expended in partner personnel and contractor expenses[8]

The CRISP grant and partner based cash contributions resulted in an annualized allotment of $159,750 for personnel and contracted services to support CRISP activities.

Although much was accomplished, actual CRISP expenditures in 2016 lagged behind the allotment for the year due to delays in grant and partner contracting. The contracting delays

[4] Reporting organizations: CRBC & CSWCD

[5] Reporting organizations: CRBC, CSWCD, Metro, & PGE (site only)
[6] Reporting organizations: CRBC, CSWCD, Metro & USFS/ODA
[7] Reporting organizations: SWCD & Metro
[8] Reporting organizations CRBC, CSWCD, Metro & USFS

CRISP 2016 Allotment	
Income Source	**Amount**
Metro	$30,000
BLM	$8,500
PGE- Clackamas Fund	$86,250
CSWCD	$35,000
Total Income	**$159,750**
Expenses	**Amount**
Personnel	$1,848
Contracted Services	$62,533
Total Expense	**$64,381**
Total Income	**$159,750**
Total Expense	**$64,381**
BALANCE	**$95,369**

Figure 13. CRISP grant and partner cash allotment for 2016

also shifted the hiring date for the CRISP dedicated WeedWise Specialist to mid-December. As a result, the total 2016 expenditure of $64,381 led to a carry-over balance of $93,369 into the 2017 calendar year.

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 County Commissioner, Tootie Smith to discuss the potential of forming a weed district. There was a subsequent discussion with Commissioner Smith and the Clackamas SWCD Board of Directors to discuss the idea. 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.

Although initially promising, the viability of weed district formation has been drawn into question, as major driving forces in the Discussion have diminished. In particular, dedicated funding for weed districts was not supported by legislators and Commissioner Smith was not re-elected in 2016.

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. As such, 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 documented 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 hosts two premier events. The first is the annual *Pull Together* event to educate land managers and contractors. The 2016 event was well attended by many CRISP partner organizations and contractors. The Clackamas SWCD developed and displayed a CRISP poster at the event to highlight CRISP efforts and to raise awareness around the partnership.

The second 4-County CWMA event is the annual *Field Day,* which highlighted CRISP partner activities within the targeted demonstration

Figure 14. CRISP and 4-County CWMA partners discussing invasive species control efforts at a private landowner site.

areas. This included several private landowner projects, as well as multi-partner projects at River Island, Milo McIver, and Fisher's Bend.

CRISP partner organizations represented at *Field Day* included:

- 4-County CWMA
- Clackamas County Parks
- Clackamas River Basin Council
- Clackamas SWCD
- Metro
- Natural Resources Conservation Service
- North Clackamas Parks and Recreation District
- Oregon Parks and Recreation Department

The 4-County CWMA Mapping and Data sub-committee also provided support to CRISP partners through the development 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.

Bureau of Land Management- Northwest Oregon District (BLM)

The Bureau of Land Management- Northwest Oregon District reported several active projects in the Clackamas River Basin in 2016.

BLM currently has one active timber sale reported for the Clackamas River Basin. The potential impact of invasive weeds was assessed as required by their planning process prior to initiating the timber sale. Common weeds were observed on site, but no priority invasive weeds identified.

During harvest activities management efforts focus on preventing the introduction and spread of invasive weeds. Specific actions prescribed by the BLM include efforts to:

- Seed and mulch exposed soil using native plant species seed and sterile mulch, in order to stabilize the soil and prevent establishing invasive/non-native plant species on disturbed soil in the project area.
- Clean all ground-disturbing logging and road construction equipment to be free of off-site soil, plant parts, and seed prior to entering the project area to prevent introducing invasive and non-native plants into the project area. The BLM would require the operator to make that equipment available for BLM inspection before moving it onto the project area.
- Areas within the project area with high priority weed species would require the contractor to clean all ground-disturbing logging and road construction equipment to be free of soil, plant parts, and seed prior to leaving the project area.

An additional fish habitat project was also reported on the North Fork Clackamas River. The BLM reports:

"The primary objective of the Project was to create quality pool habitat with protective cover for federally threatened Coho salmon and winter steelhead in the North Fork Clackamas River. The Project also reconnected side channel and floodplain habitats adjacent to the North Fork Reservoir. This Project restored juvenile fish habitat by placing 4 large wood structures at locations where river processes would naturally create it if wood supply and transport processes were functioning normally. In addition they grubbed blackberry with an excavator out of about 1 acre of floodplain at the confluence of the river with the reservoir. The plan is to plant native tree seedlings there this winter. If their grant is funded, the Clackamas Watershed Council was going to plant understory vegetation."

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*.

These resources have helped to address coordination needs that are not billable against the *Clackamas River Hydroelectric Project Mitigation and Enhancement Fund*.

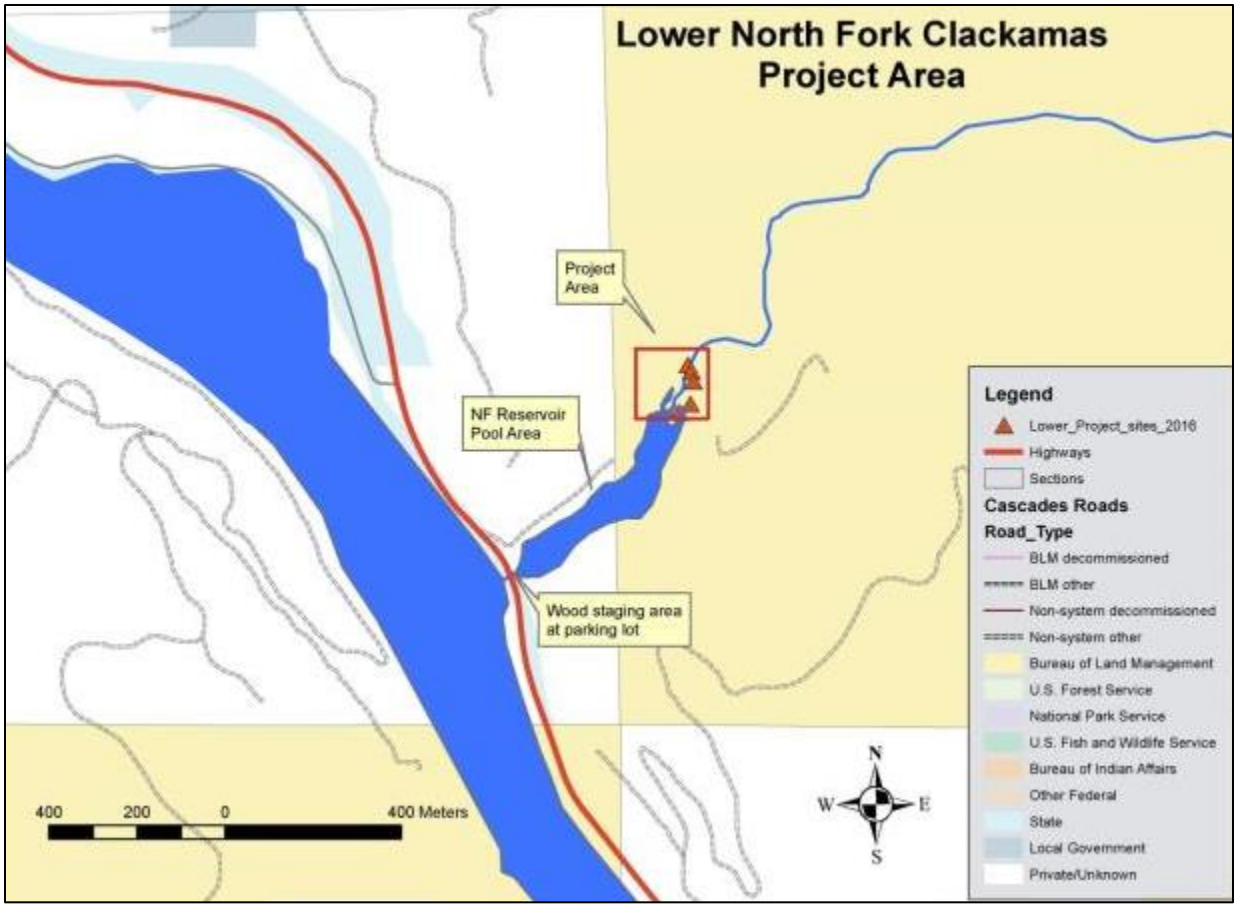

Figure 15. Vicinity map of the BLM Lower North Fork Clackamas Project Area.

Figure 16. Madrone wall is one of the parks under active management within the targeted demonstration areas.

Clackamas County - Parks

Clackamas County Parks routinely manages for 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. As such, they provide 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 have been carried out in cooperation with other CRISP partners including Metro and Clackamas SWCD. Areas of particular interest within the targeted demonstration areas include ongoing weed control efforts at Barton Park and at Madrone Wall, which is scheduled to be re-opened in 2017.

Another area of focus is Billy Goat Island, where a caretaker has been working to clear invasive weeds and revegetate the site. Work at Billy Goat Island has been undertaken in cooperation with Dig in Community.

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 in to areas throughout the watershed. Clackamas County Parks is working with Clackamas SWCD to provide location information for common dumpsites to assist in survey and control work in the upper watershed.

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, 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 2016-17 fiscal year, the RiverHealth Stewardship Program funded 16 projects that treated weeds on 14.7 acres, along 10,000 linear feet of streams within the Clackamas basin.

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 year as excavation begins.

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 with the Rock Creek Partnership comprised of WES, CRBC, Dig In Community (formerly a SOLVE program), 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 from the confluence of Rock Creek and the Clackamas River and covers 2,000 linear feet of the stream. Restoration efforts have increased*

Figure 17. 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.

stream complexity for enhanced protection for 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 the project site.

Clackamas River Basin Council (CRBC)

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

The *Shade Our Streams* tributary shading program has focused on the area from the River Mill Dam downstream to the mouth of the Clackamas. This effort will result in 30 streamside miles of weeds being 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 residents about the benefits of removing invasive weeds and planting native trees and shrubs.

The areas planted are concentrated in areas with high restoration need, or in riparian sites up to 100 feet from the stream bank and that lack sufficient canopy cover. These areas often support high concentrations of invasive weeds. Implementation sites are prepared by removing invasive species, and are then planted with a high density of native plant species. Sites are maintained for five years to ensure permanent weed control and successful native tree and shrub establishment and growth. Over the course of their enrollment in the *Shade Our Streams* program, properties are treated an average of 14 times to control invasive weeds.

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

In 2016, CRBC:

- Sent 1,000 landowner mailers to potential participants,
- Held 80 active site access permissions,
- Surveyed 13 potential properties totaling 266 acres,
- Actively treated 232 acres in riparian zones for weeds,
- Identified ten dominant weed species for treatment including:
    - Japanese Knotweed (*Fallopia japonica*),
    - Himalayan Blackberry (*Rubus bifrons*),
    - 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*),
  - Yellow Flag Iris (*Iris pseudacorus*).
- Shared 400 pieces of educational information to active participants.

Total monetary resources expended in 2016 by CRBC through their *Shade Our Streams* program:

- Contracted resources: $155,523,
- Total expended monetary resources in 2016 (including contracted resources): $404,572.

In addition to the work with Shade Our Streams CRBC has been assisting other CRISP partners with various projects across the Clackamas River Basin. These projects include sites at the Rock Creek confluence, Milo McIver, River Island, North Clear Creek, Clear Creek, Fisher's Bend, and the confluence of the Clackamas River at Meldrum Bar Park.

Figure 18. CRBC has many active projects sites underway in the basin including this side channel reconnection at Fisher's Bend within the targeted demonstration area.

CRBC is actively planning to expand work with the CRISP partnership at additional sites in the Clackamas River Basin in the coming year.

In 2017 CRBC plans to:

- Begin weed treatments on an additional 45 to 64 acres of additional *Shade Our Streams* program properties,
- Include additional weed treatments at new project sites within CRISP priority areas.

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 within the county. This weed list can be found on the WeedWise website (https://weedwise.conservationdistrict.org/weeds).

In 2016, 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 2016, the Clackamas SWCD also focused on education and outreach to support CRISP.

In cooperation with staff from CRBC and Metro, Clackamas SWCD distributed a press release announcing the CRISP partnership and the PGE funding award in fall of 2016.

Presentations were also given at the *Connect* conference sponsored by the Oregon Conservation Employees Association Conference, the *Oregon Invasive Noxious Weed Symposium*, and the *Urban Ecosystem Resource Consortium* conference to discuss the CRISP project and to highlight prioritization efforts.

The CRISP poster that Clackamas SWCD developed following completion of the *Clackamas River Invasive Species Management Plan* was displayed at several events including the 4-County CWMA *Pull-Together*, Columbia Gorge CWMA *Invasive Species and Exotic Pest Workshop*, the *Oregon Invasive Noxious Weed Symposium*, and the *Urban Ecosystem Resource Consortium* conference.

The *WeedWise* program also initiated a landowner mailing in spring 2016 targeting

Figure 19. WeedWise program manager, Sam Leininger, presents on CRISP efforts to attendees of the Oregon Interagency Noxious Weed Symposium

riparian landowners within the targeted demonstration areas, as well as private landowners in close proximity to known priority weed locations not currently enrolled in the *WeedWise* program's rapid response control effort.

Notable activities in 2016 undertaken by the Clackamas SWCD *WeedWise* program within the Clackamas River Basin include:

- Maintained 218 active permissions with private landowners,
- Mailed 374 riparian households not currently enrolled in the WeedWise program,
- Surveyed 112 parcels with total gross size of 718 acres,
- Carried out 69 invasive weed control treatments with total gross size of 907 acres and a net infested size of 45 acres,
- Maintained a total of 14,445 weed observations within the basin for 211 invasive weed species ,
- Invested 278 hours of total staff time on CRISP related activities,
- Spent a total of $15,503 on staff time on CRISP related activities,
- Spent a total of $62,533 on contracted weed control services ,
- Carried out 425 separate landowner interactions for weed surveys, control, and technical assistance
- Initiated a Request for Proposals, and an associated Scope of Work to support current weed control and restoration efforts as well as to for use in the CRISP contractor pool,
- Assisted with efforts on the Mt Hood NF with a newly established working group to focus on prevention and early detection in the upper Clackamas River Basin,
- Coordinated survey and control efforts in and around Milo McIver State Park in conjunction with Oregon Parks and Recreation Department.

Figure 20. Oblong spurge (Euphorbia oblongata) is one of the noteable new observations identified through the WeedWise program rapid response initiative in 2016.

As part of our rapid response weed control efforts, we also identified several notable weed observations within the Clackamas River Basin in 2016. These include:

- Identified and treated the largest patch of goat's rue (*Galega officinalis*) ever found Oregon,

Figure 21. WeedWise staff and contractors staging treatment of the largest goatsrue (Galega officianlis) infestation observed in Oregon.

- Identified and treated oblong spurge (*Euphorbia oblongata)* at three different properties, covering approximately five acres, located near Milo McIver State Park, near a rock quarry, and a roadside along Clackamas River Drive,
- Identified a new infestation of giant hogweed (*Heracleum mantegazzianum)* near Milo McIver State Park, which is planned for treatment by ODA ,
- Identified and treated policeman's helmet (*Impatiens glandulifera*) populations near Deep Creek and Milo McIver State Park,
- Identified and treated significant populations of garlic mustard (*Alliaria petiolata*), downstream of Milo McIver State Park,
- Identifying additional populations of weeds of concern including meadow knapweed (*Centaurea × moncktonii*), sulphur cinquefoil (*Potentilla recta*), false brome (*Brachypodium sylvaticum*), Japanese knotweed (*Fallopia japonica*), and other common weeds.

Metro

Building on the accomplishments of previous years, Metro controlled a variety of invasive weeds across its properties in 2016. In the Clackamas Basin, sites included Bakers Ferry, Barton Natural Area, Cazadero, Cazadero North, Clackamas Bluffs, Clear Creek Canyon, Clear Creek North, Jonsson Center, Deep Creek, 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 2016 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 2016, Metro initiated the following activities:

- 12 properties surveyed ,
- 12 properties treated,
- Over 52 separate weed treatment work orders,
- 1,507 total site acres under management,
- Over 22 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 250 staff hours invested,
- Seven contractors used, with receipts totaling $170,794,
- $30,000 in Metro CRISP cash match,
- $195,000 in Metro CRISP in-kind match (including estimated staff and contractor costs).

Figure 22. Metro scientist, Elaine Stewart, discusses weed control considerations when working in areas inhabitated by ground nesting turtles.

Additional notes of interest:

- Elimination of most of the mature non-native trees from Metro's Clackamas basin sites,
- Observed effective lesser celandine (*Ranunculus ficaria)* control using 1% Triclopyr, 1% Glyphosate and 1% Competitor. Using standard mixes at higher rates appears to result in top kill and a healthy flush of new growth the following year,

Figure 23. Metro and CCSWCD staff collaborate and initiate riparian surveys of invasive weeds on several islands on the Clackamas River as part of their ongoing management within the targeted demonstration areas.

- Observed increasing infestations of Italian arum (*Arum italicum*) on most of Metro sites throughout this target area and have begun trials on various mixes to see if we can identify the most effective treatment.

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.).

Barton Park (on behalf of Clackamas County)

- EDRR: garlic mustard (*Alliaria petiolata*), purple loosestrife (*Lythrum salicaria*), 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*)
- 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 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*),

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*),
- Site Wide: teasel (*Dipsacus fullonum*).

Deep Creek

- EDRR: knotweed (*Fallopia japonica, F. sachalinensis, and F. × bohemica*) and Italian arum (*Arum italicum*),
- Site Wide: ivy (*Hedera hibernica & H. helix*), periwinkle (*Vinca* sp.), English holly (*Ilex aquifolium*), old man's beard (*Clematis vitalba*), and black locust

Figure 24. River Island is just one of several properties that Metro is working on to cotnrol invasive weeds in the Clackamas Basin in 2016.

(*Robinia pseudoacacia*).

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*).

River Island North

- 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

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

In the coming year, NRCS will be focusing on livestock-related resource concerns and water quality, which can tie in an invasive weed control component when appropriate.

North Clackamas Parks and Recreation District (NCRPRD)

North Clackamas Parks and Recreation District routinely manages their property for weeds as part of their ongoing park maintenance activities. Notable parks currently under management by NCPRD within the Clackamas River Basin include Hoodview Park in Happy Valley and Trillium Creek Park in Damascus.

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.

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

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

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

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 2016, within the Clackamas River Basin the Oregon Department of Agriculture treated nearly 200 gross acres of noxious weeds including:

- 170 gross acres of spotted knapweed (*Centaurea stoebe*),
- 3 gross acres of diffuse knapweed (*Centaurea diffusa*),
- 1 gross acre of false brome (*Brachypodium sylvaticum*),
- 16 gross acres of Japanese knotweed (*Fallopia japonica*).

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. As such, control and management of these weeds are of particular importance. Other target invasives are yellow archangel, orange

Figure 27. OPRD Park Ranger, Mark Shaw, shares details of their false brome management strategy currently being employed at Milo McIver State Park.

hawkweed, English ivy and Old Man's Beard.

In 2016, OPRD also hosted a portion of the 4-County CWMA *Field Day* to help educate land managers across the region about weed control efforts, and management efforts underway at Milo McIver, particularly for false brome control.

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 2016, 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.

The activities reported by PGE in 2016 are fully summarized in their *2017 Annual Planning Memorandum for the Vegetation Management Plan*.

Select activities related to invasive non-native plant inventory, prevention and control are summarized below:

"PROJECTS ON THE MHNF IN 2016

Invasive non-native plant inventory and control

PGE staff conducted manual control and employed a licensed contractor, Nick's Timber Services, to conduct herbicide treatments of invasive non-native plants at multiple locations within the MHNF during 2016. Invasive non-native plant infestations were treated with herbicides consistent with the project design criteria in the 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 is updating GIS coverage of terrestrial invasive non-native plant infestations within the Project boundary to reflect locations of 2016 control work. In addition follow-up treatments of currently-treated infestations, a project-wide invasive non-native plant inventory is planned for 2017 (as required every three years in the VMP), and PGE will continue to coordinate with the USDA-FS on control priorities.

Revegetation and monitoring at multiple sites

Figure 28. 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.

PGE conducted revegetation and related monitoring at multiple sites during 2016 where project-related construction, recreation improvements or habitat restoration activities have created disturbed soil. Ground-disturbing projects conducted during 2016 will be monitored as applicable for revegetation success and invasive non-native plants. All sites are monitored annually for a minimum of three years to ensure revegetation success, and control measures are conducted as appropriate prevent establishment of invasive non-native plants in revegetated areas (see Section 5.0).

PROJECTS OUTSIDE THE MHNF IN 2016

Ground-disturbing projects on PGE land are revegetated consistent with guidelines in the VMP. Monitoring and control of invasive non-native plants are also conducted as required by the VMP."

In 2017, PGE will continue efforts within the watershed. These activities are also outlined in the *2017 Annual Planning Memorandum for the Vegetation Management Plan*.

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.

Summary of PGE invasive non-native plant survey and control activities on the MHNF, 2016

Subsite	Activity	Date	Description[1]
Anvil Creek Culvert	Weed Control	05/31	Pulled ~120 HYPE
Cripple Creek	Weed Survey & Control	07/05, 08/31	Herbicide treatment, false brome (7/5). No false brome found (8/31). Pulled ~12 HYPE & 3 SEJA
Davis Ranch Wetland	Weed Control	07/05, 08/05	Herbicide treatment (7/5). Invasive species data collected during wetland monitoring (8/5).
Estacada Rock Products	Weed Survey & Control	07/27, 08/27	Reviewed weed control needs for gravel sourcing (7/27). Herbicide treatment of POCU & other invasive non-natives.
Frog Lake	Weed Control	07/05	Herbicide treatment
Lake Harriet	Weed Survey & Control	08/31, 12/10	Harriet Substation, cut 6 MEOF, 20 HYPE, 6 CIVU. Roadside substation to campground, scattered HYPE, MEOF, CYSC (patch at CG entrance) (8/31). Cut 300 CYSC at campground entrance (12/1)
Lake Harriet Minimum Flow & Small Turbine	Weed Control	08/31	Cut 6 CIVU, 20 CIAR, & 1 CYSC in lower UG ROW.
Milepost 35/Moore Creek River Access	Weed Survey & Control	07/05, 08/31	Herbicide treatment (7/5). Looks good (8/31). Shiny geranium patch dead. A few CYSC and SEJA to pull/cut.
Milepost 41/Hole in the Wall River Access	Weed Survey & Control	07/05, 08/31, 12/01	Herbicide treatment (7/5). Looks good. A few CYSC on river side (8/31). Pulled 350 CYSC, 10 VIAR, & 5 CIVU in planting plot adjacent to Hwy 224 (12/1).
North Fork Wetland	Weed Survey & Control	06/15, 07/31	Herbicide treatment (6/15). Invasive species data collected during wetland monitoring (7/31)
Oak Grove pipeline and access road	Weed Control	07/05	Herbicide treatment, pipeline ROW, rd margins.
Oak Grove - Faraday Transmission ROW	Weed Survey & Control	07/05, 08/31	Herbicide treatments at transmission line ROW crossings of HWY 224 (7/5). CYSC under powerline at turn off of 224 to Three Lynx (8/31).
OG Pipeline Large Animal Crossing #6	Weed Control	08/31	Cut ~12 CIVU & cut/pulled 60 HYPE, access Rd to crossing
Pint Creek Trestle	Weed Control	07/26	Pulled 80 HYPE, end of road
Promontory Park	Weed Survey & Control	07/05, 07/21	Herbicide treatment (7/5). Pulled ~12 CIVU, 6 CIAR, 12 HYPE, & 6 SEJA in Marina plantings (7/21).
Sandstone Bridge	Weed survey & Control	08/31, 11/16	CYSC, RUAR, and GERO along rd (8/31). Pulled 6 HYPE, 6 CYSC, 10 CIVU (11/16).
Timothy Lake Lodge	Weed Control	11/07	Pulled ~200 HYPE along lodge loop road.
Timothy Lake - below dam	Weed Control	07/27, 08/10	Access road below dam. Pulled 100 HYPE, 5 CIVU, 3 SEJA (7/27). Pulled 50+ HYPE along access rd & ~25 HYPE & 200+ GERO along revegetated rd spur below hairpin turn. Still GERO patch on slope above rd. (8/10).
Timothy Lake – Cove Day Use	Weed Survey	05/31, 10/11	No invasives noted during reveg monitoring
Timothy Lake - gravel stockpile	Weed Survey & Control	07/27	No Issues. Most of ground graveled. Pulled 100 HYPE.
Timothy Lake – group campsites	Weed Survey	05/31, 09/22	No invasives noted during reveg monitoring
Timothy Lake - Meditation Point	Weed Control	09/28	Pulled 1 HYPE and 1 CIVU at site #1
Timothy Lake - North Arm CG	Weed Control	08/10	Pulled 5 CIVU in day use and walk-in areas
Timothy Lake - Pale blue-eyed grass	Weed Control	09/09	Pulled ~220 HYPE and 1 CIVU along shoreline opening west of main patch. Also 10 HYPE, 5 CIAR at shoreline at campsite
Timothy Lake - Pine Point CG/DU	Weed Control	11/07	Pulled HYPE and CIVU
Timothy Lake - West Shore Day Use	Weed Control	08/10	Pulled ~75 HYPE in day use area and ~50 along access rd (8/10). Pulled 3 stems HYPE at monitoring plot 4 (9/22).

[1]All herbicide applications were spot treatments of individual plants or defined patches of target invasive non-native species using a backpack sprayer.

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. The MHNF works in cooperation with a number of partners to carry out invasive weed control efforts across the National Forest.

Invasive plant management is a high priority for the Mt. Hood National Forest (MHNF). In 2016, the MHNF expended $240,000 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 2016, these treatments equated to nearly 200 gross acres of noxious weeds control in the Clackamas River Basin targeting:

- spotted knapweed (*Centaurea stoebe*),
- diffuse knapweed (*Centaurea diffusa*),
- false brome (*Brachypodium sylvaticum*),
- Japanese knotweed (*Fallopia japonica*).

Priority weed control activities on the MHNF

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.

were also undertaken with assistance from partners in the Mt Hood National Forest Working Group, including ODA noxious Weed Control Program, the Clackamas SWCD, and Portland Water Bureau.

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 running through the MHNF.

In 2016, ODOT treated roughly 13 miles along Highway 224 south of Estacada. Invasive species treated included Himalayan blackberry (*Rubus bifrons*), Scotch broom (*Cytisus scoparius*), St. John's wort (*Hypericum perforatu*m), tansy ragwort (*Senecio jacobaea*), herb Robert (*Geranium robertianum*), shiny leaf geranium (*Geranium lucidum*), and others.

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 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 that 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 2016. The success of 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 CRISP and for investing in the future of the Clackamas River Basin.

-***Thank You!***